GOVERNMENT OF TELANGANA
IRRIGATION & CAD DEPARTMENT

From
Sri. M.A Hameed Khan, B.E.,
Chief Engineer,
Irrigation, Nagarkurnool,
Nagarkurnool.

To
Member Secretary,
Expert Appraisal Committee (River Valley and Hydro-electric Projects),
Ministry of Environment, Forest & Climate Change (MOEF&CCC),
Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, New Delhi - 110003

Lr. No.CE(I)/NGKL/DCE/OT1/TS3/EC/08 **Dt:05.06.2023.**

Sir,

Sub:- Submission of ADS reply for the EC Proposal of 'Palamuru Rangareddy Lift Irrigation Scheme – Canal Network – Phase II (Irrigation)' (Proposal No. IA/TG/RIV/289525/2017 and File No. J-12011/31/2017-IA.I(R)) on PARIVESH Portal- Reg.

Ref:- 1. Proposal No: IA/TG/RIV/289525/2017
2. File No. J-12011/31/2017-IA.I(R)
3. ADS raised during 34th EAC Meeting held on dated 14.09.2022

****

With reference to the above mentioned subject, we would like to inform you that the proposal (Proposal No. IA/TG/RIV/289525/2017 and File No. J-12011/31/2017-IA.I(R)) was submitted online on PARIVESH portal and considered in 34th EAC Meeting held on dated 14.09.2022 at agenda item no. 34.2 for grant of Environment Clearance.

During the discussion in the EAC meeting, few observations were raised by the committee members and ADS was sought on the project. So, in view of the same, we are herewith submitting the ADS reply in line with the committee requirement.

In this regard, Member secretary, MOEF&CCC, New Delhi is requested to process our proposal for grant of Environmental Clearance to the project.

Encl: 1) Reply of ADS points raised during 34th EAC Meeting
2) Updated EIA Report

Yours faithfully,
Sd/-05.06.2023
Chief Engineer,
Irrigation, Nagarkurnool.

// Attested //

Deputy Chief Engineer(I),
Nagarkurnool

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Point wise replies to the Additional Details Sought (ADS) as per 34th EAC Meeting, MoM dated 14th of September, 2022, {Proposal No. Proposal No: IA/TG/RIV/289525/2017, & File No. J-12011/31/2017-IA. I(R)}

Point wise replies to the Additional Details Sought for Palamuru Rangareddy Lift Irrigation Scheme {Proposal No. Proposal No: IA/TG/RIV/289525/2017, & File No. J-12011/31/2017-IA. I(R)} as per 34th EAC Meeting, MoM dated 14th of September, 2022

Point wise replies to queries raised are given hereunder:

Query No.1:

The project proponent shall be required to submit a bank guarantee equivalent to the amount of remediation plan and natural and community resource augmentation plan with the SPCB prior to the grant of EC. The quantum shall be recommended by the EAC and finalized by the regulatory authority. The bank guarantee shall be released after successful implementation of the EMP, followed by recommendations of the EAC and approval of the regulatory authority.

Reply:

The Project Proponent hereby undertake to submit a bank guarantee equivalent to the amount of remediation plan and natural and community resource augmentation plan, as recommended by the EAC and finalized by the regulatory authority, with the SPCB prior to the grant of EC.

Query No.2:

Assessment of ecological damage with respect to air, water, land and other environmental attributes shall be carried out by the accredited consultant of the PP. The collection and analysis of data shall be done by an environmental laboratory duly notified under the Environment (Protection) Act, 1986, or an environmental laboratory accredited by NABL, or a laboratory of a Council of Scientific and Industrial Research (CSIR) institution working in the field of environment.

Reply:

Ecological damage assessment to various environmental attributes during the period the work under PRLIS was executed without prior EC, has been carried out within the "General Framework for imposing Environmental Damage Compensation", CPCB, December,2022, in conjunction with the methodologies from European Environmental Agency, and EU Hand Book-28.It was based on such vital information collected, which have bearing on the physical environs, construction related activities and physical quantum of work executed, use of natural resources, human resource, financial aspects, the timeframe of violation period. The detailed damage assessment of environmental attributes has been elaborated in Section13.7 and its sub section in the report. The summary of various environment damage cost (EDC) as contained in this chapter is enumerated in Table-13.26 of the report.

Table 13.26: Summary of Environmental Damage Cost

S.N.	Environment Attributes	Damage cost (Rs lakh)
1	Land Environment	
(i)	Cost Compensation due to Improper Implementation of Muck Management	520.78
(ii)	Cost Compensation due to incomplete Implementation of Green Belt	1773.40
(iii)	Cost Compensation due to Partial Management of Solid Waste	368.00

S.N.	Environment Attributes	Damage cost (Rs lakh)
5	Water Environment (Compensation for Non-Provision of STP)	155.88
6	Cost Saving from Partial Implementation of Provision Under Sanitation Plan	230.19
7	Cost Saving from Partial Implementation of Fuel Wood Saving Devices	182.24
8	Cost Saving from Partial Implementation of Provision under OHS	191.77
9	Avoidance/Substitution cost saved in respect of other EMP	2262.00
	Total	**14247.49**

Monitoring of ambient air quality, surface and ground water quality, soil quality as well as noise levels measurements were conducted at such locations like pump houses and reservoir formation, where the quantum of construction works was substantial and in concentrated area. Baseline data has been collected afresh during post-monsoon,2022, and incorporated in report under sub-sections 13.5.1 for ambient air quality (Table 13.2); sub-sections 13.5.2 for noise levels (Table 13.4); sub- sections 13.5.3 for Physical & Chemical Characteristics of Soil (Table 13.7) and sub-sections 13.5.4 for Physical & Chemical Characteristics of Surface /Ground Water (Table 13.8 and Table 13.9).

The monitoring results reveals that at all sampling location(6No.) the minimum and maximum PM10 concentration ranged between 44.2 – 57.4 µg/m³ with mean value as 51.9 µg/m³; while PM2.5 concentration ranged between 13.8 – 24.2 µg/m³ with mean value as 19.5 µg/m³. Whereas, SO2 concentrations ranged between 5.3 - 7.9 µg/m³ with mean values as 6.3 µg/m³ and & NO2 concentration ranged between 8.2 – 15.6 µg/m³ with mean value as 11.4 µg/m3 respectively. Overall, it's observed that the concentration of all the pollutants were within the NAAQS limits set forth by CPCB Notification dated 16.11. 2009.

The noise monitoring results reveal the day and night time noise level at all locations (6 No.) were within the prescribed limit. With the discontinuing of construction work of PLRIS under 18 packages, the movement and operation of noise generating construction equipment and heavy earthmovers have come to a halt and the major source of the noise in such area now is routine vehicular movement as well as rural activity.

The results of the soil analysis (6 samples) show that the soil is neutral to slightly basic at all the locations having pH varying from 7.32 to 7.56. The texture of the soil varies from loam to clay loam. Available nitrogen content ranges between 121.6 to 218.2 kg/ha thereby indicating that soils are low in available nitrogen content. Available phosphorus content ranges between 10.3 to 13.2 kg/ha) thereby indicating that soils are medium in available phosphorus. Available potassium content in the soil ranges between 200 to 249.6kg/ha, thereby indicating medium to high in potassium content. The organic carbon varies from 0.65 % to 1.24% thereby implying that soils have medium to high OC.

The pH values of all analysed surface water samples (6No.) ranged between 7.60 – 8.10 and are within the acceptable limit (6.5-8.5). The TDS levels ranged from 176 to 380mg/l and were less than the desirable limit of 500 mg/l. Total hardness levels ranged from 107 to 142 mg/l and were well below the desirable limit of 200 mg/l. The dissolved oxygen values ranged between 4.0-4.4 mg/l and were more than 4mg/l, i.e., the limit under CPCB Water Quality Criteria for designated best use (C). The chlorides level in surface water samples ranged from 30.8 -41.3 mg/l and were below the desirable limit of 250 mg/l. The sulphates level ranged from 25.3 to 34.2 mg/l and were below the desirable limit of 200 mg/l. The nitrate level in surface water samples ranged from 3.9 -6.4 mg/l and were below the acceptable limit of 45 mg/l. The fluoride level in surface water samples ranged from 0.17 -0.26 mg/l and were below the desirable limit of 1.0 mg/l. The BOD values ranged between 2.1 to 3.0 mg/l and within the CPCB criteria of 3mg/l or less for Class C water, thereby implying that the drinking water source is not suitable even after conventional

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treatment and disinfection. The Total Coliform level ranged between 290-455 MPN/100ml and were below 5000 MPN/100ml, the limits specified for Class C water under CPCB Water Quality Criteria for designated best use.

The pH values of all analysed ground water samples (8 No.) ranged between 7.15 – 7.55 and are within the acceptable limit (6.5-8.5). The TDS levels ranged from 345 to 1100mg/l and were less than the permissible limit of 2000 mg/l. Total hardness levels ranged from 169 to 658 mg/l and at one location exceeded the permissible limit of 600 mg/l. The chlorides level in surface water samples ranged from 56.2 -272.4 mg/l and were below the permissible limit of 1000 mg/l. The sulphates level ranged from 36.3 to 242.3 mg/l and were below the permissible limit of 400 mg/l. The nitrate level in surface water samples ranged from 7.6 -12.6 mg/l and were below the acceptable limit of 45 mg/l. The fluoride level in ground water samples ranged from 0.58 -0.86 mg/l and were below the desirable limit of 1.0 mg/l. The heavy metals are below their acceptable limits.

Query No.3:

The PP has to obtain clearance from inter-state aspect from the designated authorities as per Procedure.

Reply:

The DPR of PRLIS, submitted to the CWC, New Delhi on 15.09.2022, is being scrutinised in different Directorates of the CWC, New Delhi.

Query No.4:

Preparation of EMP comprising remediation plan and natural and community resource augmentation plan corresponding to the ecological damage assessed and economic benefits derived due to violation to be done.

Reply:

The EMPs for PRLIS has been prepared for both stages of work under the project and have been dwell in detail in Chapter-10 under section 10.1 through 10.21 along with apportionment of cost of each plan as capital cost and annual recurring (Table 10.63) of the report. The detailed remediation plan and the natural and community resource augmentation plan have been prepared and enumerated in Table 13.28 through Table 13.30, in Chapter-13. The consolidated cost of EMPs and remediation plan along with natural and community resource augmentation plan has been elucidated under Table13.

Net annual benefits from increased irrigation potential besides revenue from domestic water supply, industrial water supply and fisheries can accrue only after commissioning of PRLIS. Presently neither any reservoir nor any pump house and water conductor system involved in various stages of lifting is complete nor filling of any reservoir is accomplished, thus there is no profit gained during violation period.

Query No.5:

The remediation plan and the natural and community resource augmentation plan to be prepared as an independent chapter in the EIA report by the accredited consultants.

Reply:

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The remediation plan and the natural and community resource augmentation plan have been prepared and enumerated in Table 13.28 through Table 13.30, in Chapter-13 added as an independent chapter in the EIA report.

Query No.6:

Socio-Economic Study following standard procedures to be included, impacts due to project activities need to be assessed and remedial measures to be proposed based on the Field Study and issues raised during Public Hearing.

Reply:

Impacts due to project activities on various environmental attributes including socio-economic aspects have been assessed elaborately under Section Chapter-4. Nonetheless, these have been brought out in brief in section 13.10 of the report. Apart from this the gist of issues raised and the replies of the project proponent are described in **Table 7.1** through **Table 7.6** of the report. Nonetheless, the main issues raised in brief were reiterated in Section13.11. As per provision under O.M. F.No.22-65/2017-IA.III, dated 30th September,2020, concerns raised during public hearing and which were committed for addressal by the project proponent, have been included under **Section 10.19**, by earmarking Rs 4400 lakhs.

Query No.7:

As the area is on fluoride affected zone, therefore, provisions should be made to recharge the groundwater through proposed reservoirs to dilute fluoride levels.

Reply:

In study area besides some Mandals of Nalgonda few mandals of Mahbubnagar, and Ranga Reddy districts also have fluoride content above 1.5mg/l. It is pertinent to mention here that recharge due to reservoir seepage after completion of the scheme shall be 24.42MCM. Keeping in view the groundwater recharge potential in the project area accruing from implementation of project, it is proposed to construct some rainwater structures like Check dams and percolation tanks in the area. The cost of rainwater harvesting structure has been estimated as Rs 1370 lakh as elucidated in **Table 10.50** of the report.

Table 10.50: Cost of Rainwater Harvesting

S.N.	District	Check Dam		Percolation Tanks		Total cost (Rs lakh)
		Number	Cost @Rs 8 lakh each	Number	Cost @Rs 15 lakh each	
			Phase-I			
1	Nagarkurnool	10	80	6	90.00	170.00
			Phase-II			
2	Mahabubnagar	15	120	10	150.00	270.00
3	Narayanpet	10	80	4	60.00	140.00
4	Nalgonda	20	160	10	150.00	310.00
5	Rangareddy	20	160	10	150.00	310.00
6	Vikarabad	10	80	6	90	170.00
Total Phase-II		**75**	**600**	**40**	**600**	**1200.00**
Total Phase-I &II		**85**	**680**	**46**	**690**	**1370.00**

Sd/- 05.06.2023
Chief Engineer
Irrigation, Nagarkurnool

5/6/23.
Dy. Chief Engineer
Irrigation, Nagarkurnool

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Final Environmental Impact Assessment Report

PALAMURU RANGAREDDY LIFT IRRIGATION SCHEME

Section 1(c) (ii) River Valley Projects, Category "A"

GOVERNMENT OF TELANGANA
IRRIGATION AND CAD DEPARTMENT,
HYDERABAD (TS)

June, 2023

Submitted by:

Voyants Solutions Private Limited.

NABET Certificate No: NABET/EIA/1821/RA 0114
Dated: December 30, 2021, Valid till- September 14, 2024

Laboratory: Vison Labs
Study Period: Monsoon 2019, Post-Monsoon, 2019,
Pre-Monsoon 2020

DISCLOSURE OF PROJECT PROPONENT

GOVERNMENT OF TELANGANA
IRRIGATION & CAD DEPARTMENT

O/o The Chief Engineer (Irrigation)
Nagarkurnool

DECLARATION BY PROJECT PROPONENT

This is to inform that the contents (information and Data) given in the EIA report belong to our project "Palamuru Rangareddy Lift Irrigation Scheme in Telangana" only and it has not been copied from any other Environmental Impact Assessment Reports.

Authorized Signatory

31/8/2021

M A Hameed Khan
Chief Engineer (Irr)
Nagarkurnool

Date: 31.08.2021

DISCLOSURE OF CONSULTANT ENGAGED

Declaration by Experts contributing to the Environmental Impact Assessment for Palamuru Rangareddy Lift Irrigation Scheme, in Telangana.

I, Yamesh Sharma, hereby certify that I was a part of the EIA team in the following capacity that developed the above EIA.

EIA coordinator:

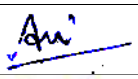
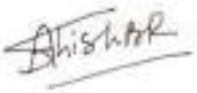
Name: Yamesh Sharma

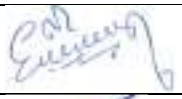
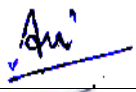
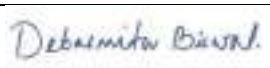
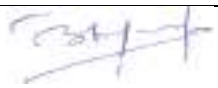
Signature:

Period of Involvement: July, 2017 till date

Contact Information: yamesh70@gmail.com

Functional area experts:

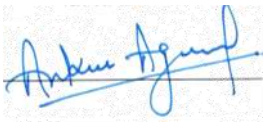
Sl. No.	Functional Areas	Name of the experts	Involvement (Period and task)	Signature and Date
1	AP	Santosh kumar Kulkarni	July 2017 - May 2022	
		Preeti Chand	Aug 2022 - till date	
2	WP	Santoshkumar Kulkarni	July 2017 - May 2022	
		Avi	Sep 2022 - Till date	
3	SHW	Dr. Rekha Singh	July 2017 - Till Date	
		Ms. Reshma Thakur	July 2017 - Till Date	
4	SE	Dhritiman Dutta	July 2017 - March, 2020	
		Kamal Singh	July 2017 - Till Date	
5	EB	Ashish Rawat	July 2017 - May 2022	
		Deepika Bisht	December 2022 - Till Date	

Sl. No.	Functional Areas	Name of the experts	Involvement (Period and task)	Signature and Date
6	HG	Yamesh Sharma	July 2017 – Till Date	
7	GEO	Dr. D C Meshram	July 2017 – Till Date	
8	SC	Yamesh Sharma	July 2017 – Till Date	
9	AQ	Santoshkumar Kulkarni	July 2017 – Till Date	
		Avi	Sep 2022 - Till date	
10	NV	Yamesh Sharma	July 2017 – Till Date	
11	LU	Debasmita Biswal	July 2017 – Till Date	
12	RH	Dr. Rekha Singh	July 2017 – May, 2020	
		Aprup Anant Adawadkar	July 2017 – Till Date	

Declaration of association in the EIA

Declaration by the Head of the accredited consultant organization/ authorized person

I, Ankur Agarwal, Asst. General Manager –EMS, hereby, confirm that the above-mentioned experts prepared the EIA of PALAMURU RANGAREDDY LIFT IRRIGATION SCHEME, in Telangana. I also confirm that the consultant organization shall be fully accountable for any mis-leading information mentioned in this statement.

Signature: 

Name: **Ankur Agarwal**

Designation: **Asst. General Manager – Environmental Management Services (EMS)**

Name of the EIA consultant organization: **Voyants Solutions Pvt. Ltd.**

NABET Certificate No. & Issue Date: **NABET/EIA/2124/RA 0223 dated December 30, 2021** valid up to **September 14, 2024**

Laboratory Involved:

Name of the Environmental Laboratory:	Vison Labs
LABL Accreditation No:	TC-5064 valid till 25.11.2023
Monitoring Period:	Monsoon 2019, Post-Monsoon, 2019, Pre-Monsoon 2020
Brief Note on Vison Labs:	VISON LABS is accredited by NABL as per ISO/IEC 17025:2005, recognized by Ministry of Environment, Forest & Climate Change (MoEFCC), Govt.of India and certified by ISO 9001: 2008 OHSAS 18001:2007. VISON LABS has specialized experience in facilities in determining quality horizons of water and waste water, materials, chemicals, food products, Ambient Air Quality Monitoring (AAQM) Stack Monitoring, and in turnkey projects of Sewage treatment Plants, Effluent Treatment Plants and in R.O. Plants (operation and maintenance).

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CHAPTER 1 INTRODUCTION AND PROJECT BACKGROUND

1.1 BACKGROUND

Telangana lies between 15° 46' and 19° 47' N latitude and 77° 16' and 81° 43' E longitude and is bordered by Maharashtra in north and north-west, Karnataka towards the west, Chhattisgarh in north-east and Andhra Pradesh in south and east.

Situated in the southern part of India, Telangana is the 29th state of India, formed on 2nd June 2014 with 1,12,077 Sq. km. of area and has a population of over 35 million. Forests occupy 24% of area, and about 43% of land is under cultivation. Ground water contributes to 75% of irrigation, while remaining using surface water. According to the agro-climatic zones, this region falls under the southern plateau and hills regions and is classified as hot semi-arid ecoregion with red and black soils as per the agro-ecological zones. As such, the climate is predominantly hot and dry. The annual average rainfall is about 906 mm, 80% of which is received from south-west monsoon.

Drainage of the state can be divided into 2 major and 11 sub-basins and over 60% of soils can be classified as red in colour. Godavari and Krishna are major rivers in the state, with around 73.5% of state's territory being covered by basin of these two rivers.

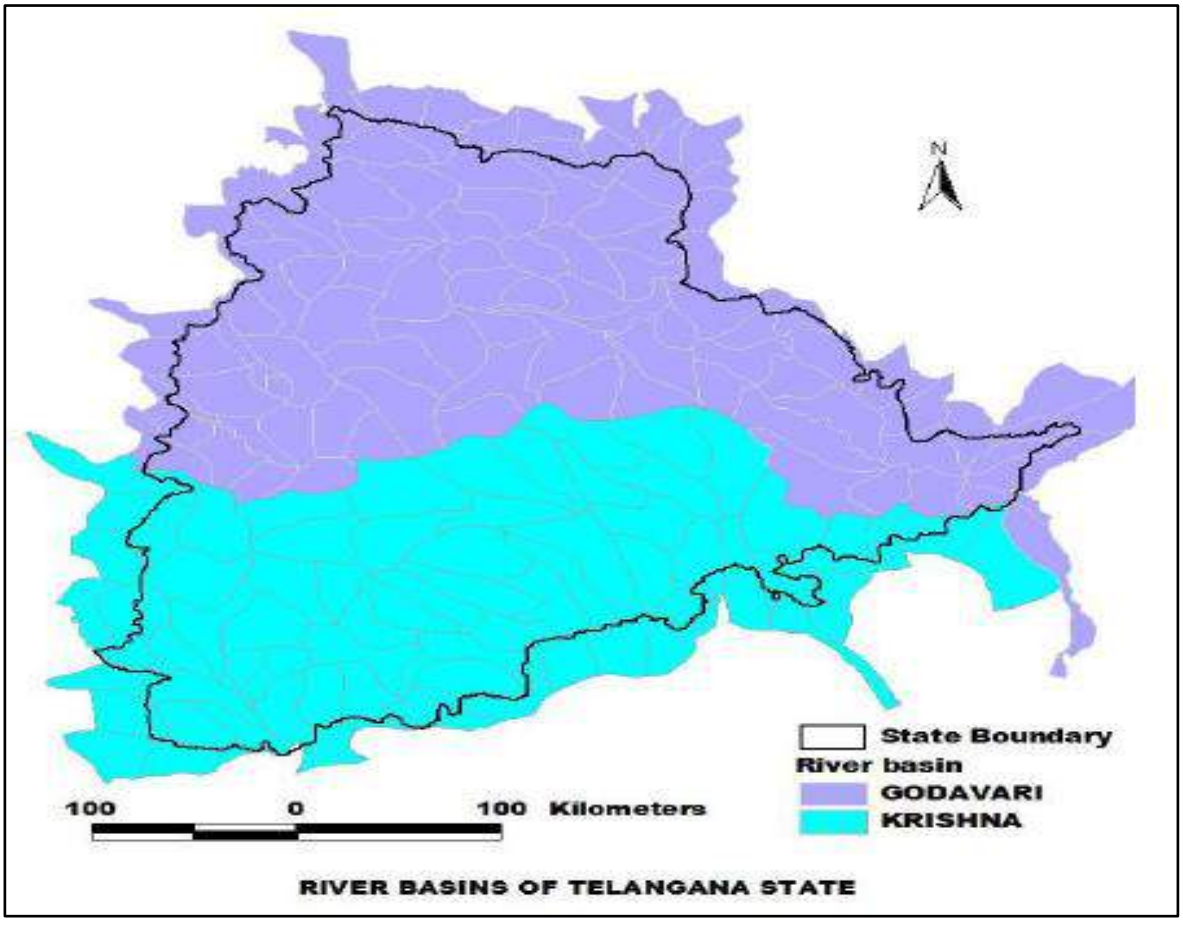


Figure 1.1: River Basins of Telangana State

Analysis of last 30 years data on drought indicates the districts of erstwhile Andhra Pradesh which after reorganisation of state are now covered in Telangana state has experienced 23 years as

droughts affected in some or other mandals. Further, non-availability of sufficient irrigation facilities and limitations with respect to ground water exploration makes Telangana State drought prone. The drought and scarcity conditions have frequently occurred in extensive areas within the Krishna Basin and particularly in several areas of Erstwhile Mahaboobnagar, Nalagonda, Hyderabad districts of Erstwhile combined Andhra Pradesh State as reported by the Indian Irrigation Commission mentioned in KWDT-1 report. The agricultural statistics for 2015-16 indicate that Nalgonda, Mahabubnagar, Rangareddy and Medak districts are susceptible to droughts in Telangana. Being a new state, the government is making every effort for optimal use of available water resources for agriculture, industrial sector as well as providing drinking water for overall development.

1.2 PROJECT OVERVIEW

Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) is one of the foremost and largest welfare projects being under taken by the Government of Telangana to supply clean potable water to the upland and water scarce areas of six draught prone districts (Mahabubnagar, Narayanpet, Nagarkurnool, Rangareddy, Vikarabad and Nalgonda) by utilizing water(90TMC) in about 60 days during the flood season from the fore shore of the Srisailam Reservoir project on Krishna river at Yellur (V), Kollapur(M) in Nagarkurnool (D) through five separate stages, ending at Padmaram (V), Chowdergudem (M), near Shadnagar town in Rangareddy district at the highest elevation. These five stages each comprise of a reservoir and conduit between each reservoir for taking the water forward with pump houses being constructed where necessary. One of the main purposes of this project is to provide water for drinking water to command and enroute villages and industrial purposes. The main plan is to use this water for irrigation in these 6 districts through a network of canals. Water will then be drawn from selected reservoirs through a separate canal and pipeline distribution network.

In view of drought situation in the benefiting area and problems of high fluoride content in the groundwater in 6 districts, the lift irrigation project was planned to be executed in two phases: Phase-I (Water Supply) and Phase-II (Irrigation). The entire scheme was planned with 6 balancing reservoirs from which water shall be lifted in 5 stages.

Phase-I (Water Supply): The purpose for the project is to provide water for drinking and industrial purposes to enroute villages and Hyderabad city. Therefore, the first phase of Palamuru-Ranga Reddy Lift Irrigation Scheme envisages to provide drinking water facilities to enroute 1226 villages in 70 mandals of Mahabubnagar, Narayanpet,Rangareddy, Nagarkurnool, Vikarabad and Nalgonda Districts, Hyderabad City and water to industrial use by constructing series of approach channels, open canals, tunnels, pump houses and reservoirs by lifting 90 TMC of water in 60 days during flood season (1.50 TMC per day) from foreshore of Srisailam reservoir located at Yellur (V), Kollapur (M) in Nagarkurnool district to Padmaram (V), Chowdergudem (M), in Rangareddy district which is the highest elevation in Mahabubnagar and Rangareddy districts with 5 stage lifting and then utilizing water by gravity.

Phase-II (Irrigation): Under Phase II the plan is to use this water for irrigation in various districts through a network of canals. The canal network will be developed from the reservoirs to create

irrigation to upland areas of Mahabubnagar, Narayanpet, Nagarkurnool, Rangareddy, Vikarabad and Nalgonda districts for a command of 4,97,976 ha by gravity.

Thus, Palamuru - Rangareddy Lift Irrigation Scheme is intended to irrigate upland areas of Mahabubnagar, Narayanpet, Rangareddy, Vikarabad, Nagarkurnool and Nalgonda districts for a command area of 4,97,976 ha (12.30 lakh acres) and provide water for domestic and industrial use. It's envisaged that the proposed project will benefit 1226 villages at an estimated cost of Rs. 55,086.57 Crores and is likely to be completed within 30 months' time frame. The total length of the canal network is about 915.47km.

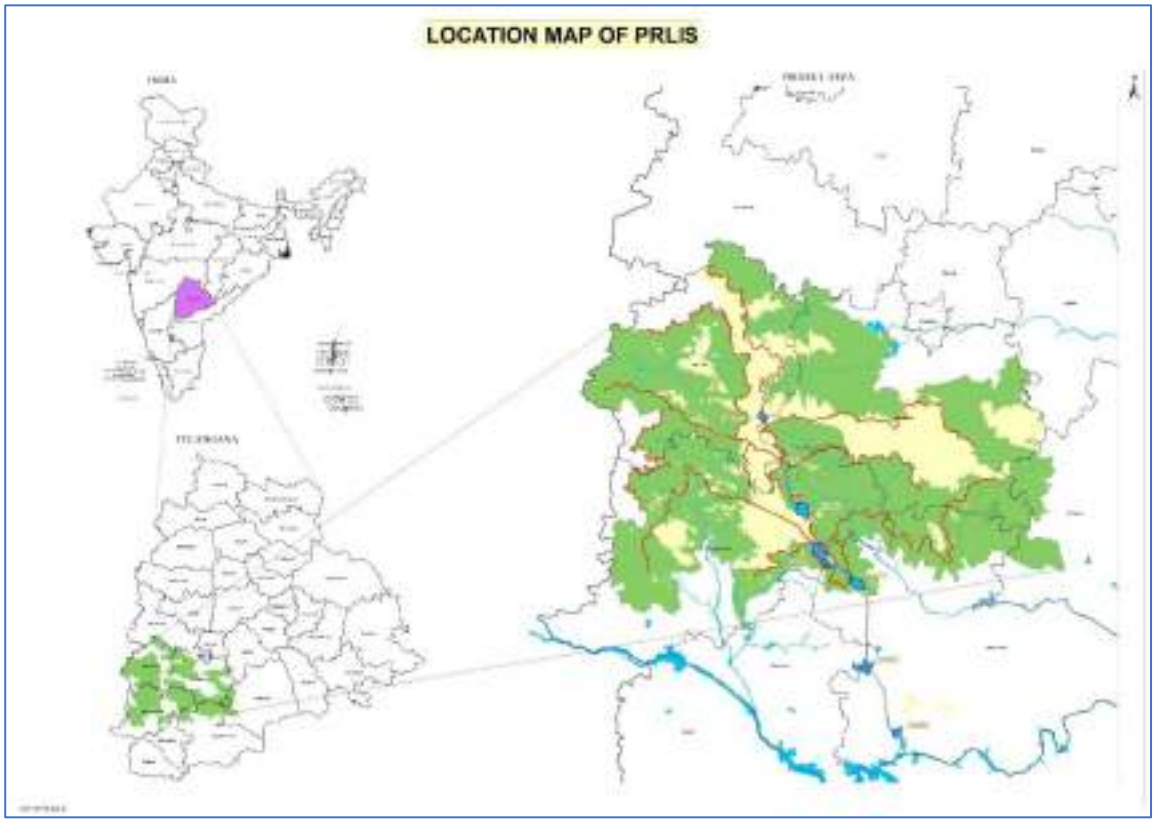


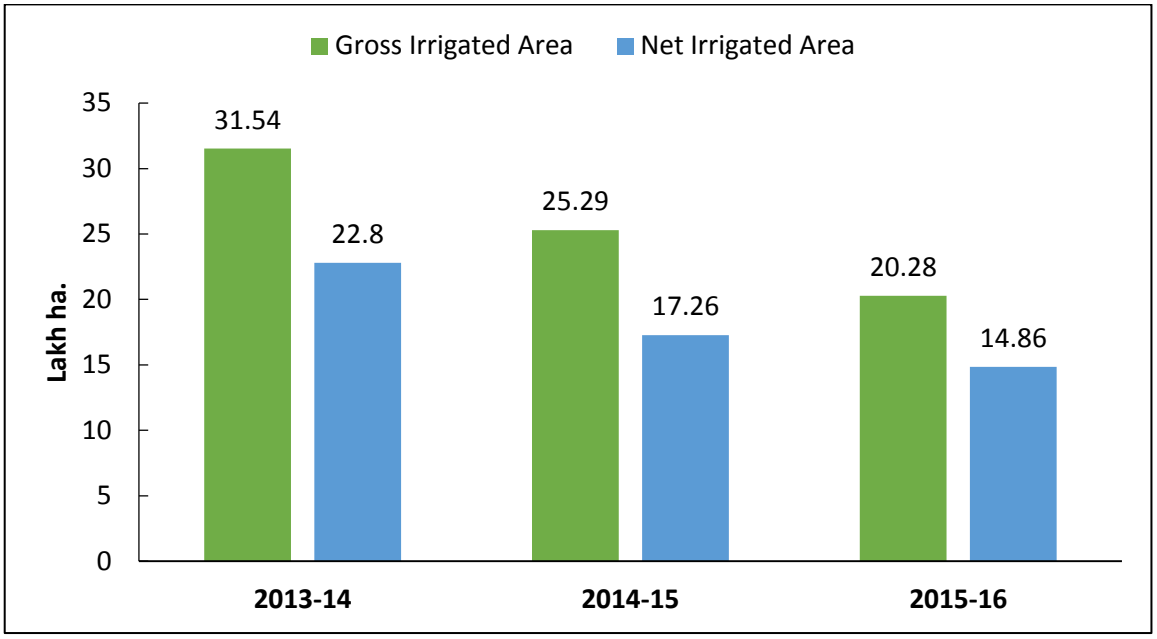
Figure 1.2: Location Map

1.3 JUSTIFICATION OF THE PROJECT

The economy of Telangana State is mainly agriculture based with over 61% of population residing in rural settings. As such, the economy is predominantly agrarian and is an important contributor to state GDP. The major sources of irrigation in the state are canals, tanks, tube wells, dug wells etc., and irrigation is being done with the use of various techniques such as surface irrigation, localized irrigation, drip irrigation, sprinkler irrigation, sub-irrigation depending upon the availability of source, accessibility and others to increase the productivity of the crop grown.

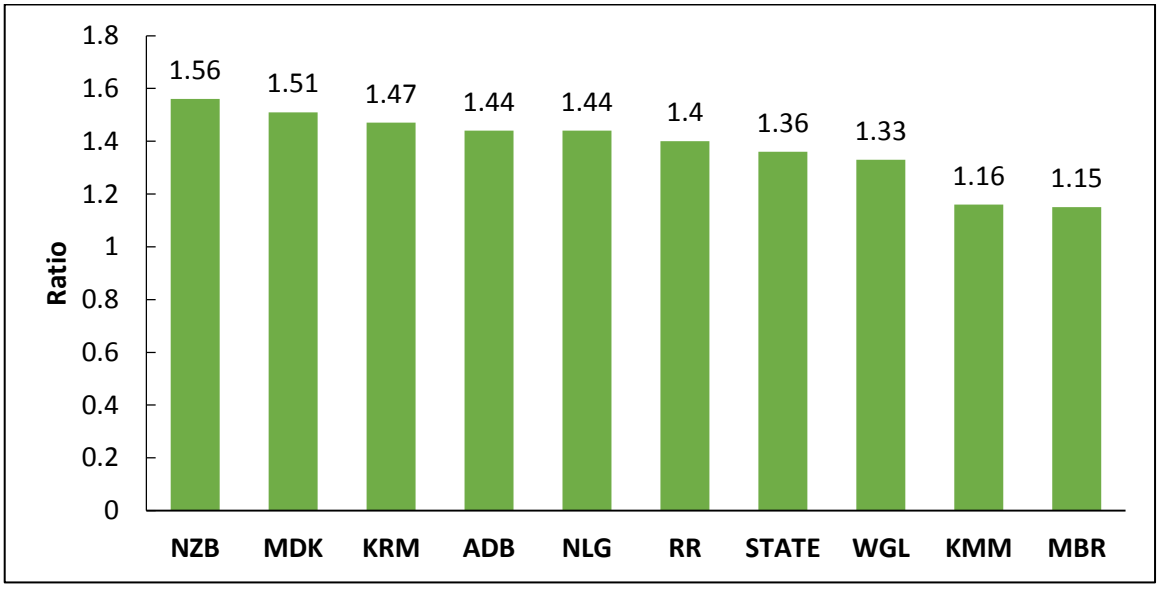
The gross cropped area stands at 62.88 lakh ha, while the net irrigated area is 22.89 lakh ha. The gross area irrigated in the State during 2015-16 has decreased to 20.28 lakh ha from 25.29 lakh ha in 2014-15, showing a decrease of 19.81%. Similarly, the net area irrigated has also decreased to 14.86 lakh ha in 2015-16 from 17.26 lakh ha in 2014-15 showing a decrease of 13.90%. Graphical

representation of Gross and Net areas irrigated during 2013-14 to 2015-16 along with the irrigation intensity for 2015-16 is depicted in Figure 1.3 and Figure 1.4.



Source: SYB-GoT, 2017

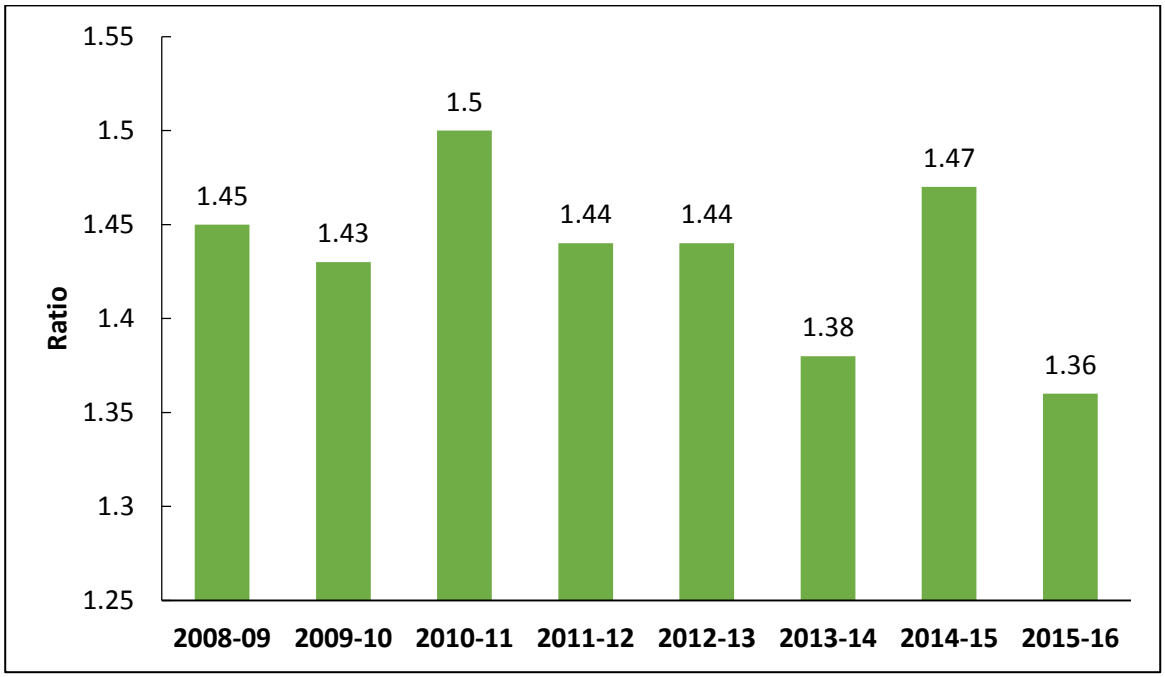
Figure 1.3: Gross and net irrigated area (2013-2016)



Source: SYB-GoT, 2017

Figure 1.4: District wise irrigation intensity in Telangana (2015-16)

The decadal irrigation intensities in the state of Telangana further indicate it's vital to augment the irrigation infrastructure (Figure 1-4). The source wise gross and net irrigated area presented in Table 1.1 also indicated a declining trend in gross as well as net irrigated area.



Source: SYB-GoT, 2017

Figure 1.5: Yearly irrigation intensities

Table 1.1: Source wise gross irrigated area (Lakh ha.)

Year	Tanks		Canals		Well (Tube & Dug)		Other sources	
	Gross Area	Net Area	Gross Area	Net Area	Gross Area	Net Area	Gross Area	Net Area
2008-09	2.86	2.38	3.74	2.74	19.80	13.10	0.80	0.61
2009-10	0.67	0.57	1.69	1.37	18.42	12.59	0.53	0.39
2010-11	3.05	2.38	5.04	3.16	21.11	13.96	0.79	0.55
2011-12	2.08	1.83	4.32	3.25	21.57	14.23	0.68	0.53
2012-13	1.79	1.58	1.21	0.90	22.07	14.86	0.50	0.40
2013-14	2.81	2.28	4.69	2.89	23.34	17.11	0.70	0.52
2014-15	1.13	0.97	2.43	1.74	21.16	14.13	0.57	0.43
2015-16	1.21	1.13	0.61	0.53	18.06	12.88	0.40	0.33

Source: DES-GoT, 2016.

Based on the above statistics, it's inevitable to increase the net irrigated area in order to meet the ever-increasing food demand, generate rural employment and reduce overall poverty in the region. This is also important considering its linkages in development with others sectors.

The Irrigation and Command Area Development (I&CAD) has been therefore mandated for planned utilization of 961.60 TMC and 298.96 TMC of water in Godavari and Krishna basins, apart from flood waters in Krishna basin considering its irrigation potential.

The newly re-organized districts Mahabubnagar, Narayanpet, Nagarkurnool, Rangareddy, Vikarabad and Nalgonda of Telangana State are the one of the drought prone and distressed areas in country. Further, there is significant shortage of drinking water; as a result, a large part of the population of these districts is being forced to migrate to other parts of the country. The

situation is further compounded due presence of fluoride in water. In order to redress this situation, the Government of Telangana has taken up the Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) for alleviating the misery of these drought prone areas. The net irrigated Area is 23.8% of Net Cropped Area in Mahabbubnagar district and it is only 13.2%, 24.4%, 24.2% and 18.1% respectively in Nagarkurnool, Nalgonda, Rangareddy and Vikarabad districts.

GoT has taken up the ambitious task to irrigate drought prone areas of these six districts and provide potable drinking water and augment irrigation infrastructure in the region through Palamuru Rangareddy Lift Irrigation Scheme, hereafter referred as PRLIS.

1.4 NEED FOR EIA STUDY

The purpose of environmental impact assessment (EIA) of the proposed irrigation project is to identify and evaluate the nature, magnitude and significant potential adverse environmental impacts arising during construction and operation phase of the project.

It is important to note that river valley projects are considered as most sensitive in terms of pervasively of their influence in altering environmental resources amid all other development projects due to major alteration in the hydrologic regime of the watershed involved. Therefore, it's important to identify and evaluate anticipated environmental impacts during construction and operation phase of the proposed Irrigation Project as mandated by the EIA Notification 2006 and its subsequent amendments.

1.5 PROJECT PROPONENT

Palamuru Rangareddy Lift Irrigation Scheme, Erramanzil, Hyderabad, Telangana is the inherent project proponent. The Irrigation and Command Area Development (I&CAD) is responsible for estimation, planning and comprehensive utilization of surface and ground water resources of the State.

1.6 EIA CONSULTANT

The task of preparation of EIA-EMP report of the project has been awarded to M/s Voyants Solution Pvt. Ltd., 403-4th Floor, BPTP Park Centra, Sector-30, NH-8, Gurugram - 122001, Haryana. The organization is accredited with NABET/ Quality Control of India to conduct the Environment Impact Assessment Studies for river valley projects among others (IA-173 AC Meeting, March 30, 2016 and SA-184 AC Meeting, March 9, 2017, RA-182 AC meeting, November, 16, 2018). The agency has embarked upon the task to complete it with due diligence in the scheduled time. QCI –NABET Certificate along with validity letters enclosed as **Annexure I**

1.7 POLICY, LEGAL, AND ADMINISTRATIVE STATUTORY

The emerging environmental scenario calls for requisite attention on conservation and proper use of natural resources and development without destruction. The environmental consideration in any development process has become a necessity for achieving sustainable development. To achieve these goals, the Ministry of Environment, Forests and Climate Change (MoEF&CC), Govt.

of India, has enacted various acts, legislations, guidelines and standards from time to time and is the principal environmental regulatory agency. MoEF&CC has been mandated to formulates environmental policies and accords environmental clearances for different projects in India. The important environmental legislations in India are presented in **Table 1.2.**

Table 1.2: Key Environmental Legislations

Name	Scope & Objective	Key Areas	Operational Agencies/Key player
Water (Prevention and Control of Pollution) Act, 1974, 1988	Prevention and control of water pollution, and enhancing the quality of water	Control discharge of sewage and industrial effluent	Central and State Pollution Control Boards
Air (Prevention and Control of Pollution) Act, 1981, 1987	Prevention and control of air pollution	Control emission of air pollutants	Central and State Pollution Control Board
Forest (Conservation) Act, 1980, 1988	To consolidate acquisition of common property such as forest, halt India's rapid deforestation and resulting environmental degradation	Regulates access to natural resources, state has a monopoly right over land, categories forests, restriction on de-reservation and using forest for non-forest purpose	State Government and Central Government
Wildlife (Protection) Act, 1972, 1993	To protect wildlife	Creates protected areas (national parks / sanctuaries) categories of wildlife which are protected	Wildlife Advisory Boards, Central Zoo Authorities
Environment (Protection) Act, 1986	To provide for the protection and improvement of environment	An umbrella legislation, supplements pollution laws	Central government nodal agency, MoEF&CC can delegate to state departments of environment
EIA Notification 14th Sep 2006 and amendment thereof	Environment Impact Assessment	Environmental Protection	Project Development, State and Central Government
National Water Policy, 2012	Legislation needed in view of inequalities in distribution and lack of unified perspective in planning, management	To recognize and consider while planning the environmental needs of aquatic	State and Central Government

Name	Scope & Objective	Key Areas	Operational Agencies/Key player
	and use of water resources with due consideration to environmental sustainability and holistic benefit to the people.	eco-system, wetlands and embanked flood plains besides adaptation to strategies to provide a mechanism for dealing with increased variability due to climate change.	
Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	To address concerns of farmers and those whose livelihoods is dependent on land being acquired and at the same time facilitating land acquisition in a timely and transparent manner and for ensuring comprehensive package for the land owners for calculation of market value of the land besides comprehensive rehabilitation and resettlement package for land owners.	Social issues	Central and State Government

1.8 SCOPING OF THE PROJECT

In so far as the water supply projects do not fall under purview of Environmental Clearance of EIA Notification, Phase - I project works has been initiated to address the urgent and dire drought situation on an immediate basis.

The irrigation component under Phase-II of the project falls under Category A of River Valley Projects (Sl. No. 1 C (ii) as per EIA Notification, 2006 and require Environmental Clearance (EC) from EAC of MoEF&CC, New Delhi.

In consonance with the provision under section-6 of MoEF&CC notification, dated 14thSeptember 2006, the project proponent moved an application in the prescribed Form-I duly filled along with a copy of Pre-Feasibility (PFR) of the project to MoEF&CC, New Delhi. As per this notification, including its subsequent amendments, the proposed PRLIS falls under River Valley Project category - schedule 1(c) (ii) under “Category A”, as it has more than 10,000 ha of Culturable Command Area (CCA). The total CCA of this project is 4,97,976 ha (12.30 lakh acres). The

MoEF&CC has issued the Terms of Reference (ToR) on 11th October 2017, vide Ref. No. J-12011/31//2017-IA-I (R), in respect project activity contemplated under Phase-II of PRLIS.

Later on, an amendment of the EIA Notification came into force on 14th August, 2018. As per the amended notification, Irrigation projects >= 50,000 ha of Culturable Command Area (CCA) fall under Category A. Therefore, considering this new amendment also, the proposed PRLIS (CCA: 4,97,976 ha) is falling under Category A and will be appraised by EAC of MoEF&CC, New Delhi.

1.9 TOR COMPLIANCE

The Environmental Impact Assessment and Environmental MP reports have been prepared in conformity with all issues brought out in detailed ToR issued by EAC, vide Ref. No. J-12011/31//2017-IA-I (R), dated 11th October 2017. The brief issues involved along with their reference of compliances have been listed in **Table 1.3.** The issued Terms of Reference is enclosed as **Annexure II**

Table 1.3: ToR Compliance

Point No.	Comment	Reference of compliance
a)	The EIA/ EMP report should contain the information in accordance with provisions & stipulations as given in the Annexure-I.	Complied
b)	The consultant engaged for preparation of EIA/ EMP report has to be registered with Quality Council of India (QCI/ NABET under the scheme of Accreditation & Registration of MoEF. This is a pre-requisite.	The QCI/ NABET Certificate is enclosed as ANNEXURE I.
c)	Consultant shall include a "Certificate" in the EIA/ EMP Report regarding portion of EIA/ EMP prepared by them and data provided by other organization(s)/ laboratories including status of approval of such laboratories.	The NABL Accreditation Certificate of Vision Lab (sub-consultant for baseline monitoring) is enclosed as ANNEXURE III.
d)	The draft EIA/ EMP report prepared as per Annexure-I should be submitted to the State Pollution Council Board Committee concerned for conducting Public Consultation as per the provisions stipulated on EIA Notification of 2006. Public Hearing, which is a component of Public Consultation, shall be held district wise at the site or on its close proximity as prescribed in Appendix (IV) of EIA Notification, 2006 The draft EIA/ EMP report is to be submitted to SPCB, etc. sufficiently before the expiry pf the ToR validity so that necessary amendments in EIA/ EMP can be undertaken based on public hearing and the same is submitted to MoEF&CC before expiry of validity.	The Draft EIA/ EMP Report was submitted to Chief Engineer, PRLIS on March 16, 2019 for further circulation to respective Regional Offices (R.O.) of Telangana State Pollution Control Board in all the districts concerned for Public Hearing. Environmental Public Hearing was conducted by Telangana State Pollution Control Board on 10th August, 2021 simultaneously in six districts namely Mahabubnagar, Nagarkurnool, Rangareddy, Vikarabad, Nalgonda and Narayanpet Districts.
e)	The PP has disclosed during the ToR presentation that Monsoon season data has been collected in 2017 for this project and requested the EAC to accept the same for use in EIA? EMP report. The committee accepts that the Monsoon data collected can be included in the EIA/ EMP Report.	Environmental monitoring was carried out in accordance with the Terms of Reference (ToR) (vide letter dt. 11th October, 2017; No. J-12011/31/31/2017-IA-I (R)) issued by the Ministry of Environment and Climate Change (MoEF&CC) covering three seasons – Monsoon-2019; post-Monsoon, 2019 and Pre-Monsoon, 2020. Selection

Point No.	Comment	Reference of compliance
f)	All issues discussed in the Public Hearing/ Consultations should be addressed and incorporated in the EIA/ EMP report. Final EIA/ EMP report should be submitted to the Ministry for Environmental Clearance only after incorporating these issues before the expiry of validity of ToR.	The issues & concerns arose during Public Hearing/ Consultations have been compiled and discussed in Chapter-7 of EIA Report.
g)	The ToR will remain valid for a period of 4 years from the date of issue of this letter for submission of EIA/ EMP report along with public consultation. The ToR will stand lapsed on completion of 4 years in case Final EIA/ EMP is not submitted and the validity is not extended.	As per the Gazette Notification vide S.O. 751 € dated 17/02/2020; the validity of ToR for River Valley Projects will be for five years.
h)	In case any change in the scope of the project such as capacity enhancement, change in submergence, etc., fresh scoping clearance has to be obtained by the project proponent.	Noted
i)	The PP should submit a copy of TEC of the DPR along with EIA/ EMP report.	Noted
j)	Information pertaining to Corporate Environmental Responsibility and Environmental Policy shall be provided in the EIA/ EMP Report as per this Ministry's OM No. J-11013/25/2014-IA-I dated 11.08.2014 (Reference as Annexure II)	As per Ministry's OM No. J-11013/25/2014-IA-I dated 11.08.2014; Serial No. 5, this act is not applicable for this proposed project.
k)	The EIA/ EMP report must contain an Index showing details of compliance of all ToR conditions. The Index will comprise of page no. etc., vide which compliance of a specific ToR is available. It may be noted that without this index, EIA/ EMP report will not be accepted.	Complied.
l)	In case the validity is to be extended, necessary application is to be submitted to Regulatory Authority before expiry of validity period together with an updated Form-I based on propoer justification.	Noted
A	**Physical and Chemical Environment**	
1	**Geological and Geophysical Aspects and Seismo-Tectonics:**	
	• Physical Geography, Topography, Regional Geological aspects and structure of the catchment. • Tectonics, Seismicity and History of past earthquakes in the area. A site-specific study of earthquake parameters will be done. The results of the site-specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic design parameters, Central Water Commission, New Delhi for large dams. • Landslide zone or area prone to landslide existing in the study area should be examined. • Presence of important economic mineral deposit, if any. • Justification for location & execution of the project in relation to structural components (dam height). • Impact of project on geological environment.	Section 3.4.1, 3.4.2 of EIA Section 3.4.3 of EIA Section 3.4.7 of EIA Chapter-2 of EIA Section 4.1. 2 of EIA
2	**Meteorology, Air and Noise**	

Point No.	Comment	Reference of compliance
	• Meteorology (viz., Temperature, Relative Humidity, wind speed/direction etc.) to be collected from nearest IMD station. • Ambient Air Quality with parameters viz., Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e., suspended particulate materials <10-microns, Sulphur Dioxide (SO_2), Oxides of Nitrogen (NO_2), in the study area at 6 locations. • Existing noise levels and traffic density in the study area at 6 locations.	Section 3.5.1, 3.5.2, 3.5.3, 3.5.4 of EIA Section 3.5.5 of EIA Section 3.5.6 of EIA
3	**Soil Characteristics**	
	Soil classification, physical parameters (viz., texture, porosity, bulk density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, Magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.,) (6 locations).	Section 3.6 of EIA
4	**Remote sensing and GIS Studies**	
	Generation of thematic maps viz., slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared. New Configuration map to be given in EIA report	Chapter-3 of EIA
5	**Water Quality**	
	• History of the ground water table fluctuation in the study area. • Water quality for both surface water and ground water for (i)Physical parameters'(pH, temperature, electrical conductivity, TSS); (ii)Chemical parameters (Alkalinity, Hardness, BOD, COD, NO_2, PO_4, Cl, SO_4, Na, K, Ca Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameters (MPN, Total coliforms) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr^{-6}, total Cr, Cu, Zn, Fe) (6 locations). • Delineation of sub and micro-watersheds, their locations and extent based on the All-India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS.	Section 3.7 & 3.8 of EIA
B	**Water Environment & Hydrology**	
	• Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring. • Run-off, discharge, water availability for the project, sedimentation rate, etc.	Section 3.8 of EIA

Point No.	Comment	Reference of compliance
	• Basin characteristic's • Catastrophic events like cloud bursts and flash floods, if any, should be documented. • For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km 2 year-I • Sedimentation data available with CWC may be used to find out the loss in storage over the years. • Set-up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation. • Flow series, 10 dailies with 90%, 75% and 50% dependable years discharges. • A table of 10 daily water discharge in 75% dependable year showing the intercepted discharge at the barrage, diversion for irrigation, environmental and other flow releases downstream of the barrage shall be included in the EIA report • Environmental flow release would be 20% of the average of 4 consecutive months of 90% dependable year in lean season, 25% in non-monsoon and non-lean season and 30% in monsoon to be followed corresponding to 90% dependable year. A site-specific study on minimum environmental flow should be carried out. • Hydrological studies as approved by CWC shall be utilized in the preparation of EIA/ EMP report. Actual Hydrological annual yield may also be given in the report • A minimum of 1 Km distance from tip of the reservoir to tail race tunnel should be maintained between upstream and downstream projects.	
C	**Biological Environment**	
	Besides primary studies review of secondary data/ literature published for project area on flora and fauna including RET species shall be reported in EIA/EMP report. **Flora:** • Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan. • Documentation of all plant species i.e., Angiosperm, Gymnosperm, Pteridophytes, Bryophytes (all groups). All species list should be provided. • General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A species wise list may be provided.	Section 3.9 of EIA

Point No.	Comment	Reference of compliance
	• Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index (IVI, Shannon Weiner index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems. • Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if, any, should be detailed. • Economically important species like medicinal plants, timber, fuel wood etc. • Details of endemic species found in the project area. • Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along-with economic significance. Species diversity curve for RET species should be given. Cropping pattern and horticultural practices in the study area. Bio diversity study shall be carried out by associating a reputed organization as per the list of such institute available on MoEF&CC website. **Fauna:** Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status along with Schedule of the species. • Information (authenticated) on Avi-fauna and wildlife in the study area. • Status of avifauna their resident/ migratory/ passage migrants etc. • Documentation of butterflies, if any, found in the area. • Details of endemic species found in the project area. • RET species-voucher specimens should be collected along-with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972. • Existence of barriers and corridors, if any, for wild animals. • Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity. • Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities	

Point No.	Comment	Reference of compliance
	components.	
D	**Aquatic Ecology**	
	• Documentation of aquatic fauna like macro-invertebrates, zooplankton, Phyto-planktons, benthos etc. • Fish and fisheries, their migration and breeding grounds. • Fish diversity composition and maximum length & weight of the measured populations to be studied for estimation of environmental flow. • Conservation status of aquatic fauna. • Sampling for aquatic ecology and fisheries must be conducted during three Seasons-Pre-monsoon (summer), monsoon and winter. Sizes (length & weight) of important fish species need to be collected and breeding and feeding grounds should also be identified along the project site or in vicinity.	Section 3.9.12 of EIA
E	**Socio-economic**	
	• Collection of baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surroundings population. • Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project Proponent. • Collection of information on sensitive habitat of historical, cultural and religious and ecological importance. • The socio-economic survey/ profile within 10 km of the study area for demographic profile; Economic Structure; Developmental Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc. • Documentation of demographic, Ethnographic, Economic Structure and development profile of the area. • Information on Agricultural Practices, Cultural and aesthetic sites, Infrastructure facilities etc. • Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land. • List of all the Project Affected Families with their names, age, educational qualification, family size, sex, religion, caste, source of income, land and householdings, other properties, occupation, source of income, house/land and other properties to be acquired, etc. and house / land left with family, any other property, possession of cattle, type of house etc.	Section 3.10 of EIA

Point No.	Comment	Reference of compliance
	• In addition to socio-economic aspects of the study area, a separate chapter on socio-culture aspects based upon study on Ethnography of the area should be provided.	
7	**Impact Prediction and Mitigation Measures** The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.	Chapter 4 of EIA
(i)	**Air Environment**	
	• Changes in ambient and ground level concentrations due to total emissions from point, line and area sources. • Effect on soil, material, vegetation and human health. • Impact of emissions from DG set used for power during the construction, if any, on air environment. • Pollution due to fuel combustion in equipment and vehicles • Fugitive emissions from various sources	Section 4.4 of EIA
(ii)	**Water Environment**	
	• Changes in surface and ground water quality. • Steps to develop pisci-culture and recreational facilities • Changes in hydraulic regime and downstream flow. • Water pollution due to disposal of sewage • Water pollution from labor colonies/ camps and washing equipment.	Section 4.3 of EIA
(iii)	**Land Environment**	
	• Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction/widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures. • Changes in land use / land cover and drainage pattern • Immigration of labour population • Quarrying operation and muck disposal • Changes in land quality including effects of waste disposal. • River bank and their stability • Impact due to submergence.	Section 4.2 of EIA
(iv)	**Biological Environment:**	
	• Impact on forests, flora, fauna including wildlife, migratory avi-fauna rare and endangered species, medicinal plants etc. • Pressure on existing natural resources. • Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors. • Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.	Section 4.6 of EIA

Point No.	Comment	Reference of compliance
	• Impact on fish migration and habitat degradation due to decreased flow of water. • Impact on breeding and nesting grounds of animals and fish.	
(v)	**Socio-economic Aspects:**	
	• Impact on local community including demographic profile. • Impact on socio-economic status. • Impact on economic status. • Impact on human health due to water / water borne disease • Impact on increase traffic. • Impact on Holy Places and Tourism. • Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying-up of natural springs and cause noise pollution will be studied. Proper record shall be maintained of the baseline information in the post project period. • Positive and negative impacts likely to be accrued due to the project are listed.	Section 4.7 of EIA
8	**Environmental Management Plans**	
i)	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of free draining/ directly draining catchment based upon Remote Sensing and Geographical Information System (GIS) methodology and Sediment Yield Index (SYI) Method of SLUSOI coupled with ground survey. Areas or watersheds falling under 'very severe' and 'severe' erosion categories are required be treated. Both biological as well as engineering measures should be proposed in consultation with State Forest Department. Year-wise schedule of work and monetary allocation should be provided. Mitigation measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be included.	Section 10.1 of EIA
ii)	Command area Development (CAD) Plan giving details of implementation Schedule with a sample CAD plan	Section 10.2 of EIA
iii)	Compensatory Afforestation shall be prepared by the state forest department in lieu of the forest land proposed to be diverted for construction of the project as per the forest (conservation) act 1980. Choice of plants for afforestation should include native and RET species, if any.	Section 10.3 of EIA
iv)	Biodiversity and Wild Life Conservation & Management Plan for conservation and preservation of rare, endangered or endemic floral/faunal species or some national park/ sanctuary / biosphere reserve or other protected area is going to get affected directly or indirectly by construction of the project/then suitable conservation measures should be prepared in consultation with State Forest Department	Section 10.4 of EIA

Point No.	Comment	Reference of compliance
v)	Resettlement and Rehabilitation (R&R) Plan need to be prepared with due consultation with Project Affected Families (PAFs) and the state Government. Detailed budgetary estimates are to be provided. Resettlements sites should be identified. The plan will also incorporate community development strategies. Land acquisition for the project whose land is to be acquired should be suitably compensated in accordance with the law of the land and prevailing guidelines. R&R plan is to be formulated as per new Act 2013 which came into force w.e.f. 1.1. 2014	Section 10.5 of EIA
vi)	Green Belt Development Plan along the periphery of reservoir, approach roads, around the colonies and other project components, Local plant species must be suspected with physical and financial details. Local plant species suitable for green belt should be selected	Section 10.6 of EIA
vii)	Fisheries Conservation & Management Plan - Fish fauna inhabiting the affected stretch of river, a specific fisheries management plan should be prepared for river and reservoir. If any migratory fish species is getting affected then the migratory roots, time / season of upstream and downstream migration, spawning grounds etc. will be discussed in details.	Section 10.9 of EIA
viii)	Reservoir Rim Treatment Plan for stabilization of land slide/land slip zones if any, around the reservoir periphery to be prepared based on detailed survey of geology of the reservoir rim area. Suitable engineering and biological measures for treatment of the identified slip zones to be suggested with physical and financial schedule.	Section 10.7 of EIA
ix)	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and State Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. The plan shall have physical and financial details of the measures proposed.	Section 10.10 of EIA
x)	Plan for Restoration of quarry sites and landscaping of colony areas, working areas, roads, etc. Details of the course/ fine aggregate/ clay etc. required for construction of the project and the rock/ clay quarries / river shoal sites identified for the project should be discussed along with the engineering and biological measures proposed for their restoration with physical and financial details.	Section 10.11 of EIA
xi)	Study of design earthquake parameters: A site specific study of earth quake parameters should be done. Results of the site specific earth quake parameters should be approved by National Committee of Seismic design parameters, Central Water Commission (NCSDP), New Delhi.	The project site is distinctly located in Zone II which is a Low Damage Risk Zone (MSKVI or less).

Point No.	Comment	Reference of compliance
xii)	Dam Break Analysis and Disaster Management Plan: The outputs of Dam Break Model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam break scenario. The action Plan will include emergency action and Management Plan including measures like preventive action notification, warning procedure and action plan for coordination with various authorities.	Section 10.12 of EIA
xiii)	Water, Air and Noise Management Plans to be implemented during construction and post construction periods.	Section 10.13 of EIA
xiv)	Mitigation measures due to Blasting on the structures in the vicinity.	Section 10.14 of EIA
xv)	Ground Water Management Plan	Section 10.15 of EIA
xvi)	Public Health Delivery Plan including the provisions of drinking water supply for local community	Section 10.16 of EIA
xvii)	Sanitation and Solid-waste management plan for domestic waste from colonies and labour camps etc.	Section 10.18 of EIA
xviii)	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Panchayats. Local skill development schemes should be given. Details of various activities to be undertaken along with its financial out lay should be provided.	Section 10.19 of EIA
ixx)	Environmental Safeguards during construction activities including Road Construction.	Section 10.20 of EIA
xx)	Energy Conservation Measures	Section 10.21 of EIA
xxii)	Environmental Monitoring programme with physical and financial details covering all the aspects of EMP. A Summary of Cost Estimates for all the plans**,** cost for implementing all the Environmental Management Plans.	Section 10.22 of EIA
9	In the EMP, please include CAD plan for a distributary outlet command such plan to show the alignment of irrigation and drainage channels the components of OFD works to be undertaken may be clearly mentioned along with a time schedule their completion vis & vis the progress of Irrigation development.	Figure, 3.1 of EIA
E	**Irrigation and Cropping Pattern**	
	• Cropping Pattern and Horticulture practices in the study area. • Collection of primary data on agriculture activities, crops and their productivity and irrigation facilities component. • Component of pressurized/drip irrigation and micro irrigation • Details of conjunctive use of water for irrigation	Section 2.9 of EIA
viii)	Plan for Land Restoration and Landscaping of project sites.	Section 10.8 of EIA
xvii)	Labour Management Plan for their Health and Safety.	Section 10.17 of EIA
	Additional TOR	
i)	The scheme in its first phase envisages lifting of 90 TMC of floodwater in 60 days during the flood season from the foreshore of the Srisaliam project on Krishna River	Chapter 2 of EIA

Point No.	Comment	Reference of compliance
	at Yellur village through five separate stages, ending at K.P. Laxidevipally village. Therefore, water availability analysis at Yelluru village (point of drawl) during monsoon season is to be submitted to ascertain sufficiency of water available.	
ii)	As the area is on fluoride affected zone, therefore, provisions should also be made to recharge the groundwater through proposed reservoirs to dilute fluoride levels.	Provision made for recharging the groundwater (Section10.15.8 and Section10.19.4)
iii)	Groundwater be treated for removal of fluoride and then the treated water be supplied to the villagers for drinking purposes.	Agreed. Under Mission Bhagiratha, the government has built a water treatment plant to provide safe drinking water to 585 villages affected by fluorosis.
iv)	Provision of e-flow should be ensured for the sustenance of aquatic life in the downstream river.	PRLIS is a lift irrigation scheme with Srisailam Reservoir on Krishna River as source for pumping of water. Therefore, whatever environmental flows have to be released that shall be from the reservoir of Srisailam project.
v)	Land acquired for the project shall be suitably compensated in accordance with the law of land with the prevailing guidelines.	Section 2.4 of EIA
vi)	Though, total power requirement has been provided, but its firm linkage is to be supported with documents.	The power linkage and supporting documents are attached as Annexure X.
vii)	Proof of application for diversion of forestland for non-forest purpose will be submitted to the Ministry within one month, if any.	Forest Clearance Letter is enclosed as Annexure VI
viii)	Information on species composition in particular to fish species from any previous study/literature should be included.	Section 3.9.12 of EIA
ix)	The clearance from Standing Committee of NBWL under the Wildlife (Protection) Act, 1972 should be obtained, as applicable.	Not applicable
x)	Wildlife Conservation plan be prepared for the area located within the project and implemented by the project proponent in consultation with the State Forest Department, Wildlife Conservation plan also to be prepared for the impacted area due to construction of the project falling outside the project area and implemented by the local State Forest Department.	Refer Annexure 5
xi)	Solid waste management should be planned in details, Land filling of plastic waste shall be avoided and instead proposal for various uses may be proposed in the revised EIA/EMP report.	Section 10.18 of EIA
xii)	Resettlement & Rehabilitation Plan should be implemented as per the prevail guidelines of the Govt. of India.	Section 10.5 of EIA
xiii)	Skill mapping be undertaken for the youths of the affected project area and based on the skill mapping necessary trainings to the youths be provided for their appropriate engagements in the Project.	Section 10.19 of EIA

1.10 LITIGATION & COURT CASES

The current status of all litigation/court cases in the matter(s) related to the project are brought out in **Table1.4.**

Table 1.4: Status of Litigation/Court Cases

S.N.	Court	Case Number with type	Case Year	Petitioner	Respondent	Case Subject	Present stage of Case
1	NGT,Southern Bench at Chennai	O.A No. 147	2021	Kosgi Venkataiah S/o Kosgi Balaiah	Union of India & 4 Others	Illegal mining in Udandapur Reservoir under Palamuru Rangareddy Lift Irrigation scheme	The aforesaid cases were disposed of on 22.12.2022, by the Hon'ble National Green Tribunal (NGT), Southern Bench at Chennai. , with the following directions: "In the above circumstances, we are not in agreement with the argument of the State of Telangana that it is only for the drinking purpose and that it does not attract Environmental Clearance. Without the Environmental Clearance, having completed the construction of at least 90% of the entire project, the State of Telangana has to be assessed for the Environmental Compensation for the mitigation purposes. In the light of the above, the Original Applications are disposed of on the following----------"
2	NGT,Southern Bench at Chennai	O.A No. 148	2021	D. Chandramouleswara Reddy & 8 Others	Union of India & 5 Others	Construction of Palamuru Rangareddy Lift Irrigation Scheme, State of Telangana in violation of the provisions of the environmental lawas and against the undertaking given by them in the earlier proceedings.	
3	Honourable Supreme Court of Indaia	CANo.751-752/2023	2023	State of Telangana	D. Chandramaouleswara & others	Exemption from filing c/c of the impugned Judgement & IA No. 23493/2023-Stay Application	Till the next date of hearing, there will be stay of recovery of compensation and penalty amount. Direction given to the appellant to not continue with the construction of the infrastructure protect except for providing drinking water to *en route* villages to the extent of 7.15 TMC of water.

The copy of the Court proceedings is enclosed as **Annexure IV**

1.11 STRUCTURE OF REPORT

Generic structure of environmental impact assessment Document as mentioned in Appendix-III has been followed and report has been compiled in one volume as per instruction of MoEF&CC, New Delhi. As per recommendation of EAC, River Valley & Hydro Projects, while apprising the PRLIS Project for EC, in its 34th meeting held on 14th September, 2022, an independent Chapter-13, related to Assessment of ecological damage and EMP comprising remediation plan and natural and community resource augmentation plan corresponding to the ecological damage assessed and economic benefits derived due to violation to be done, has been added.

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CHAPTER 2 PROJECT DESCRIPTION

The Government of Telangana has contemplated Palamuru Rangareddy Lift Irrigation Scheme (PRLIS), with a view to supply clean potable water to the upland and water scarce areas of six draught prone districts Mahbubnagar, Narayanpet, Nagarkurnool, Rangareddy, Vikarabad and Nalgonda. The Government has embarked upon the ambitious welfare project by utilizing 90TMC of water in about 60 days during the flood season from the fore shore of the Srisailam Reservoir project on Krishna River at village Yellur in Kollapur mandal of district Mahbubnagar. In view of drought situation in the benefiting area in 6 districts, the lift irrigation project was planned to be executed in two phases: Phase-I (Water Supply) and Phase-II (Irrigation). The entire scheme was planned with 6 reservoirs from which water shall be lifted in 5stages. The purpose for the Phase-1 of project is to provide water for drinking and industrial purposes to enroute villages and Hyderabad city. Therefore, the first phase of PRLIS envisages to provide drinking water facilities to enroute 1226villages in 70mandals of Mahabubnagar, Narayanpet ,Rangareddy, Vikarabad, Nagarkurnool and Nalgonda Districts, Hyderabad City and water to industrial use in Mahabubnagar, Narayanpet, Rangareddy, Vikarabad, Nagarkurnool and Nalgonda Districts by constructing series of approach channels, open canals, tunnels, pump houses and reservoirs by lifting 90 TMC of water in 60 days during flood season (1.50 TMC per day) from foreshore of Srisailam reservoir located at Yellur (V), Kollapur (M) in Mahabubnagar district to Padmaram (V), Chowdergudem (M),near Shadnagar town which is the highest elevation in Mahabubnagar and Rangareddy districts with 5 stage lifting and then utilizing water by gravity.

The project involves construction of six balancing reservoirs - Anjanagiri, Veeranjaneya, Venkatadri, Kurumurthyraya, Udandapur and K.P Lakshmidevipally and 5 stages of lifting and then utilizing water by gravity. It has been postulated to lift 90 TMC of water of which, around 82.52 TMC has been reserved for irrigation purpose and 7.15 TMC and 0.33 TMC respectively for drinking water needs and industrial uses.

Further, the said project has been planned to be executed in two phases. Phase-I envisages to provide drinking water supply, while Phase-II has been designed for irrigation purpose.

Phase-I (Water Supply):

Considering the portentous need to provide drinking water facilities, Phase-I envisages to provide drinking water facilities to 1226villages in 70 mandals of Mahabubnagar, Narayanpet Rangareddy, Vikarabad, Nagarkurnool and Nalgonda Districts and Hyderabad City. Further, the I&CAD also intends to provide water for industrial usage in Mahabubnagar, Narayanpet, Rangareddy, Vikarabad, Nagarkurnool and Nalgonda Districts by constructing approach channels, open canals, tunnels, pump houses and reservoirs by lifting 90 TMC of water in 60 days during flood season (1.50 TMC per day) from the foreshore of Srisailam reservoir located at Yellur (V), Kollapur (M) in Mahabubnagar district to Padmaram (V), Chowdergudem (M), near Shadnagar town which is the highest elevation in Mahabubnagar and Rangareddy districts with 5 stage lifting and then utilizing water by gravity. The location map of the project is shown in **Figure2.1** and the flow diagram of PRLIS Phase-I is shown in **Figure2.2.**

Phase-II (Irrigation):

In Phase-II the stored water at different reservoirs shall be harnessed to irrigate upland areas of Mahabubnagar, Narayanpet, Rangareddy, Nalgonda, Nagarkurnool and Vikarabad districts with a command area of 4,97,976 ha (12.30 lakh acres) by means of thirteen main canals with combined length of 915.47 km.

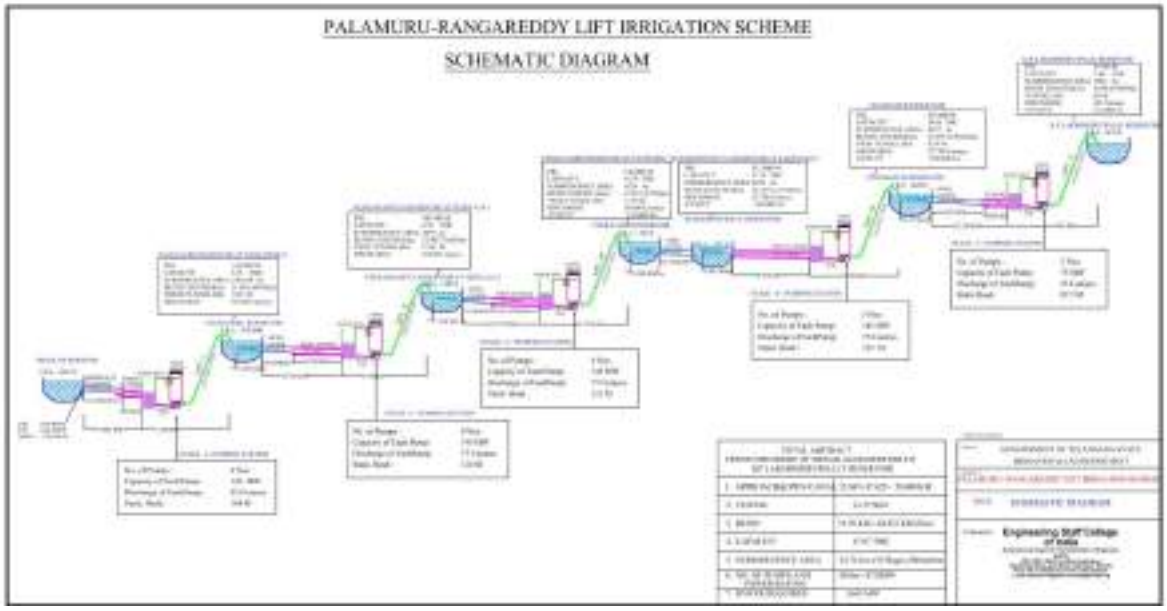


Figure 2.1: Flow Diagram of PRLIS

2.1 ACCESSIBILITY

The main canal network is approachable by road from the nearest towns. The nearest railway station is "Jadcherla" at a distance of 23 km. The nearest airport is Hyderabad at a distance of 93 km. Mahabubnagar is the District Head quarter, Jadcherla, Kalwakurthi, Narayanpet, Bhutpur, Devarakadra, Kodangal, Shadnagar in Mahabubnagar District & Gandeed, Tandur, Dharur, Chevella, Vikarabad and Pargi of Rangareddy district are the major towns located in the project area. The Secunderabad - Bangalore Railway line of SC Railway and Hyderabad - Bangalore NH-44 and SH-4 & SH-21 pass through the mid region of the project area and serve as important means of commuting. The main canals take off from different reservoirs whose accessibility is presented in **Table 2.1.**

Table 2.1: Project components and its accessibility

Project Component	Roads	Railway	Airport
Lift-1			
Pump House at Narlapur Village, Kollapur Mandal, Nagarkurnool District	45 Km. from NH-44	62 km from Gadwal Railway station	160 Km. from Shamshabad Airport at Hyderabad
Anjanagiri Reservoir at Narlapur Village, Kollapur Mandal, Nagarkurnool District	42 Km. from NH-44	62 Km. from Gadwal Railway Station	160 Km. from Shamshabad Airport at Hyderabad

Project Component	Roads	Railway	Airport
Lift-2			
Pump House at Teegalapalli Village, Kodair Mandal, Nagarkurnool District	37 Km. from NH-44	93 Km. from Mahbubnagar and 73 Km. from Gadwal Railway Stations	134 Km. from Shamshabad Airport at Hyderabad
Veeranjaneya Reservoir at Yedula Village, Gopalpet Mandal, Wanaparthy District	32 Km. from NH-44	93 Km. from Mahbubnagar and 73 Km. from Gadwal Railway Stations	132 Km. from Shamshabad Airport at Hyderabad
Lift-3			
1. Pump House at Vattem Village, Village, Bijinepally Mandal, Nagarkurnool District	32 Km. from NH-44	26 Km. from Jadcherla Railway Station	101Km. from Shamshabad Airport at Hyderabad
2. Venkatadri Reservoir at Vattem Village, Bijinapally Mandal, Nagarkurnool District	27 Km. from NH-44	21 Km. from Jadcherla Railway Station	96Km. from Shamshabad Airport at Hyderabad
Ayacut of Main Canal of Venkatadri Reservoir	14 Km. from NH-44	Accessible from Jadcherla Railway Station	
Link Canal from Venkatadri to Kurumurthyraya Reservoir			
Open Canal	14 Km. from NH-44	20 Km. from Mahabubnagar and 14 Km. from Jadcherla Railway Stations	
Kurumurthyraya Reservoir at Karvena Village, Boothpur Mandal, Mahabubnagar District	4 Km. from NH-44	21Km. from Mahabubnagar and 13 Km. from Jadcherla Railway Stations	80Km. from Shamshabad Airport at Hyderabad
Ayacut of Main Canal of Kurumurthyraya Reservoir	Passing through NH-44 and Raichur - Mahabub-nagar State Highway	10 Km. from Mahabubnagar and Jadcherla Railway Stations	
Ayacut of Main Canal of Venkatadri Reservoir	14 Km. from NH-44	Accessible from Jadcherla Railway Station	
Pump House at Udandapur Village, Jadcherla Mandal, Mahabubnagar District	9 Km. from NH-44	15 Km. from Jadcherla and 17 Km. from Mahabubnagar Railway Stations	77 Km from Shamshabad Airport. at Hyderabad
Lift-4			
Udandapur Reservoir, Uddandapur Village, Jadcherla Mandal, Mahabubnagar District	7 Km. from NH-44	15Km. from Jadcherla and 20 Km. from Mahabubnagar Railway Stations	77Km. from Shamshabad Airport at Hyderabad

Project Component	Roads	Railway	Airport
Ayacut of Right Main Canal from CommonCanal and South Main canal from Udandapur Balancing Reservoir	Passing through NH-44	Accessible from Jadcherla Railway Station	
Ayacut of Left Main Canal of Udandapur Reservoir	31 Km. from NH-44	Accessible from Thandur Railway Station	
Aayacut of Maddur Main Canal and Hanwada Main canal of Udandapur Reservoir	passing through SH-23	18 Km. from Mahbubnagar Railway Station	
Lift-5			
Pump House at Padmaram Village, Chowderdudem Mandal, Rangareddy District	30 Km. from NH-44	43Km. from Vikarabad and 30 km Shadnagar Railway Stations	64Km. from Shamshabad Airport at Hyderabad
K P Laksmidevipally Reservoir located Padmaram Village, Chowderdudem Mandal, Rangareddy District	30Km. from NH-44	43Km. from Vikarabad and 30 km from Shadnagar R.S.	64 Km. from Shamshabad Airport at Hyderabad
Ayacut of East and South Main Canals of K P Laksmidevipally Reservoir	Passing through NH-44	Accessible from Shadnagar Railway Station	
Ayacut of North Main Canal of K P Laksmidevipally Reservoir	15 Km. from NH-9/S.H-20	Accessible from Vikarabadand Shadnagar Railway Stations.	

2.2 SALIENT FEATURES

The salient features of the project are presented in table below.

Table 2.2: Project Salient Features

S.N.	Features	Description
A	**HEADWORKS**	
(i)	Source of the project	Srisailam Reservoir across River Krishna
(ii)	Location	Near Yellur village, Kollapur mandal, Mahabubnagar Dist. Telangana State
(iii)	Longitude	16^0-5' N
(iv)	Latitude	78^0-54 'E
(v)	Catchment area	79,530 sq. miles
(vi)	Design flood	19 lakhs cusecs.
(vii)	Deep bed level	152.4 m
(viii)	Min. T.W. L	163.00 m
(ix)	Max. Flood level Observed at the dam	187.25 m
(x)	Type of dam	Gravity Dam
(xi)	Top elevation	275.525 m
(xii)	Height of dam from deepest foundation level	143.26 m
(xiii)	Total length at Top	512.0 m
(xiv)	Max. discharging capacity over the crest	37,356 cumecs

S.N.	Features	Description
B	**ANJANAGIRI RESERVOIR**	
(i)	Location	Narlapur (V), Kollapur(M)
(ii)	Longitude	78° 22' 46"
(iii)	Latitude	16° 08' 10"
(iv)	TBL	348.500 m
(v)	FRL	345.000 m
(vi)	MDDL	325.250 m
(vii)	Dead Storage	0.56 TMC
(viii)	Live Storage	7.95TMC
(ix)	Catchment Area	9.860sq. Km
(x)	Max. Height of Bund	74.0 m
(xi)	MFD	92.665 cumecs
(xii)	Ayacut	
C	**VEERANJANEYA RESERVOIR**	
(i)	Location	Yedula Village, Gopalpet Mandal
(ii)	T.B. L	+ 450.000 m
(iii)	F.R. L	+ 445.000 m
(iv)	M.D.D. L	+ 436.250 m
(v)	Top Width	6.00 m
(vi)	Dead Storage	0.595 TMC
(vii)	Live Storage	5.955 TMC
D	VENKATADRI RESERVOIR	
(i)	Type of Dam	Earthen Dam
(ii)	TBL	+546.000 m
(iii)	FRL	+542.000 m
(iv)	MDDL	+513.140 m
(v)	Sill level for link and irrigation canal	+510.550 m
(vi)	Total /Gross capacity	16.74 TMC
(vii)	Storage at MDDL	0.57 TMC
(viii)	Storage above MDDL	16.24 TMC
(ix)	Total length of bund including hillocks	15.230 km
(x)	Net Length of Bund	14.75 km
(xi)	Max. Height of Bund	57.00 m
(xii)	Catchment Area	17.623 Sq.km.
(xiii)	M.F.D.	143.62 cumec
(xiv)	Ayacut	53846 ha
E	**KURUMURTHYRAYA RESERVOIR**	
(i)	Location	Karvena (V), Bhoothpur(M)
(ii)	Type of Dam	Earthen Dam
(iii)	TBL	535.50 m
(iv)	FRL	531.00 m
(v)	MWL	531.90 m
(vi)	Capacity @ FRL	17.34 TMC
(vii)	MDDL for irrigation canal	490.25 m
(viii)	MDDL for Pumping	512.00 m
(ix)	MFD	357.67 cumec
(x)	Capacity below MDDL +490.25 M	0.710 TMC
(xi)	Capacity at Sill level +488.300 M	0.515 TMC

S.N.	Features	Description
	@LLc	
(xii)	Capacity above MDDL	16.63 TMC
(xiii)	Length of Earthen Bund i/c hillocks	14.125 km
(xiv)	Max. Height of Bund @ 3.700 km	61.00 m
(xv)	Ayacut	73,684 ha
(xvi)	Catchment Area	33.41sq .km
F	**UDANDAPUR RESERVOIR**	
(i)	Location	Udandapur (V) Jadcherla (M)
(ii)	TBL	+634.000 m
(iii)	FRL	+629.000m
(iv)	MWL	+629.900m
(v)	Capacity @ FRL	16.03 TMC
(vi)	MDDL for common main canal	+607.250m
(vii)	MDDL (for Pumping)	+610.000m
(viii)	Capacity below MDDL +590.30 M	0.45 TMC
(ix)	Capacity below Sill level +588.250 M	0.27 TMC
(x)	Capacity above MDDL	15.58 TMC
(xi)	Length of Earthen Bund i/c hillocks	15.825 km
(xii)	Net length of Earthen bund	15.575 km
(xiii)	Max. Height of Bund	57.595 m
(xiv)	Catchment Area	16.962 m
(xv)	MFD	139.156 cumec
(xvi)	Ayacut	2,03,239 ha
(xvii)	Submergence Area	4860 ha
G	**K P LAKSMIDEVIPALLE RESERVOIR**	
(i)	TBL	673 m
(ii)	FRL	670 m
(iii)	MWL	670.90 m
(iv)	Capacity @ FRL	2.80 TMC
(v)	MDDL for irrigation canals	651.00 m
(vi)	Capacity below MDDL +646.600	0.54 TMC
(vii)	Length of Earthen Bund	6.050 km
(viii)	Max. Height of Bund	51 m
(ix)	Ayacut	167,207 ha
(x)	Free catchment	8.658 sq km
(xi)	MFD	84.028 cumec
H	**IRRIGATION**	
(i)	Gross Command Area (GCA)	8,83,945 ha
(ii)	Culturable Command Area (CCA0	4,97,976 ha
(iii)	District wise GCA /CCA/number of villages	
(iv)	Mahabubnagar	178743ha / 95271 ha/247
(v)	Rangareddy	242,358ha / 145,363ha/330
(vi)	Vikarabad	253,015ha / 138,442ha/417
(vii)	Nagarkurnool	69,839ha / 41,858ha/61
(viii)	Nalgonda	20,827ha/ 11,878ha/16
(ix)	Narayanpet	119162 ha/65164 ha/155
(x)	Number of Village/ Mandal	1226/70

S.N.	Features	Description				
	Benefitted					
(xi)	Existing Cropping Pattern					
(xii)	Kharif	3,56,944 ha (71.68%)				
(xiii)	Rabi	44,660 ha (8.97%)				
(xiv)	Annual	4,01,604ha (80.65%)				
(xv)	Proposed Cropping Pattern					
(xvi)	Kharif	4,95,835ha (99.57%)				
(xvii)	Rabi	77,887 ha (15.64%)				
(xviii)	Annual	5,73,722ha (115.20%)				
I	**CANALS**					
(i)	Type of Canals	Trapezoidal Lined Canals				
(ii)	Nunber of Main canals/Length	13No./915.47 km				
(iii)	Canal wise length/CCA/					
(iv)	CANAL NAME	Length(km)	CCA (ha)	Q(cumec)	B.W.(m)	FSD(m)
	Venkatadri Low Level Canal	29.60	6,478	7.035	5.80	1.30
	Venkatadri Main Canal	152	47,368	47.84	14.40	2.80
	Kurumurthyraya High Level Canal	108	61,134	62.68	16.50	3.00
	Kurumurthyraya Left Low Level	36	12,551	12.99	7.75	1.55
	Hanwada Canal	22.74	11775	8.02	3.10	1.90
	Madur Canal	113.2	69601	68.75	15.50	3.00
	Udandapur 1R-Main Canal	4.6	3,644	3.887	5.00	1.20
	Udandapur 2R-Main Canal	72	57,490	63.04	11.00	3.60
	Udandapur Left Main Canal	137.73	48,583	130.61	17.00	5.00
	Udandapur South Main Canal	25	12,146	15.000	6.00	1.75
	KPL East Main Canal	106	81,296	97.712	14.00	4.10
	KPL North Main Canal	89	72,065	72.832	13.00	3.37
	KPL South Main Canal	19.6	13,846	15.04	5.25	2.10
J	**PROJECT COST**					
(i)	UNIT - I: Head Works- Main Conduit System	Rs. 55,086.57 Crores				
(ii)	UNIT - II: Canal and Distribution system					
(iii)	UNIT - III: Power to Pumping Stations					
(iv)	Total Cost (Unit -I +Unit-II +Unit-III)	Rs. 55,086.57 Crores				
(v)	B.C. Ratio	1.26:1				

2.3 COMMAND AREA OF THE PROJECT

Water from Krishna River will be lifted initially to Anjanagiri reservoir and then to Veeranjaneya reservoir. However, no command area is likely to be benefited with these two reservoirs. From Veeranjaneya reservoir, water will be lifted to Kurumurthiyraya reservoir and will be carried to

command areas in parts of Mahabubnagar district through right and left main canals. Thereafter, it's proposed to lift the water to the command areas in Mahabubnagar, Narayanpet, Nalgonda, Rangareddy, Vikarabad, Nagarkurnool districts through 13 main canals, which have a combined GCA and CCA 8,83,945 ha and 4,97,976 ha respectively.

2.3.1 Gross Command Area (GCA)

The gross command area under Pase -II of PRLIS is sprawled over six districts namely Mahabubnagar, Narayanpet, Nagarkurnool, Rangareddy, Vikarabad and Nalgonda in Telangana State. The command area villages are spread over 13 mandals (247 villages) in Mahabubnagar district, 9 mandals (155 villages) in Narayanpet,20 mandals (330 villages) in Rangareddy, 18 Mandals (417 villages) of Vikarabad district, 8 mandals (61 villages) of Nagarkurnool district and only2 mandals (16 villages) in Nalgonda district. Majority (28.62%) of the GCA is in Vikarabad district and is followed by districts Rangareddy (27.42%), Mahabubnagar (20.22%), Narayanpet (13.44%), Nagarkurnool (7.90%) and Nalgonda (2.36%) respectively. The district wise command coverage in terms of number of mandals and villages and GCA is presented in **Table 2.3.**

Table 2.3: District wise coverage of GCA

S No	District	No. of Mandals	No. of Villages	GCA (ha)	% of Total GCA(ha)
1	Mahabubnagar	13	247	178,743	20.22
2	Narayanpet	9	155	119,162	13.48
3	Nagarkurnool	8	61	69,839	7.90
4	Nalgonda	2	16	20,827	2.36
5	Rangareddy	20	330	242,358	27.42
6	Vikarabad	18	417	253,015	28.62
Total		**70**	**1226**	**8,83,945**	**100.00**

2.3.2 Cultivable Command Area (CCA)

The project command is spread over five districts of the state of Telangana located in Southern peninsular India. The topography of the proposed command areas is mostly undulating and is characterized by ridges and valleys, isolated hillocks and plane topography. The general slope of the land is from West to East and South East. Isolated hills and hill ranges are also present in the command areas. The average elevation in the command area of the project is over 500 m. The Cultivable Command Area (CCA) of the project is assessed to 497,976 ha after accounting for areas not available for cultivation in the GCA. Thus, about 56.34% of GCA is available for cultivation and/or irrigation under the project. District wise abstract of command area is given in **Table 2.4**

Table 2.4: District wise CCA

S No	District	GCA (ha)	CCA (ha)	% CCA to GCA
1	Mahabubnagar	178,743	95,271	53.30
2	Narayanpet	119,162	65,164	54.68
3	Nagarkurnool	69,839	41,858	59.93
4	Nalgonda	20,827	11,878	57.03
5	Rangareddy	242,358	145,363	59.98
6	Vikarabad	253,015	138,442	54.72
Total		**8,83,945**	**497,976**	**56.34**

40.81%of the total CCA area will be irrigated by the six main canals of Udandapur with combined CCA of 2,03,239 ha, followed by K P Lakshmidevipally Reservoir with 167,207 ha (33.57%), Kurumurthiyraya Reservoir with73,684 ha (14.80%), and 53,846 ha (10.81%) by Venkatadri Reservoir. Two reservoirs viz., Lakshmidevipally Reservoir and Udandapur Reservoir account for over 74.38 % of total net command area of project. Reservoir and main canal wise gross and net command areas of PRLIS is presented **in Table 2.5.**

Table 2.5: Reservoir and Main Canal wise GCA and CCA of PRLIS

RESERVOIR	CANAL NAME	GCA, ha	CCA, ha	% CCA to GCA
VENKATADRI	Venkatadri Low Level Canal	10,598	6,478	61.12%
	Venkatadri Main Canal	71,541	47,368	66.21%
VENKATADRI Total		**82,139**	**53,846**	**65.55%**
KURUMURTHYRAYA	Kurumurthyraya High Level Canal	116,634	61,134	52.42%
	Kurumurthyraya Left Low Level Canal	21,874	12,550	57.38%
KURUMURTHYRAYA Total		**138,508**	**73,684**	**53.20%**
UDANDAPUR	Hanwada Canal	21,573	11,775	54.58%
	Madduru Canal	127,512	69,601	54.58%
	Udandapur 1R-Main Canal	8,876	3,644	41.05%
	Udandapur 2R-Main Canal	102,495	57,490	56.09%
	Udandapur Left Main Canal	96,383	48,583	50.41%
	Udandapur South Main Canal	24,486	12,146	49.60%
UDANDAPUR Total		**381,325**	**203,239**	**53.3%**
K.P LAKSHMIDEVIPALLY	KPL East Main Canal	127,207	81,296	63.91%
	KPL North Main Canal	135,539	72,065	53.17%
	KPL South Main Canal	19,226	13,846	72.02%
KPL Total		**281,973**	**167,207**	**59.30%**
Grand Total		**883,945**	**497,976**	**56.34%**

2.3.3 CCA By Districts

Of the total CCA of 497,976 ha, major part i.e., 29.1 % is in Rangareddy district. Likewise, the major part of the command (40.8%) is irrigated from Udandapur reservoir through its six proposed main canals. District and reservoir wise CCA of project is presented in **Table 2.6.**

Table 2.6: District & Reservoir wise Culturable Command Area

District	Reservoir				Total	
	Venkatadri	Kurumurthiraya	Udandapur	KPL	Area, ha	%
Mahabubnagar	13,047	27,492	44877	9,855	95,271	19.13
Narayanpet	0	46,192	18,972	0	65164	13.08
Nagarkurnool	24,195	0	17,663	0	41,858	8.4
Nalgonda	9,828	0	0	2,051	11,878	2.4
Rangareddy	6,777	0	22,776	115,811	145,363	29.1
Vikarabad	0	0	98951	39,491	138,442	27.8
Total	**53,846**	**73,684**	**203,239**	**167,207**	**497,976**	**100.0**
%	**10.81**	**14.8**	**40.8**	**33.58**	**100.0**	

2.4 BRIEF DESCRIPTION OF PROJECT COMPONENT

The works under Phase-I, primarily involves construction of series of approach channels, open canals, tunnels, pump houses and reservoirs for conducting water to various stages of lift and storing it for consumptive use in drinking water, industrial uses and irrigation. The description for various stages of lift is given in following sub-section.

2.4.1 Lift-1

The Approach channel starts from foreshore of the Srisailam Reservoir and the length of the approach channel is 2.205km. The depth of cut varies from 0.00 m to 49.00 m in length of 2.205 km at the location of Intake structure. The radius of curvature adopted is 1000 m to minimize land acquisition **(Table 2.7).**

Table 2.7: Salient Features of Approach Channel

Particulars	Running 8 pumps
Discharge (Required)	984.00 cumecs
Discharge (Designed)	986.30 cumecs
Bed width	52.0 m
FSD	10.00 m
Free Board	1.00 m
Bed fall	1 in 4350
Side slope	0. 5: 1
Coefficient of Rugosity	0.035
Velocity	1.650 m/sec

The length of the tunnel is 0.876 m. The bottom level of the intake structure is +218.840 and top level of the structure is +273.000. The tunnel intake structure consists of gates, bell mouth chamber, gate chamber, trash track, gate grooves and hoist mechanism. Main purpose of the

structure is smooth maintenance of main tunnel. In tunnel intake structure return walls, side return walls and wing walls are provided. As per the ERM data at tunnel intake structure, good rock is available.

Pumping Station:

First Stage Pumping Station (Anjanagiri Pumping Station) is located at Anjanagiri reservoir near Narlapur village, Kollapur mandal, Nagarkurnool district. In this pumping station, 8 pumps and one standby pump having a rating of 145 MW for each pump are proposed to be installed, to draw water from back waters of Srisailam reservoir with MDDL at EL. of + 250 m, by gravity through 2.205 km open canal and 0.876 m tunnel and filled in Anjanagiri balancing reservoir near Narlapur at FRL of + 345.00 m. At this pumping station water is pumped to a static head of 104 m and discharge of each pump will be 85 cumec (3000 Cusecs). Total discharge by all pumps will be 2.0 TMC /day. Power demand for all 8 pumps will be about 1160 MW and energy consumption will be about 1,223 million units per year.

2.4.2 Lift-2

The length of approach is about 2.650 km. The key Hydraulic particulars are tabulated in **Table 2.8.**

Table 2.8: Hydraulic particulars of Lift-2 Approach Channel

Features	
Discharge	984 cumec
Bed Width	15.00 m
F.S. D	20.25 m
Side Slopes	0.5:1 in Hard Rock
	1.5:1 in All Soils
Bed Fall	1 in 4300
n (Rugosity) Coefficient)	0.035

The length of Open Canal is about 5.925 km. The Hydraulic particulars are tabulated in **Table 2.9.** Berms are proposed at every 10 m interval wherever the depth of cutting is found to be more than 10 m.

Table 2.9: Hydraulic particulars of Lift-2 Open Canal

Features	
Discharge	656 cumec
Bed Width	12.00 m
F.S.D	20.00 m
Side Slopes	0.5:1 in Hard Rock
	1.5:1 in All Soils
Bed Fall	1 in 12000
n (Rugosity Coefficient)	0.035

Second Stage Pumping Station (Veeranjaneya Pumping Station) is located at Veeranjaneya reservoir near Tegalapally village, Kodair mandal, Nagarkurnool district. In this pumping station 9

Nos. pumps each of 145 MW rating are being installed and further an additional standby pump to draw water from back waters of Anjanagiri balancing reservoir with MDDL at 325.250 m, by gravity, through 5.925 km open canal and 15.891 km tunnel and filled in Veeranjaneya balancing reservoir near Yedula at FRL +445.00 m. At this pumping station water is pumped to a height of 124 meters discharge of each pump will be 75 cumecs (2,650 cusecs). Total discharge by all pumps will be 2 TMC / day. Power demand of all the pumps will be about 1305 MW and energy consumption will be about 1506 million units per annum.

From this reservoir, 30 TMC @ 0.5 TMC/day of water will be taken to fill Upper Dindi balancing reservoir to meet the ayacut in Nalgonda district and balance 90 TMC of water @ 1.5 TMC/ day will be taken to Stage-3 pumping station near Vattem village.

2.4.3 Lift-3

The length of approach canal is about 3.30 km, whereas the length of open canal is about 3.10 km. The Hydraulic particulars are tabulated in **Table 2.10** and **Table 2.11**.

Table 2.10: Hydraulic Particulars of Lift-3 Approach Channel

Features	
Discharge	984 cumec
Bed Width	30.00 m
F.S.D.	11.25 m
Side Slopes	0.5:1 in Hard
	1.5:1 in All other Soils
Bed Fall	1 in 2200
n (Rugosity Coefficient)	0.035

Table 2.11: Hydraulic Particulars of Lift-3 Open Canal

Features	
Discharge	656 cumec
Bed Width	18.00 m
F.S.D.	11.00 m
Side Slopes	0.5:1 in Hard Rock
	1.5:1 in All Soils
Bed Fall	1 in 1810
N (Rugosity Coefficient)	0.035

Third Stage Pumping Station (Venkatadri Pumping Station) is located at Venkatadri reservoir, near Vattem village, Bijinepally mandal, Nagarkurnool district. In this pumping station 9+1 Nos. pumps of 145 MW (145000KW) rating is being installed to draw water from back waters of Yedula balancing reservoir with MDDL at EL. +436.250 M, by gravity, through 6.40 Km open canal and 21.475 Km tunnel and filled in Venkatadri balancing reservoir near Vattem at FRL +542.00 M. At this pumping station water is pumped to a height of 121 M and discharge of each pump will be 75 Cumecs (2,650 Cusecs). Total design discharge by all pumps will be 2 TMC/day. Power demand of all pumps will be about 1305 MW and energy consumption will be about 1484 million units per year.

From this reservoir 30 TMC @ 0.5 TMC/day of water will be taken to meet the ayacut in Nalgonda district and balance 60 TMC of water @ 1.5 TMC/day will be taken to Stage-4 pumping station near Udandapur.

2.4.4 Lift-4

Approach channel is proposed from km 1.525 to km 0.090 in the Karvena reservoir **(Table 2.12).** Head regulator proposed at km. 0.350. With sill level +503.00, The canal is designed with side slope 0.5:1 for rock cutting. The discharge is taken as 1.5 time's normal discharge. The Hydraulic particulars are provided in **Table 2.12.**

Table 2.12: Hydraulic Particulars of Lift-4 Approach Channel

Sl. No.	Features	Description
1.	Discharge required	565.50 cumecs
2.	Discharge designed	594.559 cumecs
3.	Bed width	41.00 M
4.	F.S.D.	9.25 M
5.	Free Board	1.0 M
6.	Value of "n"	0.035
7.	Side slopes (I/O)	0.5:1
8.	Bed Fall	1 in 5740- (Surface Fall)
9.	T.W. of Banking(L/R)	-
10.	Bed Level	+503.000 M
11.	F.S.L.	+512.250 M
12.	T.B.L.	+513.250 M
13.	G.L.	+532.595 M

Open gravity canal is designed for 377 cumecs (i. e 1.15 TMC per day). Open canal is proposed from km 0.090 to km 0.200 with surface fall 1 in 2800 **(Table 2.13).**

Fourth Stage Pumping Station is located near Udandapur village, Jadcherla mandal, Mahaboobnagar district. In this pumping station 5 nos. pumps of 145 MW (145000KW) rating are being installed to draw water from back waters of Karvena balancing reservoir (Which will be fed from Vattem balancing reservoir) with MDDL at EL.+515.00 M, by gravity, through Approach channel 1.435 km and 8.935 Km tunnel and filled in Udandapur balancing reservoir at FRL +629.00 M. At this pumping station water is pumped to a height of 122 M and discharge of each pump will be 75 Cumecs (2,650 Cusecs). Total discharge by all pumps will be 1.0 TMC /day. Power demand of all pumps will be about 725 MW and energy consumption will be about 807 million units/year.

From this reservoir 10 TMC @ 0.5 TMC/day of water will be taken to meet the ayacut in Mahaboobnagar and part of Ranga Reddy districts and 7.15 TMC of water will be taken to twin cities reservoirs to meet the drinking water needs of Hyderabad and Secunderabad. Balance water @ 0.5 TMC/day will be taken to pumping station near K.P Lakshmidevpally.

Table 2.13: Hydraulic Particulars of Lift-4 Open Channel

Sl. No.	Features	Description
1.	Discharge required	377.000 Cumecs
2.	Discharge designed	382.588 Cumecs
3.	Bed width	19.00 M
4.	F.S.D.	9.00 M
5.	F. B	1.0 M
6.	Value of "n"	0.035
7.	Side slopes (I/O)	0.5:1
8.	Bed Fall	1 in 2800
9.	T.W. of Banks (L/R)	5/8
10.	Bed Level	+503.000 m
11.	F.S.L.	+512.000 m
12.	T.B.L.	+513.000 m
13.	G.L.	+532.595 m

2.4.5 Lift-5

Approach channel is proposed from km (-) 0.975 to km 0.000 in the Udandapur Reservoir **(Table2.14**). The common canal runs from 0.00 km to 16.612 km on contour alignment. The sill of common canal is + 600.00 m. The MDDL of Udandapur reservoir works out to 607.25 m. The capacity of Udandapur at MDDL is 0.42 TMC which is not utilizable. The balance ayacut 1,67,207 ha is fed by K. P. Laxshmidevipalli reservoir after km 16.50 by open canal and tunnel. Open Gravity Canal from 16.612 Km to 18.850 Km and a transition from km 18.600 to km 18.850 are proposed for conductor system to lift-V of K.P. Laxmidevipalli reservoir. The surface fall adopted in transition is 1 in 119.047.

Fifth Stage Pumping Station is located near padmaram village, chowdergudem mandal, Ranga Reddy district. In this pumping station 3 nos. pumps of 75 MW (75000KW) rating is being installed to draw water from back waters of Udandapur balancing reservoir with MDDL at EL. +607.25 m, by gravity, through 18.850 Km open canal and 14.400 Km tunnel and filled in K.P Lakshmidevipally balancing reservoir (FRL +670.00 m). At this pumping station water is pumped to a height of 87.5 m and discharge of each pump will be 55 Cumecs (1,945 Cusecs). Total discharge by all pumps will be 0.5 TMC/day. Power demand of all pumps will be about 195 MW and energy consumption will be about 338 million units per annum.

From this reservoir, 30 TMC of water will be taken to meet the maximum ayacut in Ranga Reddy and some part of Nalgonda districts.

Table 2.14: Hydraulic Particulars of Lift-5 Approach Channel

Sl. No.	Features	Description	
1.	Discharge required	523.571	Cumecs

2.	Discharge designed	525.736	Cumecs
3.	Bed width	71.50	M
4.	F.S.D.	7.25	M
5.	F. B.	0.9	M
6.	Value of "n"	0.035	
7.	Side slopes (I/O)	0.5:1	
8.	Bed Fall	1 in 10000	
9.	T.W. of Banks (L/R)	-	
10.	Bed Level	+600.098	M
11.	F.S.L.	+607.348	M
12.	G.L.	+602.275	M
13.	Length of open channel	18.850	Km
14.	Length of tunnel	14.40	Km

2.5 LIVE STORAGES AND PRINCIPAL LEVELS

The live storages of proposed balancing reservoirs are assessed considering the temporal distribution water demand for irrigation and other uses as well as water availability at source. Based on this analysis, requirement of live storage of reservoirs is assessed to be 64.615 TMC (1829.67 MCM) and the reservoir wise MDDL, FRL and live storage are shown in **Table 2.15.**

Table 2.15: Reservoir wise designed MDDL, FRL and live storage.

S. N.	Reservoir	MDDL	FRL	MWL	Live Storage	
					TMC	MCM
1.	Anjanagiri	325.250	345.00	345.90	7.950	225.12
2.	Veeranjaneya	436.250	445.00	445.90	5.955	168.62
3.	Venkatadri	513.140	542.00	542.90	16.24	459.86
4.	Kurumurthiyraya	490.250	531.00	531.90	16.63	470.91
5.	Udandapur	590.300	629.00	629.90	15.58	441.18
6.	K.P Lakshmidevipally	651.000	670.00	670.90	2.26	64.00
Total					**64.615**	**1829.67**

2.6 STATUS OF WORKS UNDER PHASE-I

The work under Phase-I of the Project related to construction of series of approach channels, open canals, tunnels, pump houses and reservoirs for conducting water to various stages of lift from Lift-I upto Lift stage -IV is in progress and by end of October, 2021, approximately 46% work has been completed. The work on Lift-V including construction of K. P Lakshmidevipally reservoir, is yet to be taken up. **Table 2-16** shows the physical and financial progress of work under different Lift stages.

Table 2.16: Status of work under Phase-I of PRLIS

Name of work	Financial (Rs Crore)				Physical (Lakh cum)				
	Estimated Cost	Expenditure Up to 31.10.21	Balance	Progress %	Work	Total Qty	Executed	Balance	Progress %
Lift-I Up to Anjanagiri									
Construction of Pumping Station Stage-1 (8x145MW)	3412.87	688.93	2723.94	20.19%	Earth Work	68.30	45.81	22.49	67.07
					Concrete	4.71	0.43	4.28	9.13
Formation of Anjanagiri Reservoir at Narlapur (V)	747.24	613.79	133.45	82.14%	COT	25.66	25.08	0.58	97.74
					Embankment	240.35	186.21	54.14	77.47
					Rock Toe	6.55	6.55	0.00	100.00
					Filters	6.03	5.59	0.44	92.70
Construction of Approach channel & Open canal 0 to 8.325 km	428.79	348.42	80.37	81.26%	Earth Work	130.00	9.90	120.10	7.62
					Concrete	1.03	0.79	0.24	76.99
Construction of twin Tunnel	1722.94	1378.41	344.53	80.00%	Earth Work	57.95	56.55	1.40	97.59
					Concrete	9.63	2.53	7.10	26.27
Sub-total	**6311.84**	**3029.55**	**3282.29**	**48.00%**					
Lift-II Up to Veeranjaneya Reservoir									
Construction of Pumping Station Stage-2 (9x145MW)	3856.57	1789.09	2067.48	46.39%	Earth Work	47.39	45.32	2.07	95.63
					Concrete	5.09	2.70	2.39	53.05
Formation of Veeranjaneya Reservoir at Yedula (V) & approach channel, open canal including CM & CD works, intake structure from KM.0.000 to KM 6.40	720.81	720.81	0.00	100.00%	Excavation	19.09	17.43	1.66	91.30
					Embankment	117.44	116.88	0.56	99.52
					Rock Toe	2.03	1.76	0.27	86.70
					Filters	5.16	5.16	0.00	100.00
					Concrete	0.21	0.15	0.06	71.43
					Revetment	4.60	4.07	0.53	88.48
Construction of Approach channel (0.00 to3.3 km) & Open canal-2 from 3.3 km to 6.4 km					Earth Work	98.17	95.28	2.89	97.06
					Concrete	0.40	0.27	0.13	67.50
Construction of Tunnel from Km 6.4 to Km 25.40	2135.92	1261.86	874.06	59.08%	Earth Work	86.76	71.69	15.07	82.63
					Concrete	11.98	1.41	10.57	11.77
Sub-total	**6713.30**	**3771.76**	**2941.54**	**56.18%**					
Lift-III Up to Venkatadri Reservoir									
Construction of Pumping Station-Stage-3 (9x145MW)	4087.55	1795.43	2292.12	43.92%	Earth Work	45.57	37.70	7.87	82.73
					Concrete	6.45	1.85	4.60	28.68
Formation of Venkatadri Reservoir bund from	3333.59	2736.29	597.30	82.08%	Excavation of COT	51.64	47.96	3.68	92.87

Name of work	Financial (Rs Crore)				Physical (Lakh cum)				
	Estimated Cost	Expenditure Up to 31.10.21	Balance	Progress %	Work	Total Qty	Executed	Balance	Progress %
Km 0.00 to 16.30 Km					Embankment	884.15	546.79	337.36	61.84
					Revetment,Rock Toe,Sand blanket	66.69	34.90	31.79	52.33
Construction of Approach channel (1.3 km) & Open canal-2 from km. -1.300 to 10.750	444.91	386.60	58.31	86.89%	Earth Work	135.10	121.50	13.60	89.93
					Concrete	1.01	0.54	0.47	53.47
Sub-total	**7866.05**	**4918.32**	**2947.73**	**62.53%**					
KARIVENA									
Formation of Karivena Reservoir bund from Km 0.00 to 14.125 Km	**3237.32**	**2277.52**	**959.80**	**70.35%**	Excavation of COT	45.81	38.02	7.79	82.99
					Embankment	772.32	545.39	226.93	70.62
					Revetment,Rock Toe,Sand blanket	50.64	29.21	21.43	57.68
Lift-IV Up to Udandpur Reservoir									
Construction of Pumping Station-Stage-4 (5x145MW)	3752.32	810.53	2941.79	21.60%	Earth Work	45.16	43.51	1.65	96.35
					Concrete	5.98	1.55	4.43	25.92
Formation of Udandapur Reservoir bund from Km 0.00 to 15.875 Km	3165.25	1360.70	1804.55	42.99%	Excavation of COT	46.20	29.37	16.83	63.57
					Embankment	627.60	301.03	326.57	47.97
					Revetment,Rock Toe,Sand blanket	44.24	15.63	28.61	35.33
Sub-total	**6917.57**	**2171.23**	**4746.34**	**31.39%**					
Grand Total	**31046.08**	**16168.38**	**14877.70**	**52.08%**					

2.7 DESCRIPTION OF WATER CONDUITS BETWEEN RESERVOIRS

The details of water conductor system from one reservoir to another reservoir, the discharge to be lifted and number of pumps required for each stage lifting have been given in **Table 2.17.**

Table 2.17: Reservoir wise Details of Water Conduit and Pumps

Stage	Reservoir	Station Name	Open Canal (km)	Tunnel (km)	No. of Pumps	Stand by Pumps	Discharge of each pump (cumec)
1	Anjanagiri	Anjanagiri	2.205	0.876	8	1	85
2	Veeranjaneya	Yedeula	8.575	15.891	9	1	75
3	Venkatadri	Venkatadri	6.400	21.475	9	1	75
4	Kurumurthiyraya	From Venkatdari	12.050	-	-	-	-
5	Udandapur	Udandapur	1.435	8.935	5	-	75
6	K.P Lakshmidevipally	K.P Lakshmidevipally	19.825	14.400	3	-	55

2.8 MAIN CANAL, DISTRIBUTARY AND MINORS

Under Phase -II the project activities, for which ToR has been issued by the MoEF&CC, New Delhi, shall involve construction of 13 main canals (Total length 915.47 km) and distribution network. The length and canal wise CCA proposed is shown in **Table 2.18.**

Table 2.18: Length and CCA Proposed under Each Canal

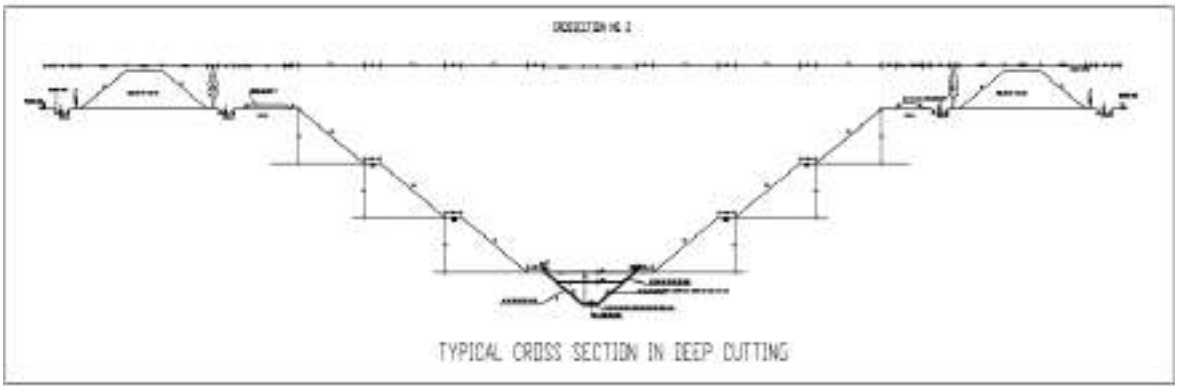
RESERVOIR	CANAL NAME	Length	GCA, ha	CCA, ha
VENKATADRI	Venkatadri Low Level Canal	29.6	10,598	6,478
	Venkatadri Main Canal	152	71,541	47,368
VENKATADRI Total		**181.6**	**82,139**	**53,846**
KURUMURTHYRAYA	Kurumurthyraya High Level Canal	108	116,634	61,134
	Kurumurthyraya Left Low Level	36	21,874	12,551
KURUMURTHYRAYA Total		**144**	**138,508**	**73,684**
UDANDAPUR	Hanwada Canal	22.74	21,573	11775
	Madur Canal	113.2	127,512	69601
	Udandapur 1R-Main Canal	4.6	8,876	3,644
	Udandapur 2R-Main Canal	72	102,495	57,490
	Udandapur Left Main Canal	137.73	96,383	48,583
	Udandapur South Main Canal	25	24,486	12,146
UDANDAPUR Total		**352.53**	**381,325**	**203,239**
K.P LAKSHMIDEVIPALLY	KPL East Main Canal	106	127,207	81,296
	KPL North Main Canal	89	135,539	72,065
	KPL South Main Canal	19.6	19,226	13,846
KPL Total		**214.6**	**281,973**	**167,207**
Grand Total		**915.47**	**883,945**	**497,976**

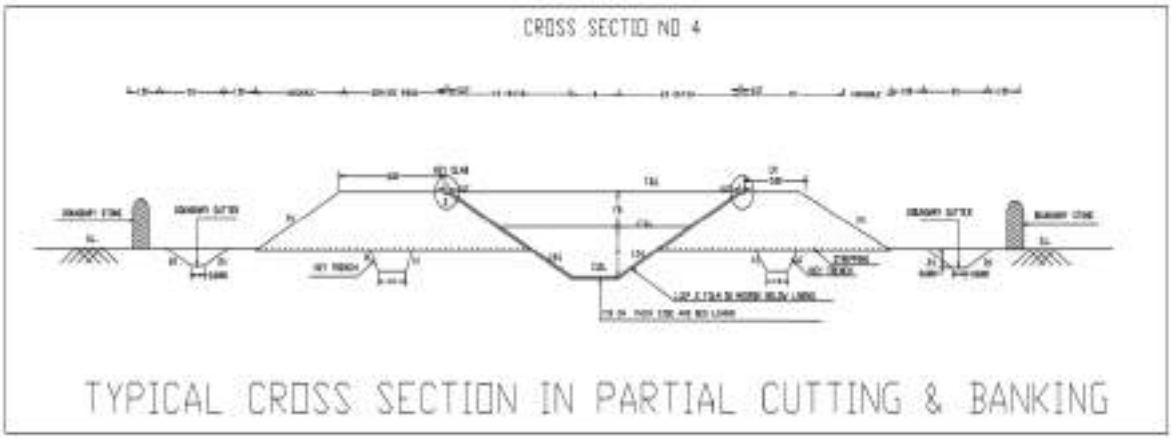
The canals shall be lined andcanal capacity has been fixed on the basis of peak requirement that includes 10% extra for rush irrigation. The canal section has been provided with side slopes, berm width, service road width, free board as per IS 7112: 2002, “Criteria for design of cross

section for unlined canals in alluvial soil. The details of authorised head discharge of canals and with some of the hydraulic parameters at head have been elucidated in **Table 2.19**. Typical canal sections in different situations viz., in deep cutting, in partial cutting and filling(banking) and in full filling(banking) is shown in **Figure 2.2.**

Table 2.19: Details of Authorised Head Discharge and Canal Section at Head

S.N.	Canal Name	Length	CCA (ha)	Q(cumec)	B(m)	FSD(m)
1	Venkatadri Low Level Canal	29.6	6,478	7.035	5.80	1.30
2	Venkatadri Main Canal	152	47,368	47.84	14.40	2.80
3	Kurumurthyraya High Level Canal	108	61,134	62.68	16.50	3.00
4	Kurumurthyraya Left Low Level	36	12,551	12.99	7.75	1.55
5	Hanwada Canal	22.74	11775	8.02	3.10	1.90
6	Madur Canal	113.2	69601	68.75	15.50	3.00
7	Udandapur 1R-Main Canal	4.6	3,644	3.887	5.00	1.20
8	Udandapur 2R-Main Canal	72	57,490	63.04	11.00	3.60
9	Udandapur Left Main Canal	137.73	48,583	130.61	17.00	5.00
10	Udandapur South Main Canal	25	12,146	15.000	6.00	1.75
11	KPL East Main Canal	106	81,296	97.712	14.00	4.10
12	KPL North Main Canal	89	72,065	72.832	13.00	3.37
13	KPL South Main Canal	19.6	13,846	15.04	5.25	2.10





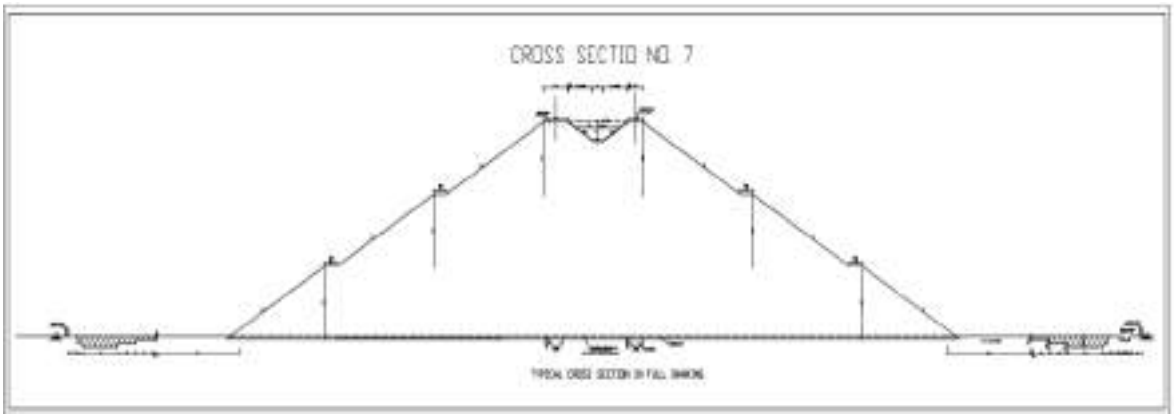


Figure 2.2: Typical Cross Section of Canal

2.9 IRRIGATION PLANNING AND CROPPING PATTERN

The moot point for irrigation planning of a water resource project in an area where monsoon flow of a river has to be harnessed are the water availability for irrigation purpose besides the existing cropping pattern and the proposed cropping pattern, the existing modes of irrigation. Based on the proposed cropping pattern the crop water requirement for area proposed for different crops is computed and month wise requirement are worked out.

2.9.1 Existing Irrigation Facilities In The Command Area

District wise and source wise details of irrigation are given below in **Table 2.20.**

Table 2.20: Existing Irrigation Facilities in Command Area

Sl. No.	District	Net Area (in ha) Irrigated under						
		Canal	Tanks	Tube Wells	Dug Wells	Small Lifts	Others	Total
1	Mahabubnagar/ Narayanpet	415	1,708	26,653	235	17	12	29,040
2	Nagarkurnool	0	94	7,328	105	0	0	7,527
3	Nalgonda	0	0	925	71	0	0	996
4	Rangareddy	0	67	16,251	336	0	0	16,654
5	Vikarabad	467	1,200	10,140	1,627	0	0	13,434
Total		**882**	**3,069**	**61,297**	**2,374**	**17**	**12**	**67,651**
Percentage		**1.3%**	**4.5%**	**90.6%**	**3.5%**	**0.01%**	**0.00**	**100%**

2.9.2 Crops and Their Productivity in The Command

The Pre-project cropping pattern and crop yields, during Kharif and Rabi seasons in the command area of the project are presented in **Table 2.21.**

Table 2.21: Existing Crop and Their Productivity in Command Area

S.N.	Crop	% of CCA	Area (Ha)	Yield / Ha (Kg/Ha)	Total yield (Lakh Tons)
Kharif					
1.	Paddy	10.89	54,230	2356	1.28
2.	Maize	11.27	56,102	2095	1.17
3.	Jowar	4.84	24,118	1244	0.30

4.	Green gram	3.29	16,361	524	0.08
5.	Black gram	1.21	6,012	524	0.03
6.	Red gram	14.31	71,260	524	0.37
7.	Cotton	15.51	77,213	1047	0.80
8.	Castor	4.07	20,281	785	0.16
9.	Vegetables	1.99	9,930	2618	0.26
10.	Others	4.31	21,438	1309	0.28
SUB TOTAL		**71.68**	**3,56,945**		**4.75**
Rabi					
1.	Paddy	3.17	15,794	2880	0.45
2.	Maize	0.33	1,658	2618	0.04
3.	Jowar	0.98	4,874	1047	0.05
4.	Groundnut	2.52	12,569	1047	0.13
5.	Bengal gram	0.38	1,883	785	0.01
6.	Sunflower	0.52	2,574	785	0.02
7.	Safflower	0.20	987	524	0.005
8.	Others	0.87	4,321	655	0.02
SUB TOTAL		**8.97**	**44,661**		**0.75**
GRAND TOTAL		**80.65**	**4,01,606**		**5.50**

2.9.3 Cropping Pattern and Horticulture Practices In The Study Area

Paddy, Maize, Jowar, Green gram, Black gram, red gram, Cotton, Castor and Vegetables are the main crops grown in Kharif season whereas paddy, maize, jowar, groundnut, bengal gram, sunflower and safflower are the main rabi crops in the command area of PRLIS. The gross cropped area in the command area of the project is assessed to be 4,01,606 ha and same accounted for 80.6% of the CCA. The net cropped area in the command area of the project is 3,56,945 ha and cropping intensity without considering current fallows and waste land in the CCA is estimated to be 112.5%**(Table2.22).**

Table 2.22: Existing Cropping Pattern in Command Area

S.N.	Kharif			Rabi		
	Crop	Area (ha)	% of CCA	Crop	Area (ha)	% of CCA
1.	Paddy	54,230	10.89	Paddy	15,794	3.17
2.	Maize	56,102	11.27	Maize	1,658	0.33
3.	Jowar	24,118	4.84	Jowar	4,874	0.98
4.	Greengram	16,361	3.29	Groundnut	12,569	2.52
5.	Blackgram	6,012	1.21	Bengal gram	1,883	0.38
6.	Redgram	71,260	14.31	Sunflower	2,574	0.52
7.	Cotton	77,213	15.51	Safflower	987	0.20
8.	Castor	20,281	4.07	Others	4,321	0.87
9.	Vegetables	9,930	1.99	-	-	-
10.	Others	21,438	4.31	-	-	-
Sub Total		**3,56,945**	**71.68**	**Sub Total**	**44,661**	**8.97**

The agronomist's assessment is that even with the introduction of canal irrigation there may not be any major changes in the proposed cropping pattern as compared to the existing cropping pattern in the command area of the project except for the large-scale introduction of chillies

cultivation both during Kharif and Rabi seasons. The season wise proposed cropping pattern as suggested by the agronomist in the command area of the project is presented in **Table 2.23.**

Table 2.23: Proposed Cropping Pattern

Sl. No.	Crop	% of CCA	Area (Ha)
Kharif			
1.	Maize	19.79	98,533
2.	Chillies	15.54	77,369
3.	Blackgram	6.14	30,559
4.	Redgram	19.44	96,824
5.	Cotton	17.89	89,072
6.	Castor	1.59	7,901
7.	Tomato	12.95	64,488
8	Groundnut	4.32	21,496
9.	Sunflower	1.93	9,595
SUB TOTAL		**99.57**	**4,95,837**
Rabi			
1.	Tomato	4.40	21,888
2.	Groundnut	2.84	14,123
3.	Bengalgram	2.01	9,987
4.	Chillies	6.40	31,888
SUB TOTAL		**15.64**	**77,886**
GRAND TOTAL		**115.21**	**5,73,723**

2.9.4 Crop Water Requirement

For computing crop water requirements Penman – Montieth method has been used and crop water requirements are computed for the crops proposed for cultivation in the command area of this project. The irrigation water requirement of the command area is assessed to be 1443.74 MCM (50.99 TMC) consisting of 1137.04 MCM (40.15 TMC) during Kharif season and 306.70 MCM (10.83 TMC) during Rabi season. Crop wise and season wise irrigation water requirement of the command area of all reservoirs of the project cumulatively presented in **Table 2.24.**

Table 2.24: Irrigation Water Requirement

Sesona and Crop		%	Area, ha	NIR, mm	Total Water Requirement, MCM	Total water Requirement TMC	TMC Proposed Net from Project As SW	TMC Net Required from GW
Kharif								
1.	Maize	19.79	98,533	155.08	152.80	5.40	3.80	1.33
2.	Chillies	15.54	77,369	266.17	205.93	7.27	5.13	1.79
3.	Blackgram	6.14	30,559	55.53	16.97	0.60	0.42	0.15
4.	Redgram	19.44	96,824	315.27	305.25	10.78	7.60	2.65
5.	Cotton	17.89	89,072	293.98	261.85	9.25	6.52	2.27
6.	Castor	1.59	7,901	190.38	15.04	0.53	0.37	0.13
7.	Vegetables	12.95	64488	155.86	100.51	3.55	2.50	0.87
8	Groundnut	4.32	21496	316.42	68.02	2.40	1.69	0.59
9.	Others	1.93	9,595	111.09	10.66	0.38	0.26	0.09

Sesona and Crop		%	Area, ha	NIR, mm	Total Water Requirement, MCM	Total water Requirement TMC	TMC Proposed Net from Project As SW	TMC Net Required from GW
SUB TOTAL		**99.57**	**495,837**		**1137.04**	**40.15**	**28.31**	**9.88**
Rabi								
1.	Vegetables	4.40	21,888	374.98	82.08	2.90	2.04	0.71
2.	Groundnut	2.84	14,123	362.54	51.20	1.81	1.28	0.44
3.	Bengalgram	2.01	9,987	312.52	31.21	1.10	0.78	0.27
4.	Chillies	6.40	31,888	445.95	142.21	5.02	3.54	1.24
SUB TOTAL		**15.64**	**77,886**		**306.70**	**10.83**	**7.64**	**2.66**
GRAND TOTAL		**115.21**	**573,723**		**1443.74**	**50.99**	**35.95**	**12.54**

2.10 COMPONENT OF PRESSURIZED/DRIP IRRIGATION AND MICRO IRRIGATION

Government of Telangana has permitted for implementation of Micro Irrigation Scheme / on Farm Water Management component of National Mission for Sustainable Agriculture (NMSA) since October 2011 vide G.O.Ms. No.251 A&C [Hort] Dept and further as outlined in GO MS No. 28, dated 9 December 2014, Government has decided to promote Micro Irrigation Systems in the area of 1,20,000 Acres with Drip and Sprinklers on 100% subsidy for SC&ST Farmers and with 90% subsidy for Small and Marginal Farmers. TSMIP is being implemented with the assistance from Government of India, State Government and farmer contribution

PRLIS Project aims at improving the economic conditions of the farmers by conserving water, bringing additional area into cultivation with the available water resources, enhancing the crop productivity and production, quality, facilitating judicious usage of ground water, saving in power consumption and cost of cultivation. Sprinkler irrigation is a method of applying water which is similar to natural rainfall but spread uniformly over the land surface just when needed and at a rate less than the infiltration rate of the soil so as to avoid surface runoff from irrigation. This method of irrigation is adopted by farmers owning open or tube well and cultivating horticulture crops like vegetables in the proposed command area of PRLIS. The area covered under the sprinkler irrigation systems in the proposed command area of PRLIS is estimated to be 17,849 ha. In addition, an area of 56,800 ha, command area of PRLIS, is proposed to be covered under this system as part of District Irrigation Plan by 2021. The area covered under the drip irrigation systems in the proposed command area of PRLIS is estimated to be 26,945 ha. In addition, an area of 62,645 ha, command area of PRLIS, is proposed to be covered under drip irrigation system as part of District Irrigation Plan by 2021.

The pressurized irrigation, which is also known as micro irrigation, consists of drip and sprinkler irrigation systems. One of the demand management strategies introduced recently to control water consumption in Indian agriculture is pressurized irrigation or micro irrigation. Under micro-irrigation, unlike flood methods of irrigation, water is supplied at a required interval and quantity using pipe network, emitters and nozzles. Therefore, the conveyance and distribution losses are reduced completely which results in higher water use efficiency under micro irrigation. Incidentally the micro-irrigation also effectively controls the problem of water logging and salinity in the command area of an irrigation project. In view of the above cited advantage

of micro-irrigation over flood irrigation method the Government of India is promoting micro-irrigation in the command area of major and medium irrigation projects. Therefore, it is proposed to provide pressurized irrigation system in 10 percent of command area of PRLIS on a pilot basis. Accordingly, 49,798 ha command area (about 10% of 497,976 ha CCA) of PRLIS is proposed to cover under pressurized irrigation.

Main crops namely Maize, Jowar, Fodder, Pulses, Groundnut, Other oilseeds and Vegetables are in Kharif season Gram, Vegetables, Groundnut and Other oilseeds are suggested in Rabi season and Sugarcane as perennial crop are suggested through channel irrigation in the proposed command area of PRLIS. The sprinkler irrigation system can be introduced for these crops except for Maize, Jowar and Sugarcane. Drip irrigation is suitable for horticulture crops such as Commercial crops, Vegetables, tuber crops, Leafy vegetables and Fruits. Since, drip irrigation is very much familiar in the area the same can be introduced in about 65 percent of area proposed for pressurized irrigation. About 40 percent and 70 percent water will be saved by sprinkler irrigation and drip irrigation systems respectively. With the water saving by introduction of pressurized irrigation can reduce the dependency on groundwater utilization.

2.11 CONJUNCTIVE USE OF WATER FOR IRRIGATION

The available surface water of 82.52 TMC will take care of the irrigation requirement of the command area of the project leaving a surplus of 7.48 TMC if the application efficiency is 100%. However, 100% application efficiency will not be possible. Further, the allocated surface water is just sufficient for irrigating the entire command area with application efficiency of 65.62%.

The total gross water demand, from irrigation, domestic and industrial sectors, including evaporation losses in the project area at source is estimated to be 108.796 TMC while the surface water availability from PRLIS is 90 TMC leaving a gap of 18.80 TMC. Of which, 3.124 TMC is expected to be gross regeneration water from DW and Industrial Supply and balance 15.676 TMC is proposed to be provided from groundwater sources. Of the net ground water requirement for irrigation in the command area of PRLIS is 18.800 TMC and the net groundwater requirement is estimated to be 15.676 TMC assuming 80 percent application efficiency of groundwater. The safe groundwater extraction estimated after the project, in chapter 6, is 34.53 TMC. It is proposed to extract only 15.676 TMC for irrigation which accounts for only 45.4% of safe groundwater extraction. Thus, still about 18.85 TMC can be safely extracted from groundwater sources wherever farmers of command area grow high water consuming crops like paddy instead of ID crops. The groundwater users in the command area will be motivated for installing pressurized micro irrigation equipment for an area of 49,798 ha (10% of total Command) through line department's (i.e., Agriculture and Horticulture) convergence and other extension activities for the existing schemes.

Due to the proposed project, there will be recharge to the groundwater and it may create water logging and drainage problem in the command area in northern part of Mahbubnagar district. Therefore, it is suggested that conjunctive use of the ground water may be encouraged in the command area.

Table 2.25: Surface Water Availability for Irrigating PRLIS Command

Purpose	Overall			Proposed From PRLIS			From GW		
	Net	Losses	Gross	Net	Losses	Gross	Net	Losses	Gross
1. Drinking water	6.500	0.650	7.150	6.500	0.650	7.150	0.00	0.00	0.00
2. Industries	0.300	0.030	0.330	0.300	0.030	0.330	0.00	0.00	0.00
3. Irrigation	50.985	61.070	112.055	35.945	43.055	79.000	15.040	3.760	18.800
4. Evaporation (Jun-Jan)		3.516	3.516		3.516	3.516			
5. Total (1 to 4)	57.785	65.266	123.051	42.745	47.251	**90.00**	15.040	3.760	18.800
6.Regeneration from DW and Industrial Supply	2.499	0.625	3.124				2.499	0.625	3.124
Total (5-6)	55.286	64.641	119.927				12.541	3.135	**15.676**

Water Quantity in TMC

2.12 DOMESTIC AND INDUSTRIAL WATER REQUIREMENT

Water demand norm of the Government of Telangana – 85 litres per capita per day (lpcd) for rural area and 165 lpcd for urban area, is used in computation of current domestic water demand. The projected population of the district in the year 2021 is computed on the basis of decadal growth in population of respective districts between 2001 and 2011. The computation of Industrial water demand is based @ 25% of water demand in urban area sand in rural areas @5 percent of total domestic water demand. It is estimated that 0.325 TMC is required and earmarked for this purpose, details are shown in **Table 2.26.**

Table 2.26: Domestic and Industrial Water Requirement

SN	Particulars	Urban	Rural	Total
1	Population of Project Command area villages (2021)	2,03,175	34,30,571	36,33,746
2	LPCD requirement	165	85	250
3	Annual domestic water requirement in MCM	12.24	106.43	118.67
4	Annual domestic water requirement in TMC	0.43	3.76	4.19
5	Hyderabad City water requirement in TMC	2.31		2.31
6	Total Domestic requirement	2.74	3.76	6.50
7	Total Domestic requirement i/c10% Transmission loss (TMC)	**3.01**	**4.14**	**7.15**
8	Annual industrial water requirement in TMC	0.11	0.19	0.30
9	Total Industrial requirement including 10% Transmission losses	**0.12**	**0.21**	**0.33**
10	Annual domestic and industrial water requirement in TMC	**3.13**	**4.34**	**7.48**

2.13 CONSTRUCTION MATERIAL REQUIREMENT AND SOURCE

Construction materials are required for various project components i.e., series of reservoirs, water conveyor system consisting of gravity canal and tunnel, lift system, CM & CD structures and distributary network system. The construction material needed for this project include cement, sand, coarse aggregates, revetment stones, reinforcement steel and structural steel. The total requirement of materials, the quantity available from works and balance to be procured is shown in **Table2.27** from which it is evident that all stone material and earth for

embankments shall be available from excavation and nothing shall be procured from extraneous source.

Table 2.27: Requirement of Construction Material

Material	Requirement	Available from work	Total Requirement
Phase-I			
COT Filling	12045704	12045704	-
Embankment	239710699	239710699	-
Hearting	34707680	34707680	-
Fine Aggregate	2630205	2630205	-
Fine Filters	8066873	8066873	-
Coarse Aggregate	7209998	7209998	-
Coarse Filters	3437677	3437677	-
Revetment & Rock toe	8756931	8756931	-
Phase-II			
Sand	100.00	100.00	-
Coarse Aggregate	140.00	140.00	-
Boulder/Pitching stone	80.00	80.00	-
Filter material	10.00	10.00	-

2.14 LAND REQUIREMENT FOR THE PROJECT

The total land requirement for entire project shall be 28273 ha comprised of 12483 ha and 15790 ha for Phase-I &Phase-II respectively. The apportionment between Government, Patta and forest land requirement under Phase-I shall be 2768.86 ha, 9508.60 ha and 205.54 ha respectively whereas for Phase-II it shall be 2698 ha, 13092ha and nil ha respectively as shown in **Table 2.28.**

Table 2.28: Land Requirement for Main Canal and Distribution System

S.N.	District	Total Private (Patta) land (ha)	Govt. Land (ha)	Forest land (ha)	Total Land (ha)
Phase-I					
1	PKG-1	29.79	21.05	3.03	53.87
2	PKG-2	488.67	283.50	202.02	974.19
3	PKG-3	171.00	30.50	0.00	201.50
4	PKG-4	90.77	45.68	0.49	136.94
5	PKG-5	114.22	35.35	0.00	149.57
6	PKG-6	1842.75	381.00	0.00	2223.75
7	PKG-7	118.69	63.25	0.00	181.94
8	PKG-8	96.48	41.83	0.00	138.31
9	PKG-9	538.39	44.61	0.00	583.00
10	PKG-10	438.64	160.99	0.00	599.63
11	PKG-11	483.59	51.69	0.00	535.28
12	PKG-12	265.00	49.00	0.00	314.00

S.N.	District	Total Private (Patta) land (ha)	Govt. Land (ha)	Forest land (ha)	Total Land (ha)
13	PKG-13,14,15	1990.35	729.92	0.00	2720.07
14	PKG-16	101.90	40.62	0.00	142.52
15	PKG-17	5.26	673.83	0.00	679.09
16	PKG-18	1284.10	21.04	0.00	1305.14
17	PKG-19	656.00	65.00	0.00	721.00
18	PKG-20	50.00	5.00	0.00	55.00
19	PKG-21	743.00	25.00	0.00	768.00
Total Phase-I		**9508.60**	**2768.86**	**205.54**	**12483.00**
Phase-II					
1	Mahabubnagar	3431	339	0	3770
2	Narayanpet	1051	104	0	1155
3	Nagarkurnool	1430	124	0	1554
4	Nalgonda	200	10	0	210
5	Rangareddy	3679	395	0	4074
6	Vikarabad	3301	1726	0	5027
Total Phase-II		**13092**	**2698**	**0**	**15790**
Total Phase-I& II		**22600.60**	**5466.86**	**205.54**	**28273**

2.15 MANPOWER REQUIREMENTS

Considering the project life cycle involving different components in different locations, no centralized congregation or influx of people is expected. Locally available manpower shall be utilized in the nearest place of work. About 13500 workers (Phase-I:7500; Phase-ii: 6000) would be engaged temporarily during peak construction period. Based upon contract packages labour will be deployed along the entire stretch of the project. About two third of labour is available locally, and shall be hired from the surrounding areas of the project in order to avoid large scale congregation of outside labour. At any given point, the number of people on one work site shall not be more than 300 and will be spread over the entire stretch of project area.

2.16 WATER REQUIREMENT

The total quantity of water required for Phase-I works during construction period is 6275 KLD (5619 KLD for construction purpose and 656 KLD for domestic purpose). The total quantity of water required for Phase-II works during construction period is 5820 KLD (5285 KLD for construction purpose and 535 KLD for domestic purpose). Water requirement during construction stage will be met from groundwater. Necessary permission will be taken from the respected authority.

2.17 POWER REQUIREMENT AND SOURCE

The proposed capacity for the project is 2,944 MW in all the 5 stages of Pumping Stations. The Power consumption of the project is 4,366 million units per annum. As the project is basically a

lift irrigation project there is no power production in this project. Required Power will be supplied by DISCOMS of Telangana.Powerrequirement during construction phase is 90MW per month (75MW for construction and 15MW for domestic requirement).

Power to various lift points is to be availed from the respective power supply authorities. In case of power failure, the power supply required for the lighting, temporary housing and site offices etc, will be met from the DG sets of adequate capacity. The total Fuel required for scheme is 1,03,833 MT.

2.18 CONSTRUCTION SCHEDULE

The project consisting of Reservoirs, tunnels, pump houses, excavation and lining of canals of all links and other structures such as super passages, aqueducts, drops, bridges etc. will be completed in 36 months from the date of signing agreement for different packages.

2.19 PROJECT COST ESTIMATE

The Head wise cost of the project is mentioned in **Table 2.29. The** B.C. Ratio has been assessed as 1.26:1.

Table 2.29: Head wise Project Cost Estimate

Description of Head		Amount (Rs lakh)
A	Preliminary	13,299.52
B	Land	
	i). Acquisition & Compensation	2,55,642.03
	ii). Rehabilitation and Resettlement	59,471.15
C	Works	15,45,877.92
D	Regulators and Measuring Devices	29,891.51
E	Falls	5,848.69
F	Cross Drainage works	1,28,863.82
G	Bridges	67,717.34
H	Escapes	-
I	Navigation works	-
J	Power plant Civil works	-
K	Buildings	4,651.00
L	i). Earthwork	3,46,389.81
	ii). Lining	12,270.94
	iii). Service Road	
	iv). Tunnel	5,48,157.38
M	Plantation	-
N	Tanks and Reservoirs	-
O	Miscellaneous	20,390.00
P	Maintenance	4,030.31
Q	Special T&P	-
R	Communications	-
S	i) Pumphouse Electro mechanical system	8,78,264.71
	ii) Substation and Transmission Works	3,30,051.00
T	Water Supply works	-
U	Distributaries, Minors and Sub minors	1,10,700.00
V	Water courses	18,450.00
W	Drainage	3,175.00
X	Environment and Ecology	69,275.90

Description of Head		Amount (Rs lakh)
	Sub-total I-Works except 'Y'	44,52,418.02
Y	Losses on Stock @ 0.25% of (I-Works -(A+B+O+M+P+Q+X))	10,075.77
	Sub total (A)	**44,62,493.79**
	Establishments charges @ 10% on I-Works less B-lands	**4,14,738.06**
	Tools & Plants @ 1% on I-Works	**44,624.94**
	Suspence (VAT on Civil, O&M Works and E&M Works; Seigniorage Charges; Labour Welfare Cess & NAC)	**5,29,393.65**
	Indirect charges	
i)	Audit & Account charges @ 1% on I-Works	**44,624.94**
ii)	Charges on abatement of cost of Land @ 5% on Culturable Land Cost or 20 times of the Annual Revenue Lost	**12,782.10**
	Sub total of Indirect Charges	**57,407.04**
	Sub total (B)	**10,46,163.69**
	Grand Total (A + B)	**55,08,657.48**
	In Crores	**55,086.57**

CHAPTER 3 DESCRIPTION OF THE ENVIRONMENT

3.1 INTRODUCTION

As a precursor for prediction of various types of environmental impacts likely to arise due to implementation of this project, it is essential to establish the baseline environmental status of the physic-chemical, biological and socio-economic parameters in the project area and within the project influence area.

The information on relevant environmental parameters has been collected through primary and secondary sources in order to understand the present environmental setting of the proposed project site. The major purpose of describing the environmental settings of the study area is:

- To understand the project, need and environmental characteristics of the area.
- To assess the existing environmental quality, as well as the environmental impacts of the future developments being studied; and
- To identify environmentally significant factors or geographical areas that could preclude any future development.

The basic parameter on which data has been collected is as follows:

- Physico-chemical aspects
- Biological aspects
- Socio-economic aspects

3.2 STUDY AREA

The study area comprises of command area of 4,97,976 ha in the upland areas of Mahabubnagar, Narayanpet, Rangareddy, Nagarkurnool, Vikarabad and Nalgonda districts. Baseline data for environmental attributes like ambient air, meteorology, water, water use, hydrology, land use, soil, geology, noise, socio-economic, ecology and biodiversity etc. were collected. The study was conducted during Monsoon, 2019; Post-monsoon 2019 and Pre-monsoon 2020.

3.3 METHODOLOGY OF CONDUCTING BASELINE STUDY

The studies were conducted by considering the following:

- The various environmental attributes were divided into primary and secondary aspects. Primary attributes included air, environment, water, soil, noise, flora and fauna, and micro-meteorology were assessed by conducting field studies, on-site monitoring and review of the past studies conducted;
- Secondary attributes included land use studies, geology, physiological characteristics, and socio-economic environment, and have been assessed by literature review of previous studies conducted by various Government publications etc. A reconnaissance survey was conducted to identify the sampling locations on the basis of:

- Predominant wind directions in the study area as recorded by nearest IMD station for air sampling;
- Locations of villages / towns / sensitive areas for noise, air, socio economics;
- Accessibility of power connection and security for monitoring equipment, pollution pockets in the area;
- Areas that best represent the baseline conditions. During the study a continuous automatic weather monitoring station has established at site to record Wind speed, Wind Direction, Relative Humidity and Temperature. Cumulative Rainfall was monitored by rain gauge on daily basis.

Monitoring of Ambient Air Quality (AAQ), Surface and Ground Water Quality, Soil Quality as well as Noise levels measurements were conducted through M/s. Vison Labs, Hyderabad**.** Environmental monitoring was carried out in accordance with the Terms of Reference issued by the MoEF&CC vide letter No. J-12011/31/31/2017-IA-I (R) dated, 11th October, 2017*)* covering three seasons viz., Monsoon, Post-Monsoon and Pre-Monsoon. Selection of sampling stations followed the criteria laid down by Central Pollution Control Board as well as those adopted by the MoEF&CC, whereas, the number of locations were based on approved ToR issued by MoEF&CC. As such, six sampling location (refer pg.8 of the ToR, section no 6(A), sub-section - ii, iii and v) were selected for the purpose of this study. The details of proposed ayacut area depicting canal network along with the sampling locations are presented in Figure 3-1 and 3-2, respectively.

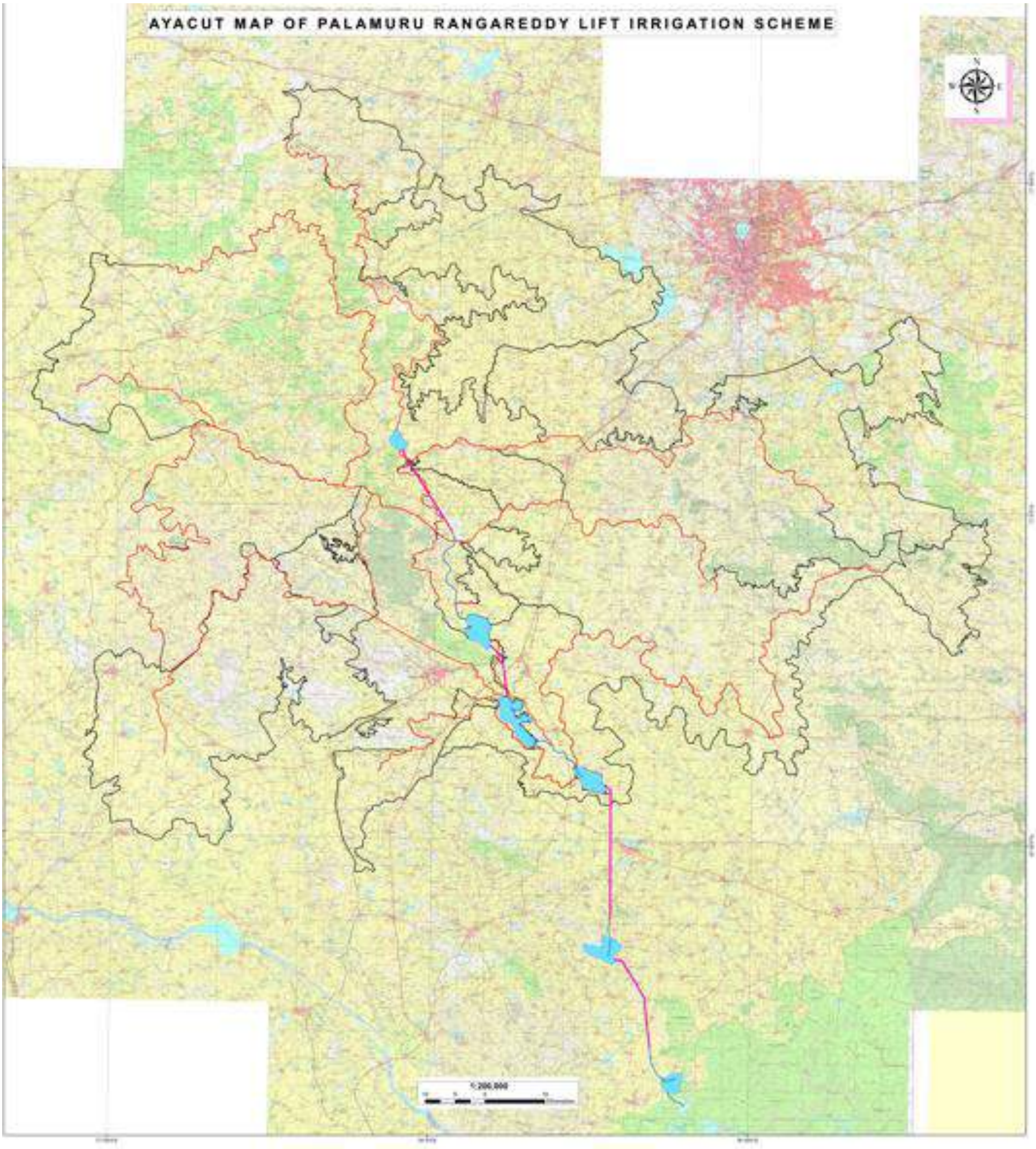


Figure 3.1: Proposed ayacut area with canal network

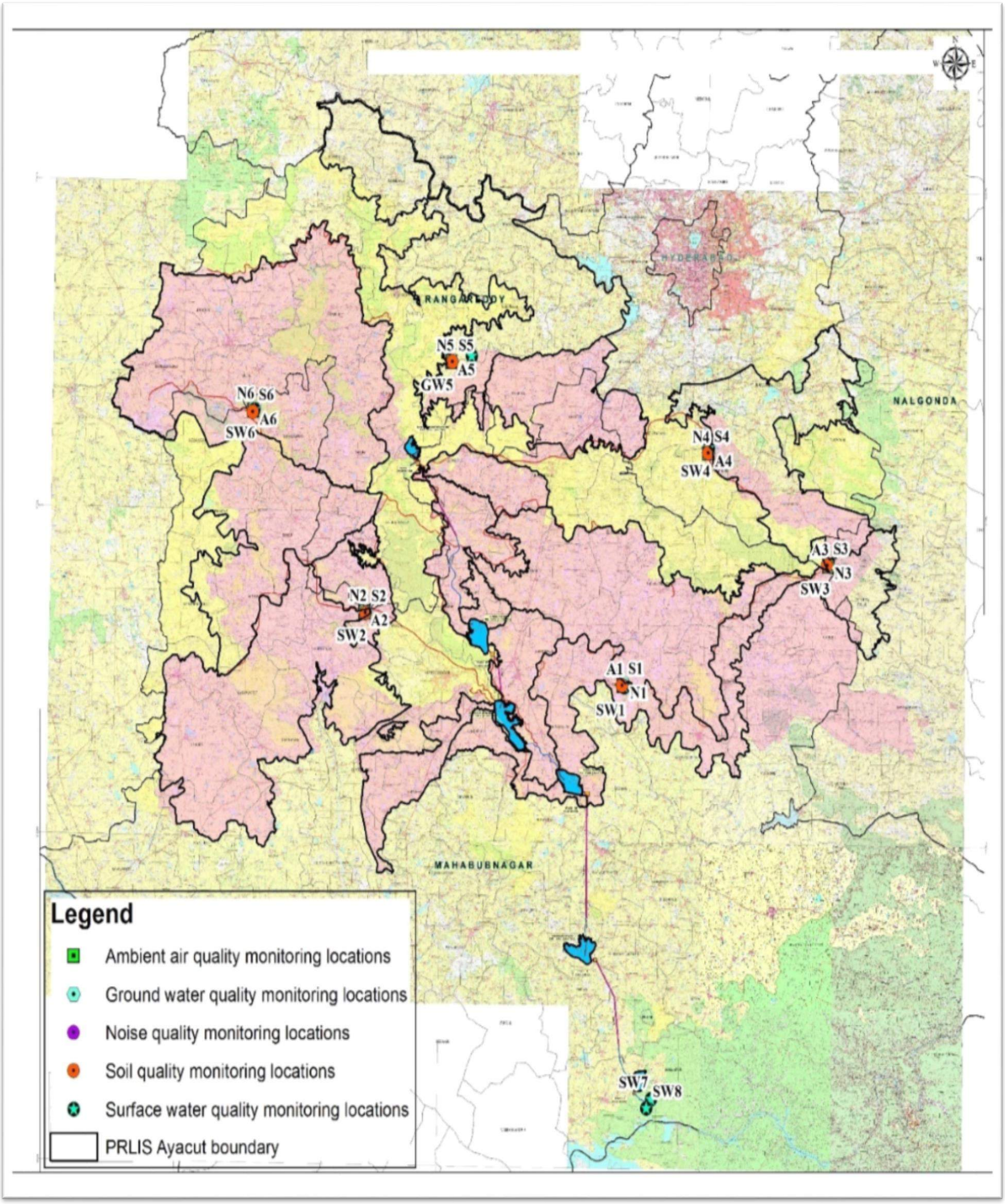


Figure 3.2: Sampling location

3.4 PHYSICO - CHEMICAL ENVIRONMENT

3.4.1 Topography of The Basin and Command Area

a) River Basin

The western edge of the basin is an almost unbroken line formed by the Western Ghats whose height ranges from 600 m to 2100 m. It has the heaviest rainfall and the most humid climate in basin. Hardly 50 to 60 km east of the Ghats lie sparsely cultivated and undulating plains of the Deccan with a dry climate and poor rainfall.

The interior of the basin is a plateau, the greater part of which is at an elevation 300 to 600 m. Its general slope is eastwards. Great undulating plains, divided from each other by flat-topped ranges of hills are some of the main characteristics of this plateau. The hill-sides are marked by conspicuous, wide, terraces except in the southern part where hills are frequently crowned with great 'tors' or rounded hummocks of bare rock, the result of constant weathering.

The Eastern Ghats which forms the eastern boundary of the peninsula are by no means so well-defined or continuous as the Western Ghats. To the south of the Krishna, the Eastern Ghats comprise parallel ranges, which are successive outcrops of an ancient series of stratified rocks.

Except for the hills forming the watershed around the basin, the entire drainage basin of the river comprises rolling and undulating country, a series of ridges and valleys interspersed with low hill ranges. Large flat areas of the type seen in the Indo-Gangetic plains are scarce, except in the delta.

The delta of Krishna formed by deposits at the mouth of the river over past ages consists of a wide belt of river-borne alluvium. The process of silt deposition at the mouth of the river is still continuing and the delta is gradually extending into the sea. (Source: India A Regional Geography, 1971).

Major area of the basin falls under the elevation zone of 500-750 m. highest elevation in the basin is 1903 m.

b) Command Area

The project command is spread over six districts of the state of Telangana located in Southern peninsular India. The topography of the proposed command areas of the project is mostly undulating and is characterized by ridges and valleys. However, some places in the proposed command areas have plane topography. The general slopes of the land are from West to East and South- East. Isolated hills and hill ranges are also present in the command areas of the project. The average elevation in the command area of the project is over 500 meters.

3.4.2 Regional and Local Geology

a) Regional Geology

The project area forms part of a stable shield area composed of cratonic, intra-cratonic and rift controlled sedimentary basins forming different tectonic provinces of Archaean Proterozoic age with subsequent Phanerozoic and a narrow Quaternary cover bordering the inland rivers.

In the area, the Archaean era (4500-2600 Ma) was marked by high geothermal gradients with relatively thin crust, perhaps of mafic composition that was ruptured around 3500 Ma releasing large amounts of tonalite-trondhjemite granites punctuated by emplacements of mafic-ultramafic volcanics all over the globe that eventually formed the nuclei of proto-continents referred to as cratons.

The Indian Peninsular Shield is one such continent composed of a few cratonic nuclei: Dharwar, Bastar, Singhbhum and Aravalli. The continental crust in these nuclei was quite thick while in the intervening areas it was thin and weak - a factor that was responsible for later development of majosixr structural features like rifts, ensialic basins and mobile belts, which became locales of extensive sedimentation and intense deformation and tectono-thermal events that collectively shaped the crustal architecture of the peninsular shield.

The Eastern Tectonic Belt (ETB), part of Dharwar Craton is composed dominantly of tonalitic to granodioritic gneisses with ages of 3000-2600 Ma commonly referred to as Peninsular Gneisses occupying about 40% of the area in the area. With intra-cratonic basins represented by sediments of Meso to Neo Proterozoic Cuddapah, Pakhal, Penganga, Kurnool, Palnad, Sullavai and Bhima sediments in the southeast, north and west and Deccan Traps in the northwest while they abut against the Godavari Graben (Pakhal and Gondwana) in the northeast and Eastern Ghats Mobile Belt in the east.

In the south the gneisses merge with granulite terrain of Karnataka and Tamil Nadu. The cratonic gneisses enclose a few widely separated, N-S trending, narrow and linear greenstone belts (schist belts) consisting of bimodal volcanics, chemogenic and clastic sediments that deposited in fault-bounded linear basins. These schist belts with a general green schist facies metamorphic imprint have an age of around 2900-2700 Ma. The surrounding granite gneisses also have roughly comparable ages. It is believed that this Late Archaean ensemble formed in an environment similar to that of the present-day convergent plate margins and accreted to the craton.

The schist belts and cratonic gneisses were affected by three deformational events probably during 2600-2000 Ma during which the gneisses underwent amphibolite facies metamorphism accompanied by extensive migmatisation and potassic magmatism. on account of multi deformational events and subsequent erosion, the schist belts are preserved in synformal troughs in a vast expanse of granite gneisses and at many places they were completely engulfed by granites. The well exposed schist belts from north to south include Khammam, Yerraballi, Peddavuru, Ghanpur and Gadwal. The Khammam Schist Belt in the northeast represents the remnants of an originally single N-S trending schist belt that got dismembered during the development of the Eastern Ghats Mobile Belt (EGMB) and its subsequent deformation.

The Late Archaean and Early Proterozoic (2600-2000 Ma) precisely, which represents a time of rigorous crustal growth and reworking of older Archaean lithosphere under conditions of high grade metamorphism, witnessed the development of the Karimnagar Granulite Belt This granulite belt which is located north of Karimnagar town was later subjected to the process of Granitisation was originally a part of the Dharwar-Bastar-Singbhum Cratons is constituted of a sequence of repetitively deformed high grade rocks referred to as charnockites and khondalites and their granitised equivalents which are predominantly seen as enclaves (restites) within the PGC. These rocks are of Archaean ancestry, at least in part, but affected and modified by younger tectono-thermal events including granitoid-charnockite intrusions and the granite melts generated from two cycles of high-grade metamorphism, one around 2600 Ma and other 1000 Ma.

The contact between the Cratonic gneisses in the area is a major tectonic feature as borne out by many geological evidences. It is at places marked by gabbro-anorthosite and alkaline plutons of Middle Proterozoic age (1600- 1000 Ma). This testifies that plate tectonics, normally considered being in operation only during the last 200 Ma was operative in some primitive form even during the Proterozoic. Contemporary ideas on granulite belts-indicate that the EGMB most probably represents the lower crust of about 30 km depth that is exhumed to its present level by some form of thrusts tectonics associated with continent-continent collision or under-plating of an oceanic plate. The geological record for the period between 2600 Ma and 2000 Ma is poorly preserved or absent. This profound unconformity is universally known as the Great Eparchaean Unconformity.

By around 2000 Ma, the Dharwar Craton and the EGMB in its primitive form were in existence and from the general structural trends observed in these crustal segments, it is deciphered that a general E-W compressive force was prevailing during this period. These forces and possibly some pre-existing major fractures in the craton led to the evolution of the intra-cratonic Cuddapah Basin. Around the same time, the NW-SE trending Godavari Graben also came into being in which the Pakhal and Sullavai sediments were laid down.

Following the intense dyke activity (1900 Ma- 1700 Ma) involving dilational tectonics, sedimentation in Pakhal Basin commenced around 1700 Ma. In the Pakhal Basin, the early phase of deposition of sedimentation was accompanied by intermittent volcanic activity of basic, acid and barium rich phases. The strata were deposited all along the basin with the peripheral basement rocks forming high ground, which continued up to 1000 Ma when orogenic movements in the EGMB caused intense deformation of these rocks and also thrusted the intervening cratonic gneisses over them. The Pakhal Basin was characterized by the absence of volcanism which is an unusual feature for a rift-controlled basin. The Pakhals also were intensely deformed and transacted by numerous fault systems, some of which are active even now.

The Pakhal and Cuddapah Basins which are remarkably similar in several respects were probably connected during a substantial part of their evolution. In fact, the intervening area between the Pakhal and Cuddapah Basins exposes several discrete slivers of identical lithology all along a major fault/thrust which links the eastern margin of the Cuddapah Basin with the south-eastern margin of the Pakhal Basin.

During the Meso to Neo-Proterozoic time's crustal accretion was perhaps at its peak aided by extensional tectonics and high perturbed geotherms in the mantle. A manifestation of this is the widespread basic plutonism seen in the carton, mobile belt and, to some extent, in the Proterozoic basins. Kimberlite intrusions and lamproitic intrusions within the eastern half of the Cuddapah Basin are related to this. The post-Pakhal tectonic movements in the peninsula resulted in extensive folding, faulting and uplifting of the Proterozoic sediments in the south-eastern part of the Pakhal Basin. This was followed by the evolution of the Sullavai and Bhima Basins during 900-600 Ma.

After the deposition of the Sullavais and Bhimas and their uplift, there was a great hiatus in the stratigraphic history of the area extending for about 300 million years. At the end of the Paleozoic era, i.e., towards the Late- Carboniferous, Gondwana sedimentation commenced over the super-continent known as the Gondwana land comprising the present continents of Australia, India, Africa, South America and Antarctica. In the project area the deposition of the Gondwana sediments was confined to the NW-SE trending faulted trough (Godavari Graben) along the Pranhita-Godavari Valley. Inland drainage discharged its sediments into this new basin, which extended from Asifabad in the northwest in Telangana to Eluru in A.P. in the southeast.

The Gondwana sedimentation began with a glacial climate. The bulk of the strata, deposited since the desiccation of glacial conditions were laid down as a thick series of fluviatile and lacustrine sediments with intercalated plant remains which were ultimately converted into seams of coal. By the end of early Cretaceous (150 Ma) India got separated from the Gondwana land and commenced its northward journey by opening and spreading of the Indian Ocean under the influence of plate tectonics as a result of which the Bay of Bengal was formed.

The northward drift of India continued till its collision against the Eurasian plate around 65 Ma giving birth to the mighty Himalayas and triggering prolific outpourings though long narrow fissures of enormous volumes of lava that flowed as nearly horizontal sheets occupying large areas of western, central and southern India.

These are basaltic in composition and are commonly known as the Deccan Traps which are seen in the area to the west and northwest of Hyderabad prior to and intermittently during the eruption of lavas, there came into being some streams and freshwater lakes in which fluviatile and lacustrine deposits like sandstone, marl and limestone were deposited. These are the "intra-trappeans" and "inter-trappeans". The association of fossil algae, charophyte and foraminifera with the inter-trappeans near Rajahmundry represented estuarine conditions of deposition.

After the cessation of the volcanic activity, there was a lull in the geological history of the Indian Peninsula for a brief period. The lateralization processes (chemical weathering), which commenced during the Tertiary period became vigorous during the Quaternary under the influence of intense monsoonal climate giving rise to laterite capping in the upland region. There are evidences of uplift even during the Quaternary and the processes of physical and chemical weathering and deposition continue to operate and modify the present-day physiography.

b) Local Geology of Project Area

The Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) is located in the Peninsular Plateau Geological Region of India, a table-land, which once formed part of the Gondwana Land. Peninsular Plateau is composed of old crystalline, igneous and metamorphic rocks. The plateau consists of broad and shallow valleys and rounded hills. The Peninsular Plateau is further sub-divided into two sub-regions viz., i) The Central Highlands; and ii) the Deccan Plateau. PRLIS lies in the Deccan Plateau Sub-region.

The Deccan Plateau is a triangular land mass lying south of the Narmada River. The Western Ghats and Eastern Ghats form western and eastern boundaries of the Deccan Plateau. While the Western Ghats lie parallel to the west coast, the Eastern Ghats are parallel to the east coast. The Western Ghats are higher than the Eastern Ghats, giving the region its general slope from west to east. Three major rivers viz., Godavari, Krishna and Kaveri originate in the Western Ghats and merge in the Bay of Bengal, flowing towards east.

The general Geological Succession of the area is presented in **Table 3.1**, while the map depicting geology of the project area is shown in **Figure 3-3.**

Table 3.1: General Geological Succession in the Project area

Rock Group/Formation (Age)	Rock Type	Characteristics
River Alluvium (Pleistocene)	Sand, Silt and Clay	Unconsolidated sediment-
Pleistocene	Laterite	Moderately hard, porous
Deccan Trap (Cretaceous to Palaeocene)	Basalt, Intertrappean	Parallel layered, step topography
Cretaceous	Infratrappean	-
Kurnool group (Neoproterozoic)	Quarzite with Conglaomerate	Diamondiferous and polymictic
Cuddapah Super Group (Mesoproterozoic)	Dolomite, Chert, Mudstone with basic Sills.	Hard and Massive
	Quartzite/Arkose with Conglomerate	Gritty to medium grained
	(Papagni Group)	
Eparchaean Unconformity		
Intrusives	Quartz Reef/Vein	Hard and Massive
	Basic Intrusive (Dolerite)	
	Granite (Equivalent of Closepet Granite)	
Peninsular Gneissic Complex (Archaean)	Granite, Gneisses and Migmatites (with minor xenoliths of Tonalite, Trondhjemite,	Hard and Massive
	Granodiorite, Amphibolite and Biotite Schist)	

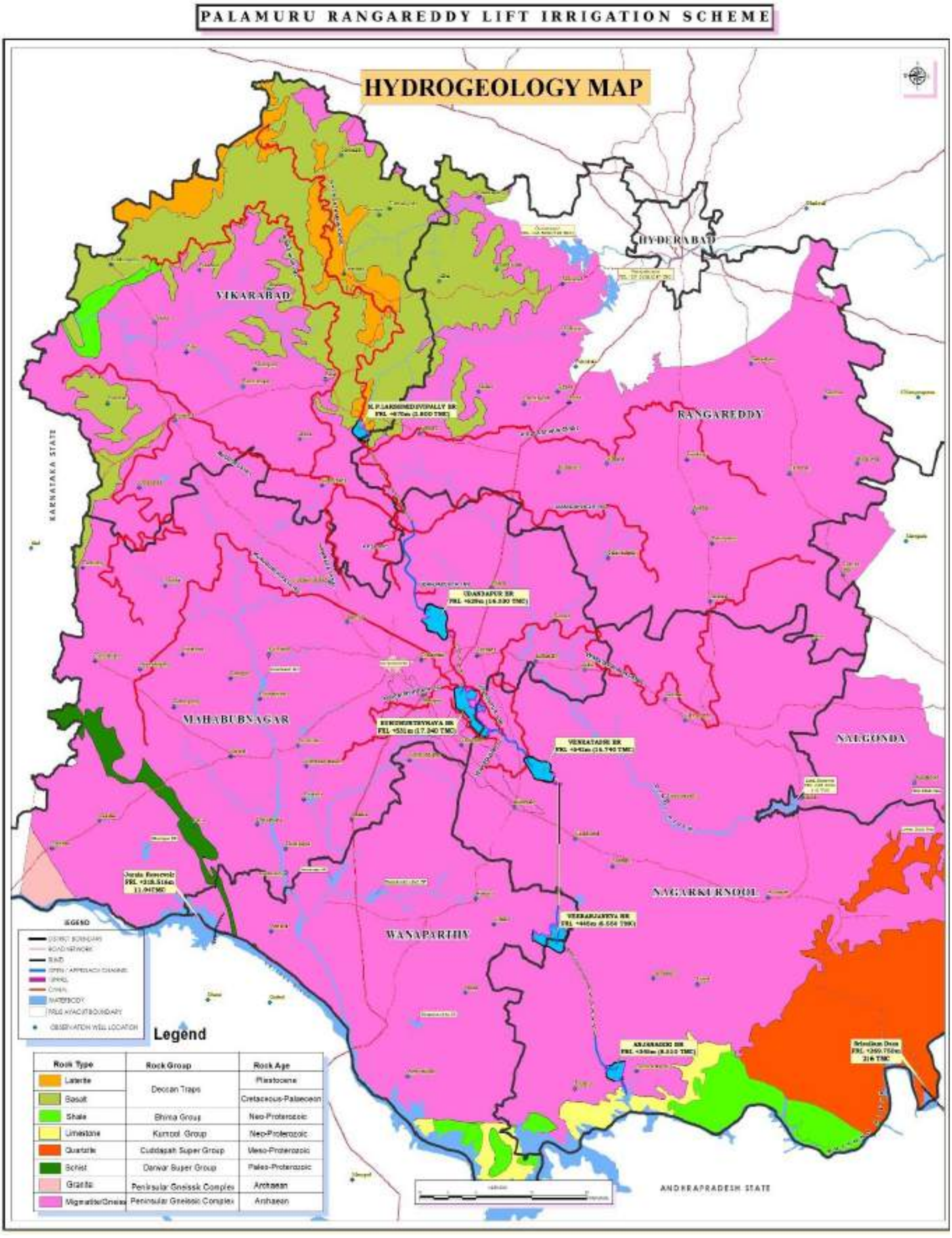


Figure 3.3: Geology Map of PRLIS

Peninsular Gneissic Complex (PGC)

Most of the project area is occupied by Peninsular Gneissic Complex, comprising of three types of rock units - i) two varieties of granitoid rocks viz., the older granodiorite-adamellite and the younger granite - alkali feldspar; and ii) undigested patches of older metamorphic rocks and bands of migmatites that resulted from intermixture of the granitoids and the older metamorphic rocks as seen as xenoliths. Among these three rock units, granite is widely distributed throughout the area. The granite here is grey to pink, medium to coarse grained, porphyritic to non-porphyritic and massive. The granite occupies higher topographic levels forming denudation hills, dome shaped mounds (inselbergs) and boulder outcrops.

Younger Intrusive

The rocks of Peninsular Gneissic complex and Dharwar Super group are profusely injected by apatite and fine grained quartzo-feldspathic veins and pegmatite, quartz veins and reefs. The length of these bodies varies from few meters to a few hundreds of meters with the width varying from 7 m to 50 m trending in NW-SE, N-S and NNE - SSW direction. In addition, all the rocks in the area are cut across by basic intrusive which include dolerite, gabbro and pyroxinite. These dykes are oriented in E-W, NE-SW and N-S direction with a width of 7 m to 50 m and lengths up to several kilometres.

Cuddapah Super Group

A thin section of Upper Proterozoic sedimentary formations belonging to Cuddapah Group (equivalents of Kurnool Group of rocks) unconformably overlie the PGC, in the southern part of the PRLIS area.

Deccan Traps

The Deccan traps occur over the rocks of Peninsular Gneissic Complex or Bhima Group of rocks around Kodangal, Shadnagar, Pargi and Vikarabad. The Deccan Trap rocks comprise of horizontally disposed different lava flows of basaltic composition, inter-trappean and infra-trappean beds and red bole. Each lava flow is characterized by hard and massive (fine to medium grained) bottom and vesicular tops normally filled with secondary minerals like chalcedony, quartz, calcite and zeolites. The thickness of each flow varies from 15 to 20 m. The Inter-trappean beds consist of conglomerates, chert and sandstone which are fossiliferous and vary in thickness from 0.5 m to 8 m. Infra-trappean beds (Upper Cretaceous) also comprise of conglomerate, grit, sandstone, marl and chert. The thickness of infra-trappeans varies from 0.5 m to 8 m and these are also fossiliferous.

Laterite

Laterite is derived from in-situ physico-chemical weathering of basaltic flows. It is characterized by cavernous structures and occupies topographically higher elevations in the Northern part of the project area as cap rock. A series of WNW – ESE trending faults are seen in the South Eastern part of the area.

3.4.3 Seismicity, Tectonics and Past Earthquakes In This Area

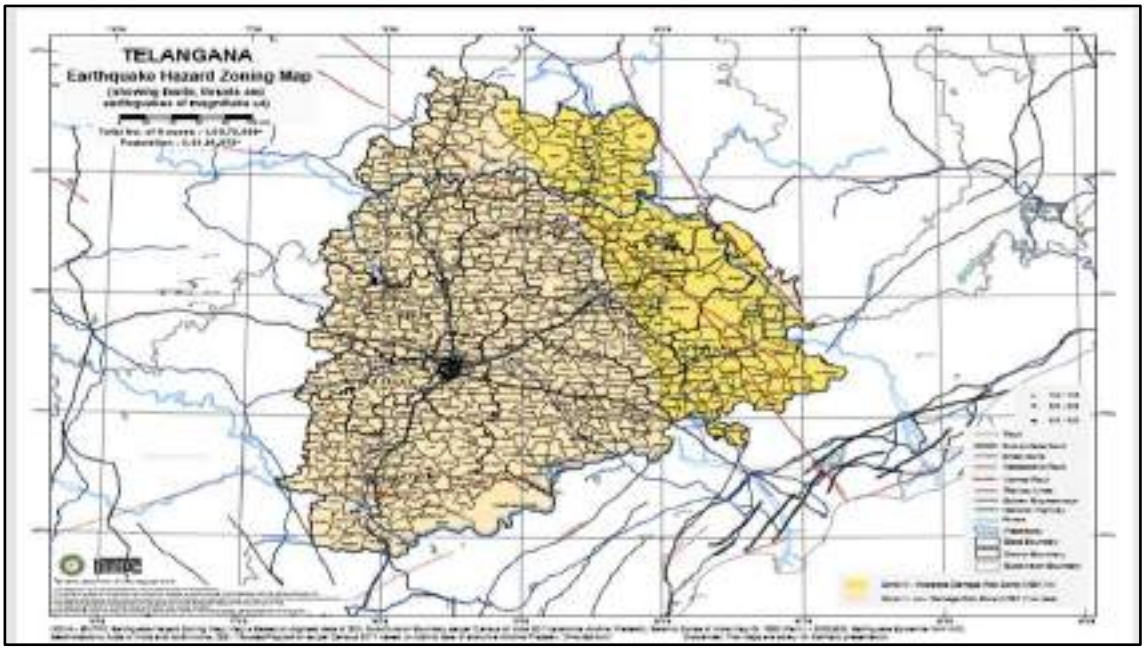
The geographical area of Telangana State lies in Zone II and III as per the seismic zoning map of India prepared by Bureau of Indian Standards (BIS code: IS 1893: Part-1:2002). The seismic zoning map of India and Telangana Earthquake Hazard Zoning Map is shown in **Figure 3.4.**

The project site, which is covered under erstwhile Mahabubnagar, Rangareddy and Nalgonda districts, is distinctly located in Zone II which is a Low Damage Risk Zone (MSKVI or less)

Largest earthquake in Telangana area occurred on 13 April 1969 – KichanapalleGollagudem area with a movement magnitude of 5.7. This event is often referred to as the Bhadrachalam earthquake of 1969. It is among the strongest earthquakes in the southern peninsula. The shock caused considerable damage in and around Bhadrachalam. The maximum observed intensity was VII.For the design of earthquake resistance dam/hydraulic structures, applicable relevant standards and guidelines as per IS: 1893:2002 have been considered.

NW-SE and NNE-SSW trending lineaments and faults are common in the area. A series of WNW-ESE trending faults are seen in the South-eastern part of the area.

Figure 3.4: Seismic Zones of India



3.4.4 Land Use and Land Cover of Study Area

Mapping of land use/land cover (LULC) on 1:50,000 scale has been generated, using multi-temporal IRS-P6 AWiFS data. Multi-temporal AWiFS data covering Kharif (Aug –Nov), Rabi (Jan-Mar), Zaid (April- May) seasons were used to address spatial and temporal variability in cropping pattern and other land cover classes. The multi-temporal datasets were geo-referenced and later all the satellite datasets were converted into TOA reflectance data to minimize temporal variability. The image processing software ERDAS Imagine was used. The AWiFS quadrants were imported. The reference scene path/row scheme identified in which the AWiFS quadrant.

The dominating classes are, agricultural land Kharif cropped area accounted for maximum 3,39,562 ha (38.41% of the gross command area) followed by agricultural land double cropped area and agricultural fallow lands and agriculture land Rabi/summer cropped with 2,16,735 ha (24.52%) 1,47,959 ha (16.74%) and 33,728 ha (3.82%) respectively. The agricultural land including current fallows accounted for about 84.01 per cent of total gross command area with 7,43,250 ha of land in this category. on the other hand, the non-agricultural land accounted for less than 16 percent of the total gross command area. The land use pattern of command area is enumerated in **Table 3.2** and its disposition in **Figure 3.5.**

Table 3.2: Land Use of Gross Command Area

S. No.	Land use category	Area (ha)	Area (%)
1	Agricultural Land-Crop Land-Cropped in 2 seasons	2,16,735	24.52
2	Agricultural Land- Kharif Crop	3,39,562	38.41
3	Agricultural Land- Rabi/ summer Crop	33,728	3.82
4	Agricultural Land-Fallow	1,47,959	16.74
5	Agricultural Land-Plantation	5,266	0.60
6	Built Up Land	21,193	2.40
7	Forest-Deciduous	14,758	1.67

S. No.	Land use category	Area (ha)	Area (%)
8	Forest-Scrub	21,083	2.39
9	Tree clad Areas- dense/closed	5,511	0.62
10	Salt affected waste land	4,209	0.48
11	Waste Lands	43,671	4.94
12	Water bodies-Reservoir/Tanks	30,270	3.41
		8,83,945	**100.00**

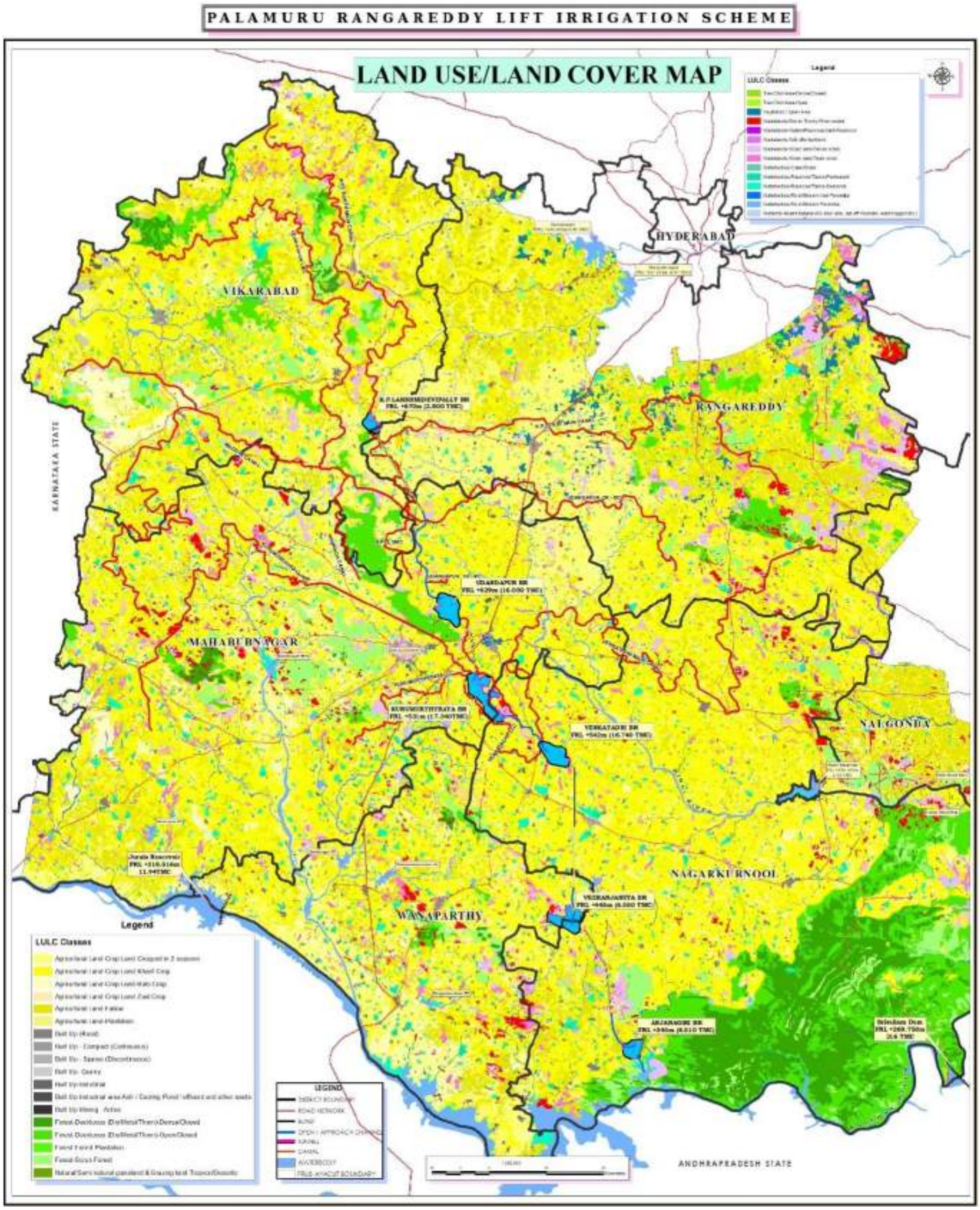


Figure 3.5: Land Use map

3.4.5 Slope of Study Area

The predominant slope categories viz. 0-1% and 1-3% i.e., nearly level accounted for over 93.14 % of the gross command area of the project with about 8,83,845 ha of gross command area. The soil slope may not be a constraint in planning cropping pattern since more than 97.49 per cent of gross command area is within moderately soil sloping categories. The slope area under different slope classes is tabulated in **Table 3.3.**

Table 3.3: Slope Classes in Command Area

S. No	Slope Range	GCA (ha)	Area (%)
1	0 – 1	785,792	88.90
2	1 – 3	37,449	4.24
3	3 – 5	10,314	1.17
4	5 - 10	11,602	1.31
5	10 - 15	5,169	0.58
6	15 - 35	3,347	0.38
7	>35	0	0.00
8	Water Bodies	30,272	3.42
Total		**8,83,945**	**100.00**

3.4.6 Presence of Important Economic Mineral Deposit

Valuable mineral deposits that are reported to occur in PRLIS area are: Quartz, Feldspar, Fuller's Earth, Kaolin, Ochre, Copper, Steatite and Limestone. Quartz and Feldspar suitable for glass and ceramic industry occurs at many places in the project area. Quartz occurs as veins at Kukutpalli, Bahadurpalli, Lingampalli, Shamshabad, Guruguntla, Tirumalapuram, Chowlapalli, Panchakalpadu and Vithal of Shadnagar Mandal. Red and yellow ochre occur as pockets below hard laterite in the plateau scarps of Vikarabad.Kaolinitic clay occurrences are reported from a few places of Shadnagar and Gadwal taluks. Steatite occurs as lenses and bands at a few places in the tract between Somasila and Kollapur of Kollapur taluk and also in Makhtal taluk.

No injurious material likely to create health hazard is observed in the submergence areas of the balance reservoirs.

3.4.7 Land Slide Zonation

No dynamic land slide/slips have been observed within the reservoir area, near alignment of main canals. As the project area forms part of the stable peninsular shield, there is no reported occurrence of rock fall or landslides.

3.4.8 Land Archaeological/Religious/Historical Monuments

No archaeological monument of national importance lies either in the project area. There is also no structure of national heritage in the area. No religious or historical monument of local importance shall fall along the canal alignment.

3.4.9 Sensitive Areas

The nearest distance of the Phase-I project component is 11.95km from Amarabad WLS and 2.56km from buffer area of Amarabad Tiger reserve (Rc.No.6531/2016/FCA-1/TS, dt; 20.12.2016). However, no National Park, WLS, Défense Establishments, Archaeological Monuments, Notified Eco-sensitive areas or protected area under Wild Life (Protection) Act exists within 10 km distance from the command area under Phase-II.

3.5 METEOROLOGY, AIR AND NOISE

Meteorological factors have a direct bearing on the dispersion and dilution of pollutants/contaminants, discharged into the atmosphere with consequent impact on air Environment. Micro-meteorological properties of the atmosphere govern the concentration of pollutants and its variations with time and location with respect to their sources. Meteorological information is required to understand the climatic profile of the area as well as for devising the baseline ambient air quality monitoring plans. The nearest authoritative IMD meteorological stations are located in Nalgonda, Mahbubnagar and Hyderabad. The climatologically summary for all the three stations is given in **Table 3.4, Table 3.5 and Table3.6** and the interpretation of the data is given in sub section.

Table 3.4: Climatological Summary for IMD Station in Nalgonda (1981-2010)

Month	Mean max. temp(^{0}C)	Mean min. temp (^{0}C)	Monthly Rainfall(mm)	R.H.at 8:30 (%)	R.H.at 17:30(%)	Mean wind speed(km/h)
January	33.8	15.2	5.5	82	47	1.8
February	36.7	17.3	5.3	81	47	2.6
March	40.6	19.6	8.9	79	42	3.1
April	42.8	22.2	17.1	73	39	3.5
May	44.9	23.4	33.2	61	36	3.8
June	42.7	23.3	75.5	70	50	4.3
July	37.7	22.9	139.6	76	61	3.4
August	35.7	22.7	138.5	77	65	2.9
September	36.3	22.6	148.3	77	67	1.8
October	35.8	20.8	127.2	79	64	1.4
November	33.6	17	45.5	75	59	1.5
December	32.2	14.7	6	76	53	1.6
Average Total	**44.9**	**15.4**	**750.7**	**75**	**51**	**2.6**

Table 3.5: Climatological Summary for IMD Station in Mahbubnagar (1981-2010)

Month	Mean max. temp(^{0}C)	Mean min. temp (^{0} C)	Monthly Rainfall(mm)	R.H.at 8:30 (%)	R.H.at 17:30 (%)	Mean wind speed (Km/h)
January	33.7	14.1	4.5	63	42	3.9
February	36.5	16.4	4.4	56	36	3.8
March	39.9	19.1	6.5	52	33	3.5
April	42	21.4	20.9	51	32	4.1

Month	Mean max. temp(^{0}C)	Mean min. temp (^{0} C)	Monthly Rainfall(mm)	R.H.at 8:30 (%)	R.H.at 17:30 (%)	Mean wind speed (Km/h)
May	43.1	22.6	38.1	56	36	5.5
June	40.4	21.9	109.9	73	55	7.5
July	35.4	21.4	154.6	80	66	6.1
August	34.1	21.4	171.2	83	71	5.9
September	34.8	21.1	155.8	81	69	3.8
October	34.2	17.9	88.2	74	63	3.5
November	33.2	15.2	12.9	65	52	4.5
December	32.4	13.9	3.7	64	45	4.8
Average Total	**42.9**	**13.2**	**770.8**	**66**	**50**	**4.7**

Table 3.6: Climatological Summary for IMD Station in Hyderabad (1981-2010)

Month	Mean max. temp(^{0}C)	Mean min. temp (^{0} C)	Monthly Rainfall(mm)	R.H.at 8:30 (%)	R.H.at 17:30(%)	Mean wind speed (Km/h)
January	32.7	12	9.3	72	40	6
February	35.7	14.5	9.2	63	32	6.6
March	38.9	17.9	17.8	55	28	6.8
April	41.2	20.3	21.7	52	28	7.3
May	42.4	21.9	31.7	49	30	10.4
June	40.3	20.9	111.2	70	51	14.8
July	35	20.6	179.2	79	64	14.9
August	33.2	20.6	207	82	69	13.8
September	33.8	20.3	132.9	79	65	9.5
October	33.6	16.5	103.6	82	56	6.9
November	32	13.1	26.1	79	48	6.4
December	30.9	11.4	4.9	73	43	5.6
Average Total	**42.7**	**10.6**	**854.6**	**68**	**46**	**9.1**

3.5.1 Temperature and Rainfall

The mean maximum temperature for Nalgonda is 44.9° C while mean minimum temperature of 15.4° C. The mean maximum temperature for Mahbubnagar is 42.9° C while mean minimum temperature of 13.2°C. The mean maximum temperature for Hyderabad is 42.7° C while mean minimum temperature of 10.6°C. The 30-year average temperature and precipitation levels for Nalgonda, Mahbubnagar and Hyderabad districts are presented in **Figure 3.6, 3.7 & 3.8.**

Month of June, July, August and September mainly contributes the rainfall. In Nalgonda, the total annual rainfall was recorded ad 750.7 mm (1981-2010), maximum monthly rainfall was recorded as 148.4 mm which occurred in September, and minimum monthly rainfall was 5.3 mm which has been recorded in February. In Mahbubnagar, the total annual rainfall was recorded as 770.8 mm, maximum monthly rainfall was recorded as 306.6 mm which occurred in August, and minimum monthly rainfall is 3.7 mm which occurs in December. In Hyderabad, the total annual rainfall was recorded as 770.8 mm, maximum monthly rainfall was recorded as 306.6 mm which

occurred in August, and minimum monthly rainfall is 3.7 mm which occurs in December. There are about 37 rainy days in a year for Nalgonda, 50 rainy days for Mahbubnagar district and about 40 rainy days are recorded in Hyderabad.

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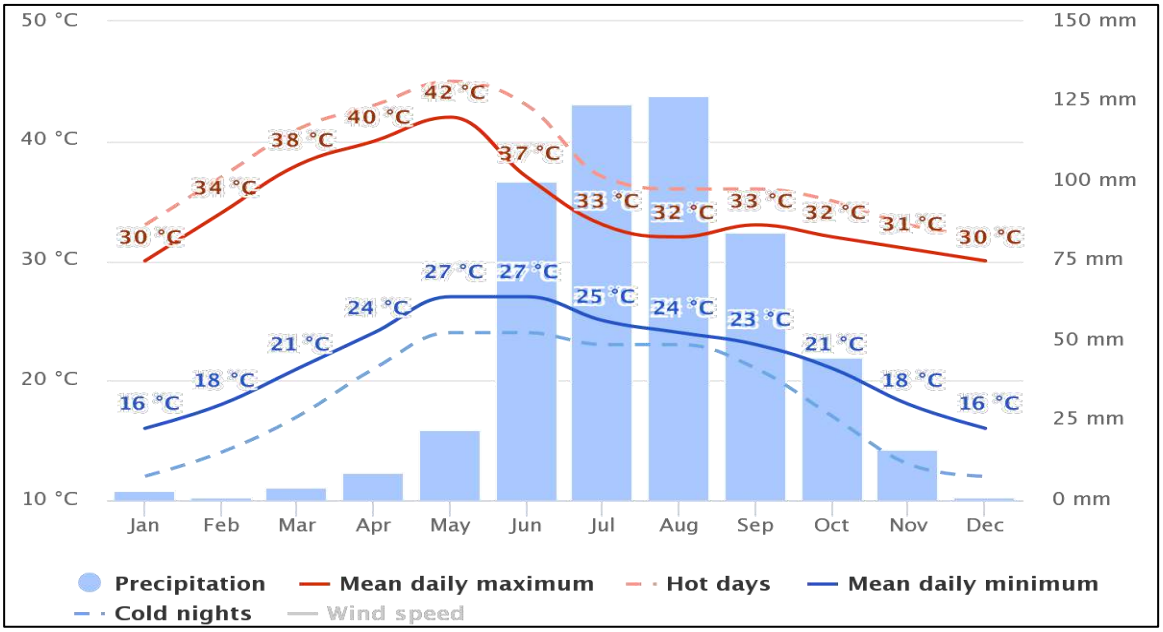


Figure 3.6: Average Temperature and Precipitation (Nalgonda)

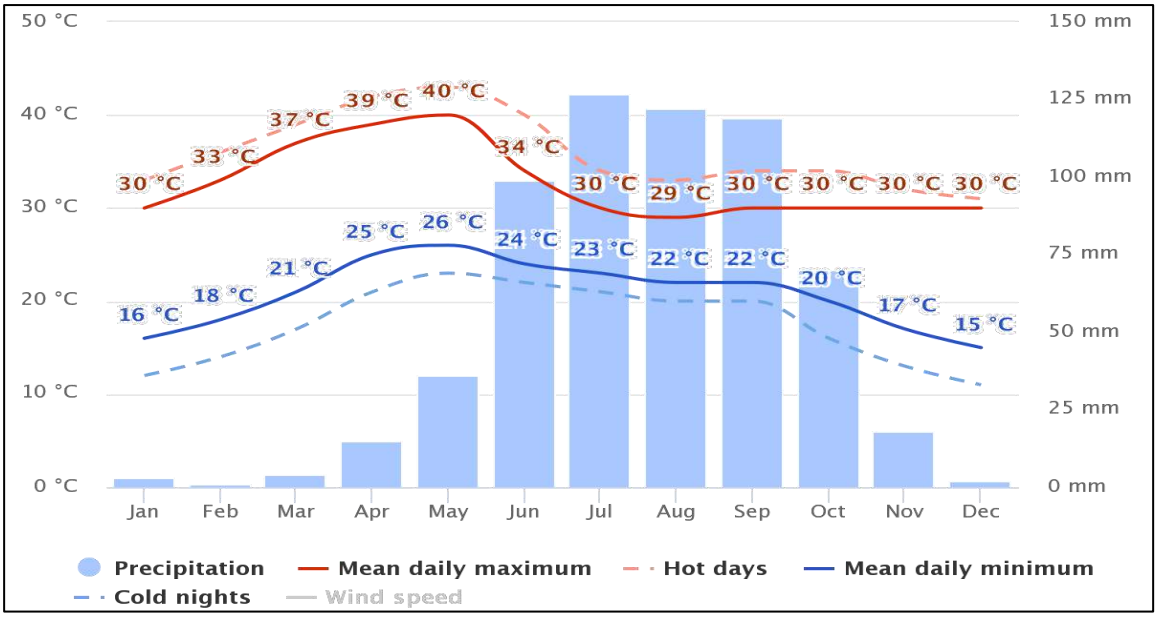


Figure 3.7: Average Temperature and Precipitation (Mahbubnagar)

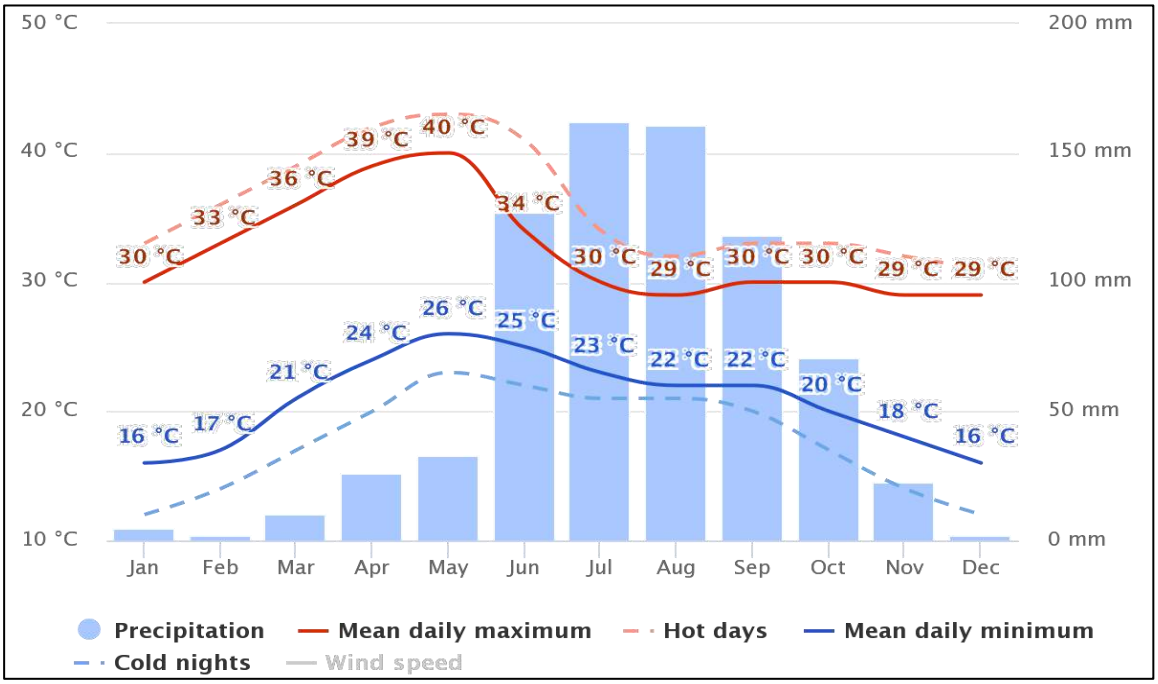


Figure 3.8: Average Temperature and Precipitation (Hyderabad)

3.5.2 Relative Humidity

In case of Nalgonda, during the monsoon season, relative humidity generally varies between 70% to 77% in the morning and 50% to 57% in the afternoon. The air becomes dry after the withdrawal of the southwest monsoon. The driest part of the year is the summer season when in the afternoon's relative humidity becomes as low as 36% which has been found in the month of May. In Mahbubnagar, the relative humidity found in a range of 73% and 83% in monsoon and becomes lowest in the month of April *i.e.,* 32%. In Hyderabad, during the monsoon season,

relative humidity generally varies between 70% to 82% in the morning and 51% to 69% in the afternoon. The air has lost its humidity in the summer season when in the afternoon's relative humidity becomes as low as 30% which has been found in the month of May.

3.5.3 Wind Pattern

Predominant wind direction is west and south-west. Winds are moderate to high particularly during the morning hours while during the afternoon hours the winds are stronger. During the monsoon winds blow from W and SW direction. Yearly mean wind speed is 12.5 km/hr. During monsoon season average wind speed is 23.3 km/hr. The wind-rose diagram for Nalgonda, Mahbubnagar and Hyderabad shows how many hours per year the wind blows from the indicated direction, **Figure 3.9, 3.10 and 3.11.**

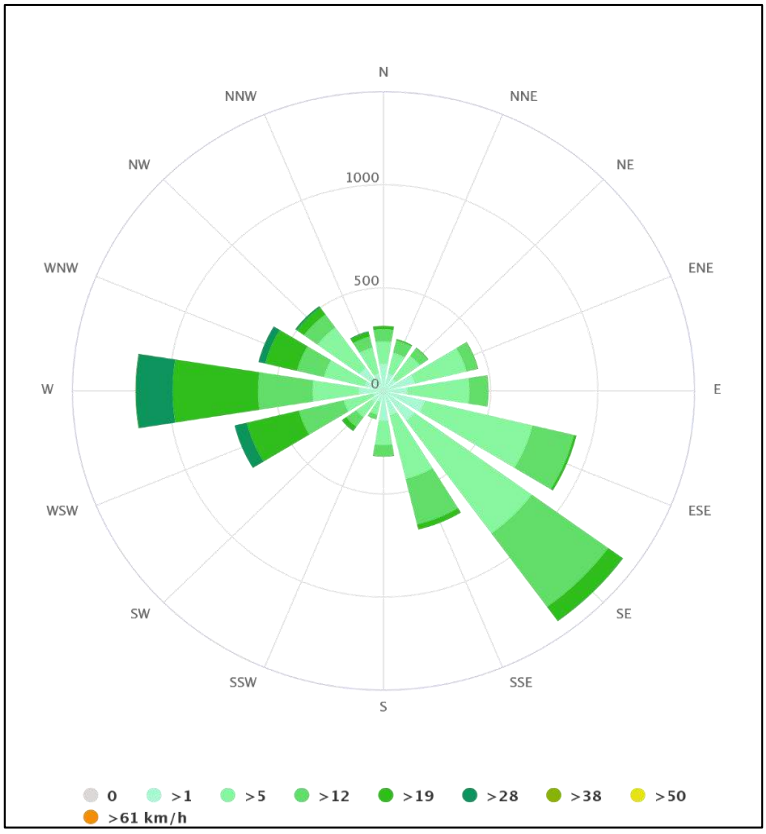


Figure 3.9: Windrose (Nalgonda)

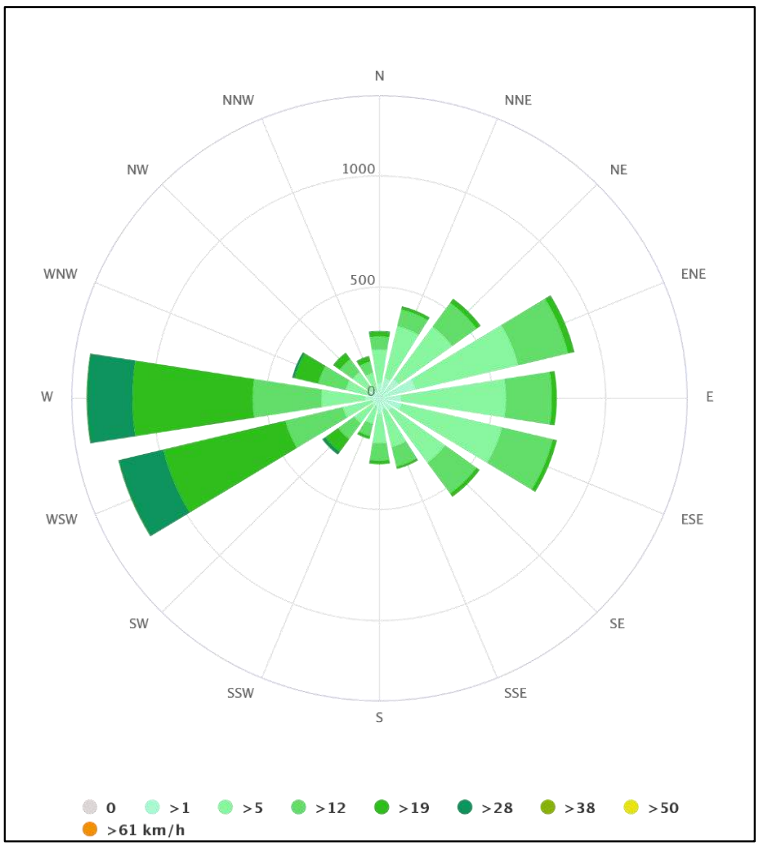


Figure 3.10: Windrose (Mahbubnagar)

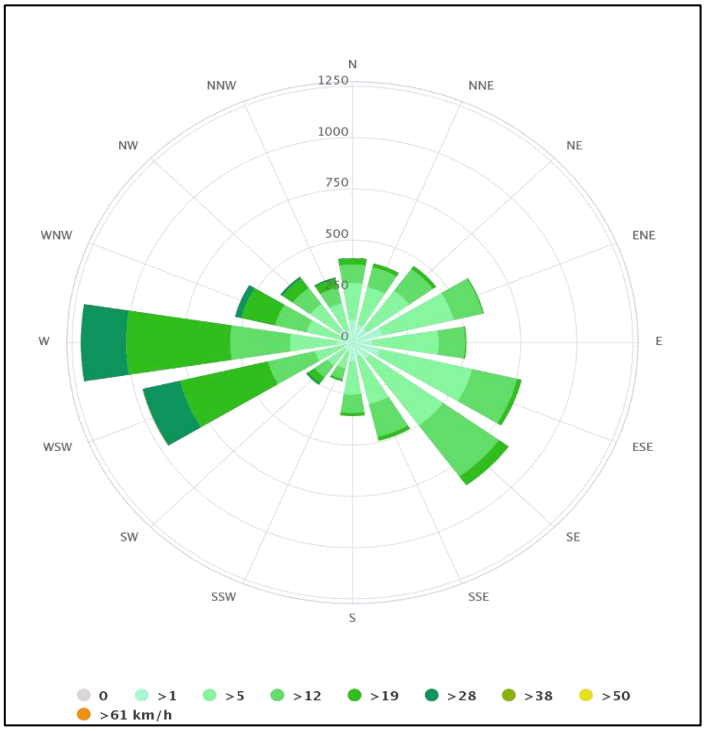


Figure 3.11: Windrose (Hyderabad)

3.5.4 Cloud Cover

In Nalgonda, 30 years' average data reveal that maximum cloud cover is observed around 5.2 octas in the month of July. Generally, cloud cover is observed around 1.5 (in octas) in the month of March. In Mahbubnagar district, the maximum cloud cover is observed 6.7 (in octas) in the month of August and lowest cloud cover is observed 0.5 (in octas) in the month of March. For Hyderabad, the highest cloud cover is found as 6.6 (in octas) and lowest cloud cover is found in the month of March, *i.e.,* 0.7 (in octas). The monthly number of sunny, partly cloudy, overcast along with precipitation days is presented in **Figure 3.12, 3.13** and **3.14.**

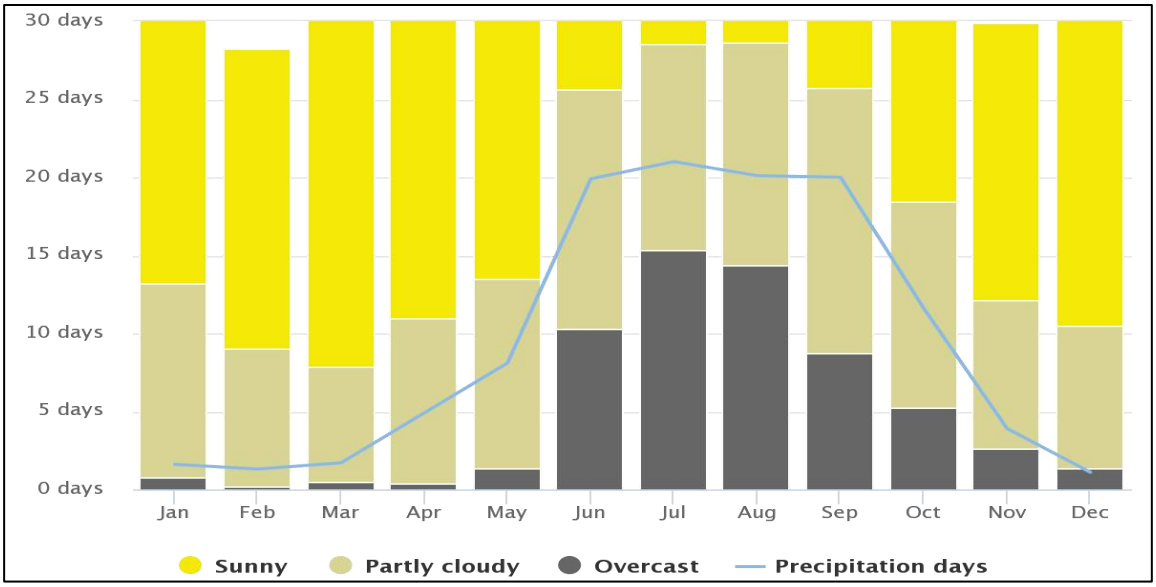


Figure 3.12: Cloudy, Sunny, and Precipitation Days (Nalgonda)

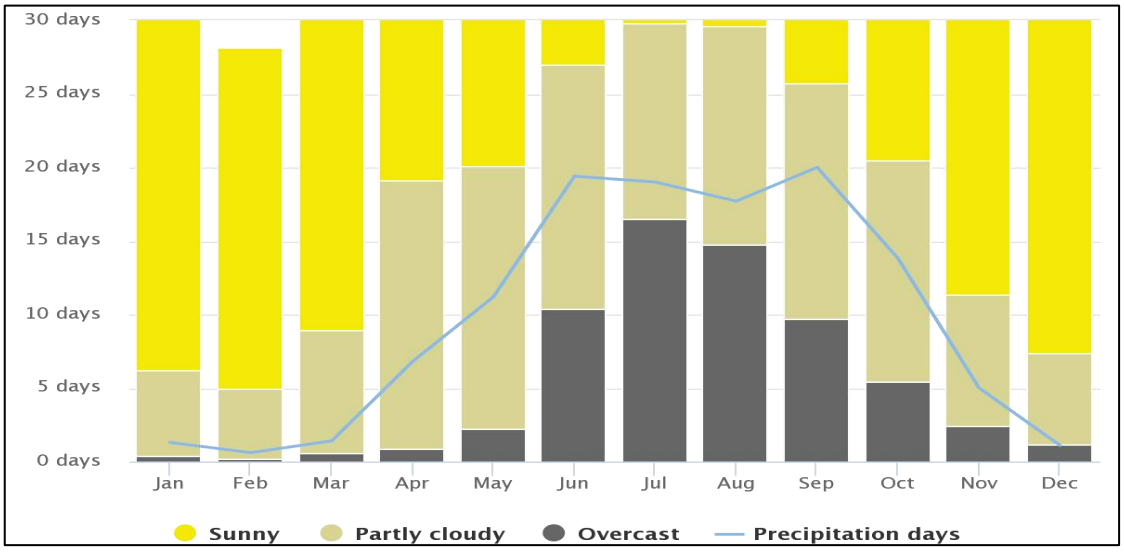


Figure 3.13: Cloudy, Sunny, and Precipitation Days (Mahbubnagar)

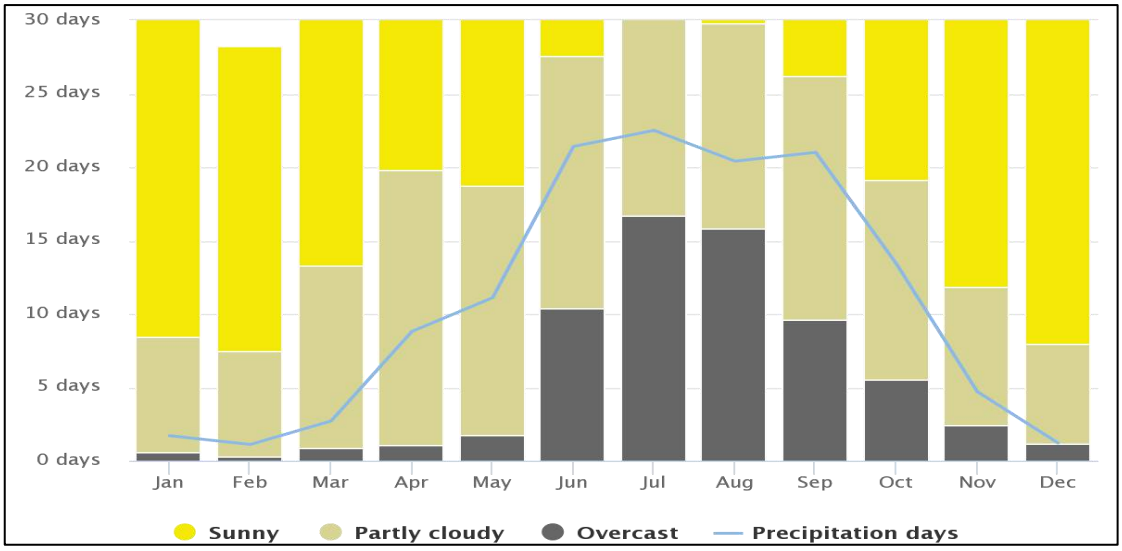


Figure 3.14: Cloudy, Sunny, and Precipitation Days (Hyderabad)

3.5.5 Air Environment

Air pollution can cause significant effects on the environment and subsequently on human, animals, vegetation and materials. In most cases, air pollution worsens pre-existing diseases or degrades health status, making people easily susceptible to other infections and development of chronic respiratory and cardiovascular diseases. Further, environmental impacts from air pollution can include acidic deposition and reduction in visibility. The proposed project is irrigation project where no air pollution is envisaged during operation phase. During construction phase, minor air pollution may occur due to quarrying, blasting, drilling, vehicle and D.G set operation. The bassline monitoring reports for air, noise, soil, ground water and surface water sampling locations are enclosed as **Annexure VII**

As mentioned earlier, environmental monitoring was carried out in accordance with the Terms of Reference (ToR) (vide letter dt. 11th October, 2017; No. J-12011/31/31/2017-IA-I (R)) issued by the Ministry of Environment and Climate Change (MoEF&CC) covering three seasons – Monsoon-2019; post-Monsoon, 2019 and Pre-Monsoon, 2020. Selection of sampling stations followed the criteria laid down by Central Pollution Control Board as well as those adopted by the MoEF&CC, whereas, the number of locations were based on approved ToR issued by MoEF&CC. As such, six sampling location (refer pg.8 of the ToR, section no 6(A), sub-section - ii, iii and v) were selected for the purpose of this study. The details of sampling locations are presented in **Table 3.7** and **Figure 3-15**. Monitoring was carried out for Particulate Matter (PM_{10}& $PM_{2.5}$), Sulphur dioxide (SO_2), and Oxides of Nitrogen (NO_x) as per TOR. Sampling was carried out on 24-hourly, twice a week.

Table 3.7: Air Monitoring Locations

S. N.	Location Code	Location	Co-ordinates
1	AAQ-1	Boin Palli Village	16°44'28.05"N, 78°20'46.55"E
2	AAQ-2	Munimokesham Village	16°50'46.30"N, 77°51'5.10"E
3	AAQ-3	Madhanapuram Village	16°55'38.81"N, 78°44'13.16"E
4	AAQ-4	Bandanadi Gudur Village	17° 5'53.30"N, 78°30'18.60"E

S. N.	Location Code	Location	Co-ordinates
5	AAQ-5	Medipalle Kalan Village	17°13'53.28"N , 78° 0'41.00"E
6	AAQ-6	Yenkepalle Village	17° 9'6.10"N, 77°38'0.80"E

The ambient air quality levels were assessed with respect to National ambient air quality standards prescribed by Central Pollution Control board (CPCB) 2009 Summary results of ambient air quality monitoring data are shown in **Table 3.8**, **Table 3.9** and **Table 3.10.**

Table 3.8: Summary of Ambient Air Quality Data (µg/m^3) During Monsoon, 2019

St. Code	PM_{10}			$PM_{2.5}$			SO_2			NO_2		
	Min	Max	98%	Min	Max	98%	Min	Max	98%	Min	Max	98%
AAQ-1	26.6	33.3	33.3	14.9	18.6	18.6	4.0	4.6	4.6	10.5	11.6	11.6
AAQ-2	20.2	24.0	23.9	10.8	13.0	12.9	4.1	4.6	4.6	8.8	10.5	10.4
AAQ-3	18.3	20.3	20.3	9.9	11.3	10.9	4.0	4.3	4.3	7.9	9.4	9.3
AAQ-4	18.9	22.3	22.2	10.3	11.9	11.9	<4.0	4.2	4.2	8.1	9.2	9.2
AAQ-5	18.9	22.4	22.4	9.9	13.6	13.4	4.1	4.3	4.3	7.9	9.3	9.3
AAQ-6	21.5	24.5	24.5	10.8	13.5	13.4	<4.0	5.4	5.3	9.5	13.0	12.9
24 hr NAAQS	**100**			**60**			**80**			**80**		

Table 3.9: Summary of Ambient Air Quality Data (µg/m^3) During Post - Monsoon, 2019

St. Code	PM_{10}			$PM_{2.5}$			SO_2			NO_2		
	Min	Max	98%	Min	Max	98%	Min	Max	98%	Min	Max	98%
AAQ-1	38.9	45.6	45.6	21.1	26.9	26.5	6.1	7.4	7.3	14.4	18.3	18.0
AAQ-2	31.6	35.6	35.5	15.5	21.2	20.8	4.2	5.7	5.7	10.3	15.0	14.7
AAQ-3	28.4	32.6	32.5	15.9	18.4	18.3	5.2	6.1	6.1	10.5	12.3	12.2
AAQ-4	21.6	28.6	28.3	11.0	14.9	14.9	<4.0	5.2	5.1	7.5	10.1	10.0
AAQ-5	23.9	28.1	28.1	12.4	16.2	16.0	4.2	5.7	5.6	8.4	10.5	10.4
AAQ-6	28.6	34.6	34.3	14.0	19.2	19.0	<4.0	5.5	5.4	9.5	13.2	13.1
24 hr NAAQS	**100**			**60**			**80**			**80**		

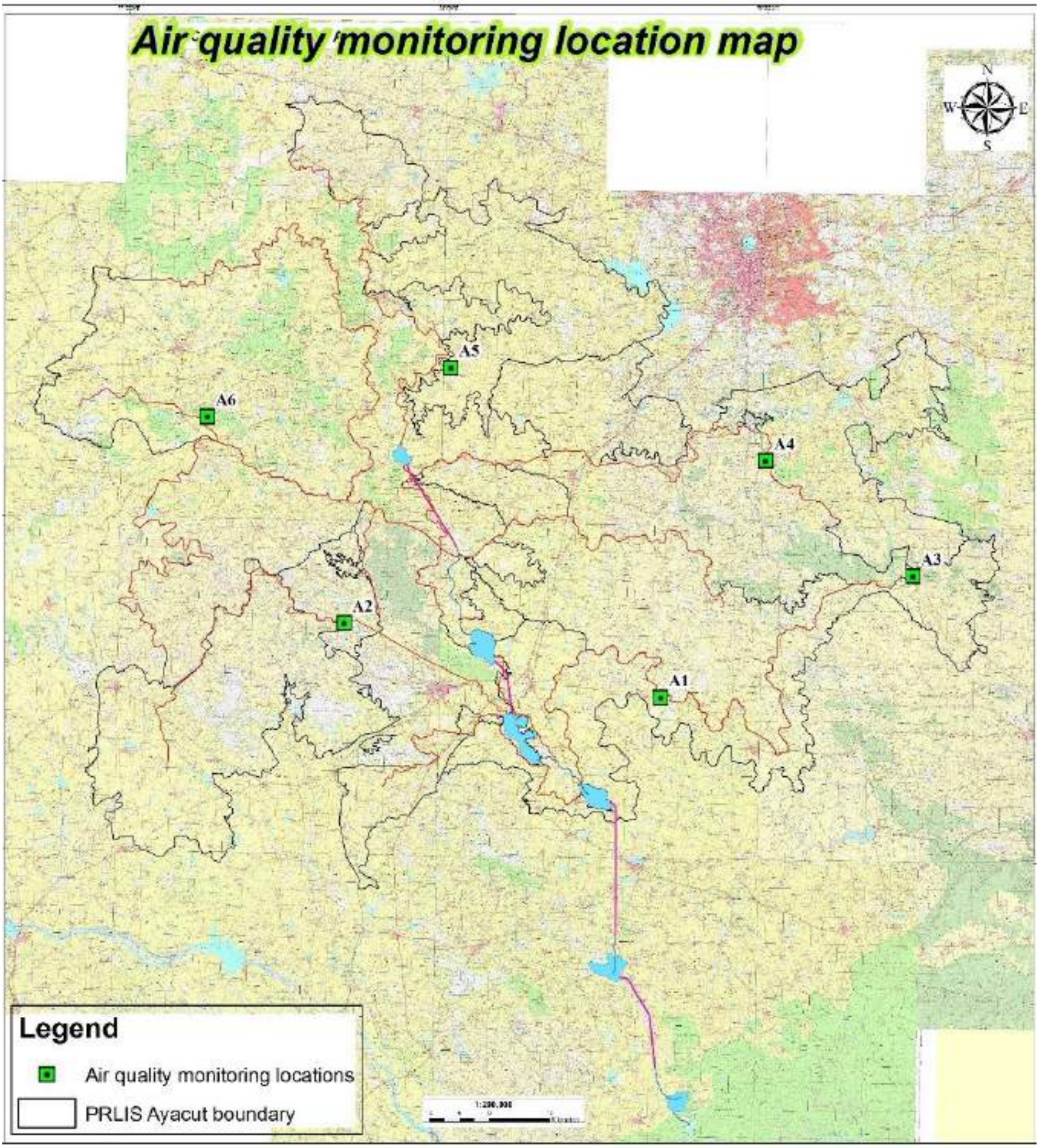


Figure 3.15: Ambient Air Sampling Locations

Table 3.10: Summary of Ambient Air Quality Data (µg/m³) During Pre-Monsoon, 2020

St. Code	PM_{10}			$PM_{2.5}$			SO_2			NO_2		
	Min	Max	98%	Min	Max	98%	Min	Max	98%	Min	Max	98%
AAQ-1	41.3	49.3	48.9	21.3	25.8	25.7	6.0	6.8	6.8	14.2	17.5	17.5
AAQ-2	31.3	39.0	38.9	15.9	21.6	21.4	4.7	5.7	5.7	10.8	14.6	14.6
AAQ-3	29.9	34.5	34.5	15.4	19.4	19.3	5.1	6.3	6.3	10.5	13.1	13.1
AAQ-4	24.8	35.0	35.0	12.9	19.5	19.5	4.5	6.1	6.1	8.8	13.6	13.6
AAQ-5	27.4	34.2	34.1	14.0	20.4	20.4	4.9	6.4	6.4	9.5	13.7	13.7
AAQ-6	29.9	34.1	34.1	15.8	19.4	19.3	4.3	5.3	5.3	10.7	14.1	14.1
24 hr NAAQS	**100**			**60**			**80**			**80**		

The monitoring results reflected that at all sampling location the minimum and maximum PM_{10} concentration ranged between 18.3 - 49.3 µg/m³ with 98 percentile values as 48.9 µg/m³, while $PM_{2.5}$ concentration ranged between 9.9 - 26.9 µg/m³ with 98 percentile values as 26.5 µg/m³. Whereas, SO_2 & NO_2 concentrations ranged between 4.0 - 7.4 µg/m³ with 98 percentile values as 7.3µg/m³and 7.5 - 18.3 µg/m³ with 98 percentile values as 18.0 µg/m³ respectively. Overall, it's observed that the concentration of all the pollutants were within the NAAQs limits set forth by CPCB and as per CPCB Criteria for air quality index, air quality in all season at all locations is good as the maximum air quality index has been 49.3, which is below 50.

3.5.6 Noise Environment

Noise can be defined as any sound that is undesirable because it interferes with speech and hearing and is intense enough to damage hearing or is otherwise annoying. Noise impacts can be of concern during construction and operational phases of the project. Factors those are important in determining noise levels include distance from the noise source, natural or manmade barriers between the source and the receptors, whether conditions, etc. In assessing noise, an empirical measure called "dB(A)" indicates damage to hearing. The higher the dB (A) number, the greater is the risk of damage to hearing. Loud noise may adversely affect people in many ways. For example, noise may interface with sleep, speech, communication and can cause infuriation and other physiological problems. Occupational noise exposure is also the most common cause of Noise-Induced Hearing Loss (NIHL), threatening the hearing of individuals exposed to noise pollution for longer periods of time, at a less intense level. For example, repeated exposure to noise pollution at a construction site can cause NIHL to construction workers, an effect that cannot be reversed.

An assessment of baseline noise quality was undertaken to (a) establish the status of exposure of the major sensitive receptors, and (b) to identify the noise pollution levels in and around the site. The noise monitoring was done following CPCB protocol of Noise Monitoring. Noise monitoring was conducted at six locations within the study area wherever possible including the project site, approach roads and sensitive locations. The background monitoring program was carried out in accordance with the requirements of EIA study. Sound pressure level (SPL) measurements were automatically recorded to give the noise level for every hour continuously for 24 hours in a day. Accordingly, one full day (i.e., 24-hourly values) of data was collected at each of the locations for

each season. The monitoring locations are provided in **Table 3.11** and **Figure 3.16**. While the Noise monitoring results have been detailed in 3.16

Leq day time (6 am to 10 pm) and Leq night time (10 pm to 6 am) were calculated using the following equation:

$$L_{eq,T} = 10\log\left(1/n\sum_{i=1}^{n}10^{\frac{L_i}{10}}\right)$$

Where, Li = levels observed at n equally spaced times during interval T. Leq day and night (Ldn) was also worked out by using the following equation:

Ldn =10 Log_{10} [0.666X10 $^{Ld/10}$+0.333 X10 $^{(Ln+10)/10}$

Table 3.11: Noise Monitoring Locations

S. N.	Location Code	Location	Environmental Sensitivity	Co-ordinates
1	N1	Boin Palli	Residential	16°44'22.89"N, 78°20'51.91"E
2	N2	Munimokesham	Residential	16°50'46.10"N, 77°51'5.70"E
3	N3	Madhanapuram	Residential	16°55'39.15"N, 78°44'11.58"E
4	N4	Bandanadi Gudur	Residential	17° 5'51.93"N, 78°30'22.08"E
5	N5	Medipalle Kalan	Residential	17°13'53.17"N, 78° 0'41.10"E
6	N6	Yenkepalle	Residential	17° 9'9.30"N, 77°38'2.65"E

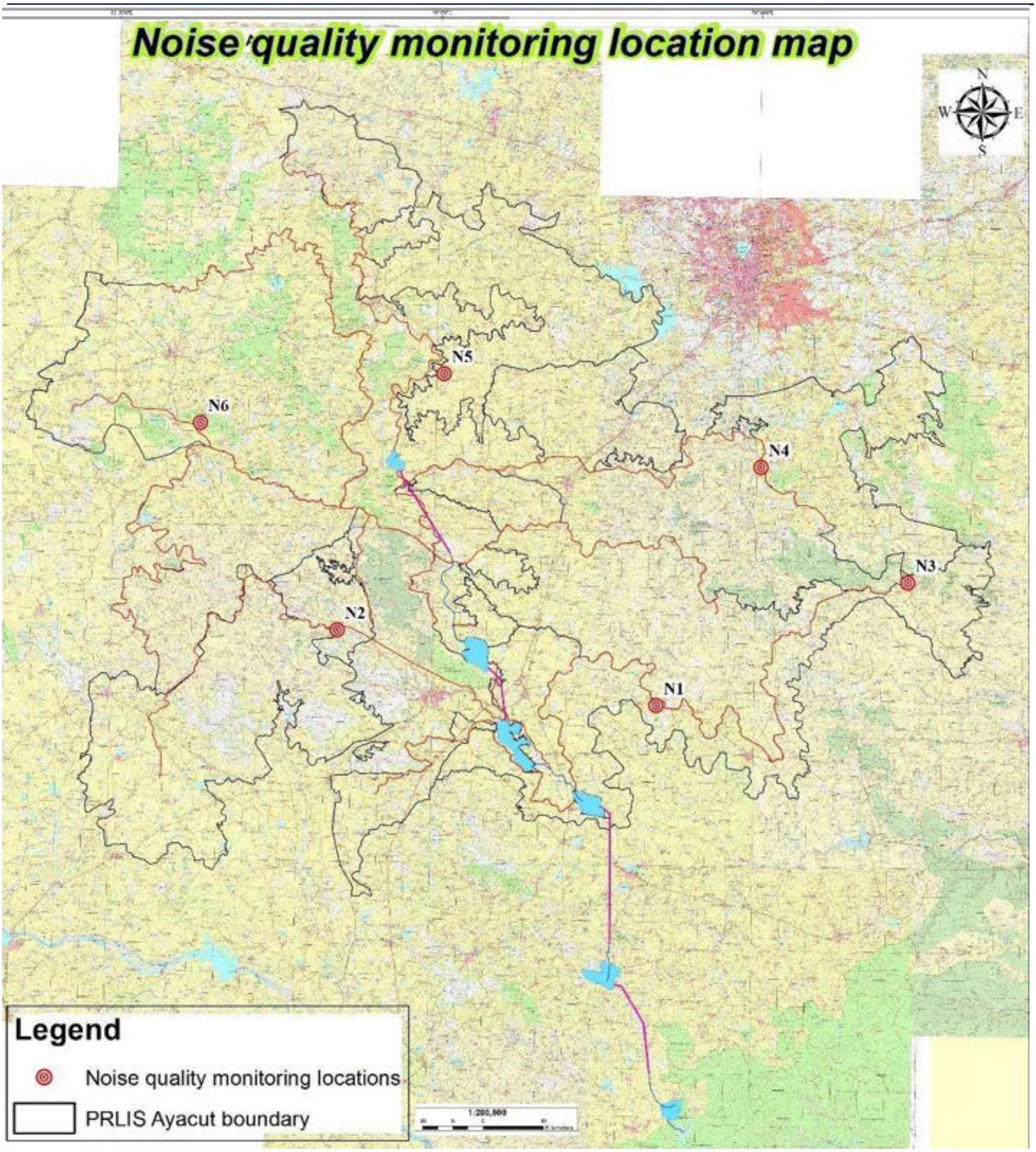


Figure 3.16: Noise Sampling Locations

Table 3.12: Leq D and Leq N and Leq DN noise levels in dB(A)

St. Code	Monsoon (2019)			Post- Monsoon (2019)			Pre-Monsoon (2020)			CPCB Limits Leq. dB(A)	
	Leq D	Leq N	Leq DN	Leq D	Leq N	Leq DN	Leq D	Leq N	Leq DN	Day	Night
N1	44.5	34.4	42.9	43.6	33.3	41.9	49.2	38.1	47.7	55	45
N2	43.5	32.8	42.0	42.6	32.2	41.0	48.3	36.3	46.7	55	45
N3	43.1	33.7	41.6	42.2	33.0	40.7	48.1	36.8	46.2	55	45
N4	41.9	32.1	40.3	40.8	31.4	39.4	46.3	34.3	44.7	55	45
N5	43.1	32.8	41.5	42.3	32.9	40.6	47.9	37.0	46.1	55	45
N6	42.6	33.3	41.2	41.7	32.6	40.3	47.2	36.6	45.8	55	45

The noise monitoring results **(Table3.12)** show the day and night time noise level at all locations were within the prescribed limit. The major source of the noise in the study area is vehicular movement as well as rural activity. The ambient noise quality standards for daytime are 75, 65, 55 and 50 dB (A) Leq and 70, 55, 45 and 40 dB (A) Leq during night-time for industrial, commercial, residential and silence zone respectively. The daytime noise level measured during 6:00 a.m. to 10:00 p.m. and night-time measured from 10:00 p.m. to 6:00 a.m.

3.5.7 Traffic Density

The traffic survey is essential to realistically and accurately assess the prevailing traffic volumes and travel characteristics by undertaking classified volume count. The objective of traffic volume count survey is to assess the traffic intensity on the most vulnerable section of the road under question. Two – days, 24 hrs., continuous volume counts were manually undertaken during February 2020 on Link Road for capturing the realistic picture of the current volume and composition of traffic motorized i.e., passenger vehicles (two-wheeler, three-wheeler, bicycle, passenger car); utility vehicles (Jeep, Van, Mini Bus, Standard Bus); Goods vehicles – LCV (Freight), MCV (2 axle rigid chassis), MCV (3 axle rigid chassis), MAV and tractor trailer and non-motorized like animal driven cart. The survey work was conducted by engaging educated people familiar with traffic characteristics. Before the start of survey, the enumerated engaged were briefed and trained by an expert supervisor about the task.

The analysis of traffic counts provides an estimate of average daily traffic (ADT). In order to convert recorded vehicles into a common scale, the passenger car units (PCU) equivalent factor as per IRC: 64 -1990 has been adopted. The **Table 3.13** reveals that the total vehicle/day and PCU/day.

Table 3.13: Traffic Volume Counts Near Link Road

Sl. No.	Nomenclature Of Vehicle	PCU factor	Vehicles /day	PCU/day	Vehicles/day	PCU/day	Vehicles/day	PCU/day
			VMC Head (Porthireddy)		HLC Head (Tadparti)		NMC Head(Ravalpally)	
1	Car / Jeep / Van	1	124	124	214	214	151	151
2	Two-Wheelers	0.5	404	202	347	173.5	264	132
3	Three -Wheelers	1	20	20	14	14	9	9
4	Mini- Bus	1.5	15	22.5	21	31.5	8	12
5	Bus	3	34	102	41	123	54	162
6	Tempo / LCV	1.5	20	30	35	52.5	64	96
7	Two Axle Truck	3	80	240	64	192	110	330
8	Three Axle Truck	3	12	36	21	63	18	54
9	> 3 Axle Truck	4.5	0	0	5	22.5	8	36
10	Tractor	1.5	64	96	40	60	54	81
11	Cycle	0.5	245	122.5	314	157	264	132
Total			**1018**	**995**	**1116**	**1103**	**1004**	**1195**
Volume Capacity Ratio				**16.6**		**18.4**		**19.9**
Level of Service				**"A"**		**"A"**		**"A"**

3.6 SOIL

3.6.1 Soil Type

The soil type of Nalgonda district is mainly red soils, Black soils, Alkaline soils and Alluvium (sand and gravel soils). Soils of the district have been classified under four orders Alfisols, Inceptisols, Entisols and Vertisols as per Soil Taxonomy (USDA, 2014).

The major soil resources of Mahabubnagar district are Red sandy soils, sandy loam soils and black soils. Most of the area comes under taxonomically classified soil order Inceptisols followed by Entisols, Alfisols and Vertisols, respectively.

The major soil types of Rangareddy district are red soils, Medium Black soils and Mixed soils. Taxonomically soils had been classified under four soil orders namely Inceptisols, Entisols, Alfisols and Vertisols.

3.6.2 Soil Texture

The soils of the command area are predominately occupied by red soils with gravelly clay-loam to gravelly clay soils. About eight different types of surface textured soils are identified in the total gross command area of the project. The distribution of command area of PRLIS according to surface texture of soils and main canals of the project are assessed and the results are presented in **Table 3.14.** Three types of surface textures of soils viz. Gravelly Loam, Clay and Gravelly Clay textures accounted for about 85 per cent of total gross command area of the project with about 754,531 ha of gross command of the project. Gravelly Loam soil texture is more predominant in majority of the canals. Loam (Calcareous) surface texture of soils is predominant in case of command areas of Hanwada Canal. The surface Soil Texture Map is depicted in **Figure 3.17.**

Table 3.14: Surface Texture of Solis of Goss Command

S No	Texture	GCA (ha)	%
1	Gravelly Loam	419,568	47.47
2	Clay	264,166	29.88
3	Gravelly Clay	70,797	8.01
4	Cracking Clay	48,249	5.46
5	Loam (Calcareous)	21,768	2.46
6	Loam	21,566	2.44
7	Gravelly sandy loam	7,552	0.85
8	Clay (Calcareous)	7	0.00
9	Water bodies	30,272	3.42
	Total	**883,945**	**100.00**

3.6.3 Soil Depth

Soil depth is an important parameter for determining the crops to be grown in a given area. There are large variations in the soil depth of command area of the project. The total gross command area of the project had been classified in to six categories depending upon the soil depth **(Table 3.15).** At the aggregate level three categories of soil depths viz. moderately deep soil depth (50.44%), moderately shallow soil depth (16.77%) and Shallow soil depth (13.68%) accounted for over 80.89 per cent of total gross command area of the project with 714986 ha in these three categories of soil depth. These areas can support any type of cropping in the command area of the project. Three other soil depth categories viz. Very Shallow, Very Deep and Deep accounted for less than 15.69 per cent each of the total gross command area of the project. About 772738 ha of the gross command area accounting for over 87.42 per cent of the total gross command area of the project is in the soil depth category between Very Shallow and Moderately deep. This clearly indicates that the soil depth may not be a constraint in crop planning for the command area. The geographical distribution of gross command area of different main canals across various soil depth categories are presented in **Figure 3.18.**

Table 3.15: Depth of soils in the Command Area

S No	Soil Depth	GCA (ha)	%
1	Moderately deep	445866	50.44
2	Moderately shallow	148229	16.77
3	Shallow	120891	13.68
4	Very Shallow	57752	6.53
5	Deep	26891	3.03
6	Very Deep	54116	6.12
	Water Bodies	30272	3.42
Total		**883945**	**100.00**

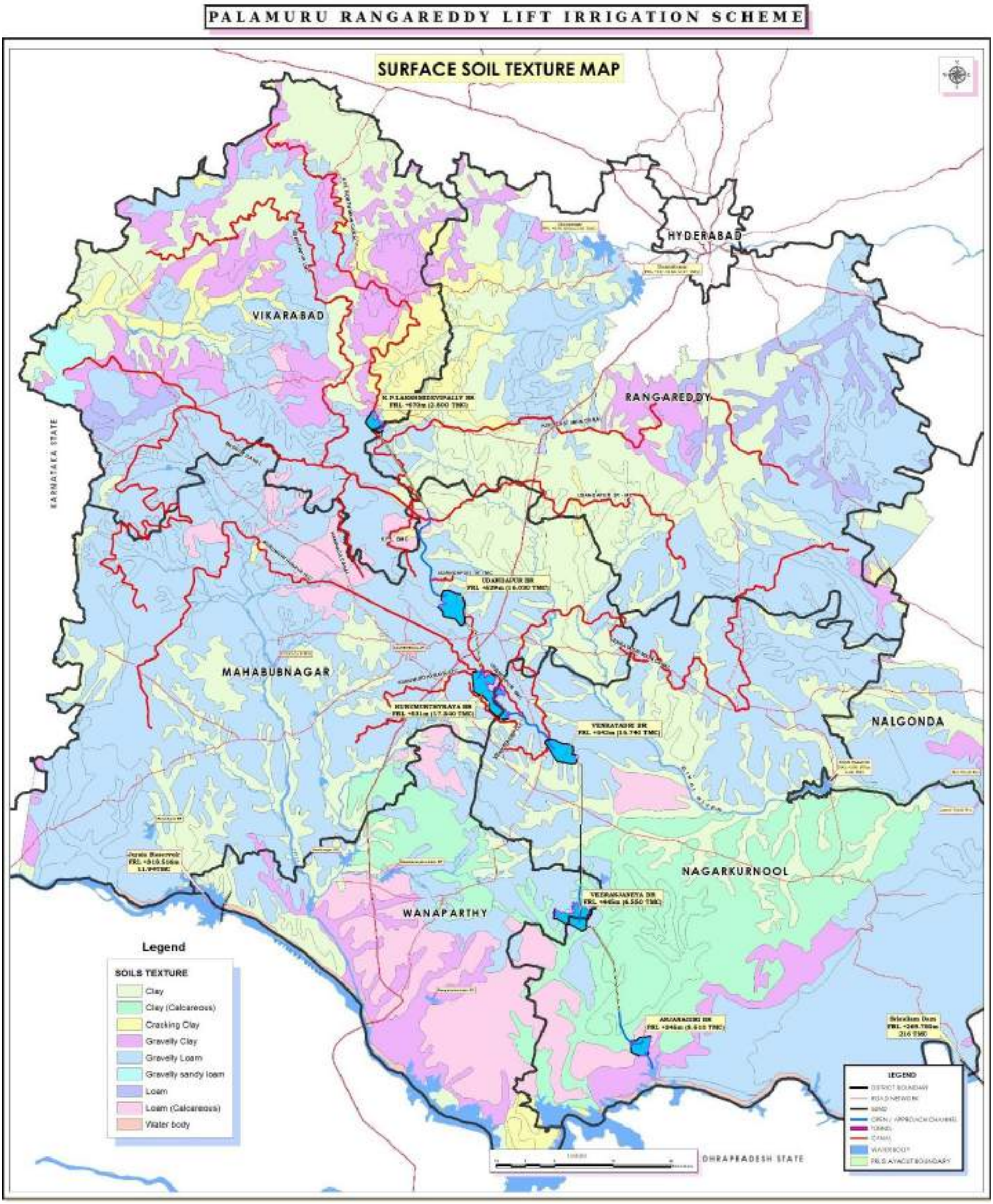


Figure 3.17: Soil Texture Map of Gross Command

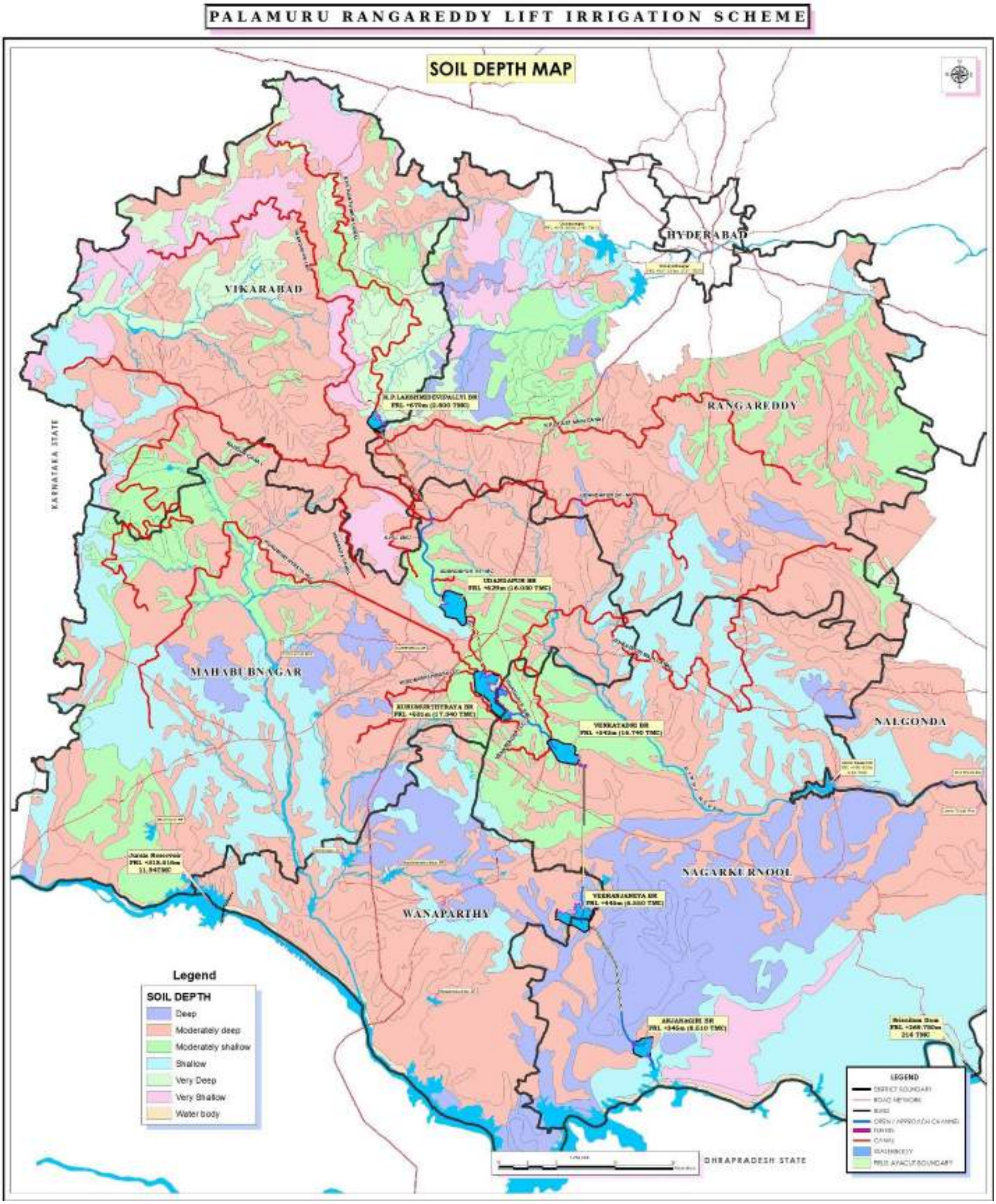


Figure 3.18: Soil Depth Map of Gross Command

3.6.4 Soil Characteristics

Soil fertility is an important aspect of the soil-plant relationship. Fertility status of the soils is primarily and importantly dependent upon both the macro and micronutrient reserve of the soil. Continued removal of nutrients by crops, with little or no replacement will increase the nutrient stress in plants and ultimately lowers the productivity. The fertility status of soil mainly depends upon the nature of vegetation, climate and topography, texture &decomposition rate of organic matter in the soil. Optimum productivity of any cropping systems depends upon adequate supply of plant nutrients.

The fertility of soil depends on the concentration of N, P, K, organic and inorganic materials and water. Nitrogen is required for growth of plant and is a constituent of chlorophyll, plant protein, and nucleic acids. Phosphorus is most often limiting nutrients remains present in plant cell nuclei and act as energy storage. It helps in transfer of energy. Potassium is found in its mineral form and affect plant cell division, carbohydrate formation, translocation of sugar, various enzyme actions and resistance to certain plant disease, over 60 enzymes are known to require potassium for activation.

It is essential to determine the potential of soil in the area to identify the current impacts of urbanization and industrialization on soil quality and predict impacts, which may arise due to the project operations. Accordingly, a study of assessment of the baseline soil quality has been carried out.

3.6.5 Soil Monitoring

For studying soil quality of the study area and with a view to ascertain the impacts due to construction activities on the nearby agriculture land and due to application of water on the soil of command area, seven sampling locations, representing various land use conditions, were selected to assess the existing soil conditions in and around the project area of impact area. The samples have been collected from the depth of 5cm to 15cm and representative samples prepared by thoroughly mixing. The homogenized samples were analysed for physico chemical characteristics.

The detail of sampling locations is given in **Table 3.16 and Figure 3.19**, while the soil quality at all the sampling locations during the study period is tabulated in **Table 3.17** through **Table 3.19.**

Table 3.16: Soil Sampling Location

S. N.	Location Code	Location	Co-ordinates
1	S-1	Boin Palli Village	16°44'27.64"N, 78°20'41.87"E
2	S-2	Munimokesham Village	16°50'42.88"N, 77°51'9.17"E
3	S-3	Madhanapuram Village	16°55'43.62"N, 78°44'4.32"E
4	S-4	Bandanadi Gudur Village	17° 5'53.58"N, 78°30'16.21"E
5	S-5	Medipalle Kalan Village	17°13'53.37"N, 78° 0'46.54"E
6	S-6	Yenkepalle Village	17° 8'57.69"N, 77°37'56.65"E

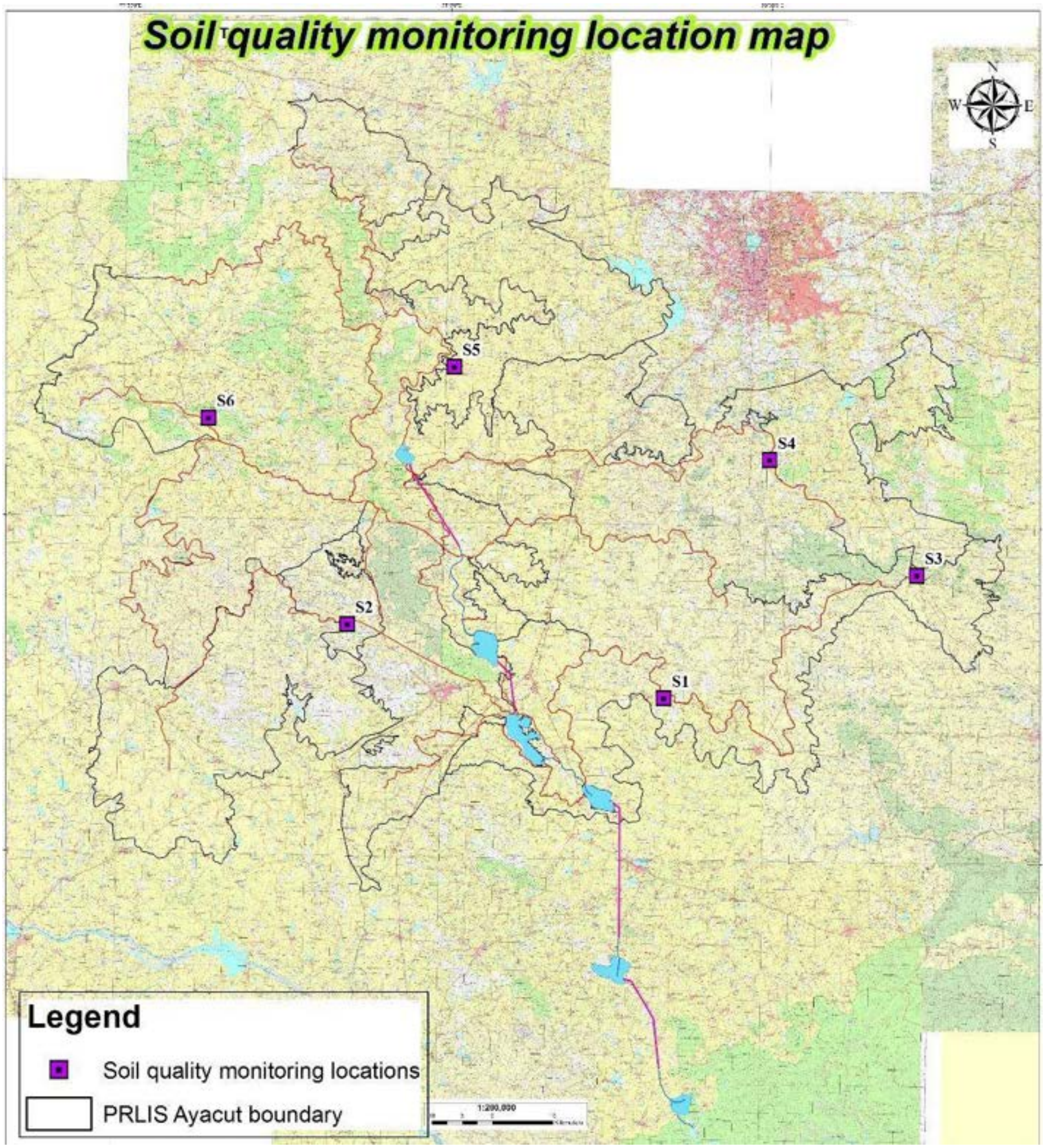


Figure 3.19: Soil Quality Sampling Locations

Table 3.17: Physico-Chemical Characteristics of Soil (Monsoon, 2019)

Sl. No.	Parameter	Units	S-1	S-2	S-3	S-4	S-5	S-6
1.	Texture	-	Clay Loam	Loam	Loam	Clay Loam	Clay Loam	Clay Loam
2.	Sand	%	43.6	38.0	40.4	39.6	33.2	32.0
3.	Silt	%	26.1	38.6	34.8	33.0	32.4	32.2
4.	Clay	%	30.3	23.4	24.8	27.4	34.4	35.8
5.	pH (10% Slurry)	-	7.20	7.61	7.34	7.40	7.45	7.28
6.	El. Conductivity	µs/cm	218	268	231	248	263	274
7.	Organic Matter	%	0.86	1.01	0.88	0.94	1.12	1.10
8.	Bulk density	gm/cc	1.45	1.68	1.65	1.40	0.97	0.88
9.	Porosity	% v/v	46.4	38.3	37.6	45.9	63.2	66.7
10.	S.A. R	-	0.27	0.29	0.34	0.23	0.36	0.26
11.	Calcium as Ca	mg/kg	1770	1795	1686	1810	1912	1825
12.	Magnesium as Mg	mg/kg	255	264	235	265	238	305
13.	Sodium as Na	mg/kg	28	31	35	25	38	29
14.	Potassium as K	mg/kg	140	136	120	117	150	164
15.	Phosphorus as P	mg/kg	8.3	7.4	9.6	9.4	9.5	9.3
16.	Chloride as Cl	mg/kg	71.2	42.6	71.9	67.1	45.8	78.7
17.	Zinc as Zn	mg/kg	1.28	1.86	1.22	1.23	1.45	1.15
18.	Copper as Cu.	mg/kg	1.35	1.48	1.28	1.6	1.8	2.0
19.	Iron as Fe	mg/kg	12.30	14.65	12.5	11.2	16.4	10.5
20.	Nitrogen as N	mg/kg	103.6	92.7	80.9	101.1	120.1	151.5
21.	Organic Carbon	%	0.51	0.57	0.49	0.57	0.64	0.61
22.	Sulphate as SO4	mg/kg	86.9	104.25	82.05	82.25	74.8	80.3
23.	Sulphur as S	mg/kg	18.3	15.65	22.31	18.15	16.26	16.67
24.	Fluoride as F	mg/kg	2.63	3.44	2.9	3.1	2.6	3.5
25.	Selenium as Se	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26.	Manganese as Mn	mg/kg	7.75	10.7	9.5	9.41	12.25	14.25
27.	Chromium as Cr	mg/kg	6.7	5.4	6.3	6.8	4.6	5.4
28.	Nickel as Ni	mg/kg	10.05	11.85	13.3	11.1	9.35	10.37
29.	CEC	meq/100g	8.3	4.7	6.9	6.7	6.4	8.3

Table 3.18: Physico-Chemical Characteristics of Soil (Post- Monsoon, 2019)

Sl. No.	Parameter	Units	S-1	S-2	S-3	S-4	S-5	S-6
1.	Texture	-	ClayLoam	Loam	Loam	ClayLoam	Clay Loam	ClayLoam
2.	Sand	%	43.3	38.3	40.6	39.4	33.4	32.9
3.	Silt	%	26.2	37.4	34.6	32.4	32.6	32.8
4.	Clay	%	30.5	24.3	24.8	28.2	34.0	34.3
5.	pH (10% Slurry)	-	7.23	7.46	7.31	7.40	7.42	7.41
6.	El. Conductivity	µs/cm	256	298	245	265	285	304

Sl. No.	Parameter	Units	S-1	S-2	S-3	S-4	S-5	S-6
7.	Organic Matter	%	0.95	1.2	0.92	1.01	1.20	1.05
8.	Bulk density	gm/cc	1.42	1.58	1.65	1.41	0.99	0.96
9.	Porosity	% v/v	46.2	39.5	37.8	48.2	62.8	64.0
10.	S.A. R	-	0.23	0.27	0.27	0.23	0.33	0.21
11.	Calcium as Ca	mg/kg	1810	1820	1705	1815	1925	1840
12.	Magnesium as Mg	mg/kg	260	252	230	266	228	350
13.	Sodium as Na	mg/kg	25	29	28	25	34	24
14.	Potassium as K	mg/kg	145	147	125	125	160	170
15.	Phosphorus as P	mg/kg	8.4	7.6	9.65	9.55	9.40	9.46
16.	Chloride as Cl	mg/kg	70.2	42.9	70.8	67.0	46.3	77.9
17.	Zinc as Zn	mg/kg	1.27	1.86	1.25	1.30	1.45	1.21
18.	Copper as Cu.	mg/kg	1.36	1.42	1.24	1.64	1.83	2.5
19.	Iron as Fe	mg/kg	12.20	14.6	12.45	11.28	16.34	10.74
20.	Nitrogen as N	mg/kg	108.6	96.5	81.6	101.9	120.4	149.4
21.	Organic Carbon	%	0.55	0.70	0.53	0.59	0.70	0.61
22.	Sulphate as SO4	mg/kg	86.4	104.5	82.2	82.02	74.88	80.39
23.	Sulphur as S	mg/kg	18.35	15.74	22.45	18.10	16.20	16.86
24.	Fluoride as F	mg/kg	2.63	3.41	2.95	3.18	2.52	3.47
25.	Selenium as Se	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26.	Manganese as Mn	mg/kg	7.55	10.75	9.6	9.48	12.2	14.05
27.	Chromium as Cr	mg/kg	6.68	5.39	6.12	6.87	4.5	5.4
28.	Nickel as Ni	mg/kg	10.00	11.45	12.9	11.4	9.10	10.30
29.	CEC	meq/100g	8.6	6.8	7.0	6.7	7.0	8.0

Table 3.19: Physico-Chemical Characteristics of Soil (Pre-Monsoon 2020)

Sl. No.	Parameter	Units	S-1	S-2	S-3	S-4	S-5	S-6
1.	Texture	-	ClayLoam	Loam	Loam	ClayLoam	Clay Loam	ClayLoam
2.	Sand	%	43.6	38.8	40.5	39.2	33.9	32.4
3.	Silt	%	26.2	37.5	35.2	32.2	32.3	32.6
4.	Clay	%	30.2	23.7	24.3	28.6	33.8	35.0
5.	pH (10% Slurry)	-	7.27	7.39	7.36	7.42	7.42	7.48
6.	El. Conductivity	µs/cm	261	291	248	259	284	315
7.	Organic Matter	%	1.01	1.18	0.95	1.04	1.25	1.10
8.	Bulk density	gm/cc	1.45	1.62	1.65	1.41	1.02	0.93
9.	Porosity	% v/v	45.4	38.7	37.6	47.6	62.5	64.9
10.	S.A. R	-	0.21	0.24	0.24	0.22	0.28	0.19
11.	Calcium as Ca	mg/kg	1812	1820	1725	1860	1954	1905

Sl. No.	Parameter	Units	S-1	S-2	S-3	S-4	S-5	S-6
12.	Magnesium as Mg	mg/kg	270	265	245	270	245	380
13.	Sodium as Na	mg/kg	23	26	25	24	30	23
14.	Potassium as K	mg/kg	146	152	135	140	168	185
15.	Phosphorus as P	mg/kg	8.5	7.7	9.5	9.45	9.34	9.29
16.	Chloride as Cl	mg/kg	70.4	43.4	71.5	66.7	46.1	78.1
17.	Zinc as Zn	mg/kg	1.26	1.89	1.23	1.27	1.45	1.24
18.	Copper as Cu.	mg/kg	1.34	1.40	1.21	1.68	1.86	2.61
19.	Iron as Fe	mg/kg	12.14	14.54	12.35	11.26	16.31	10.70
20.	Nitrogen as N	mg/kg	115.6	106.5	84.6	101.7	128.4	168.4
21.	Organic Carbon	%	0.59	0.68	0.55	0.60	0.73	0.64
22.	Sulphate as SO4	mg/kg	86.3	103.1	81.3	82.4	74.75	80.25
23.	Sulphur as S	mg/kg	18.30	15.70	22.51	18.26	16.29	16.75
24.	Fluoride as F	mg/kg	2.61	3.45	2.98	3.22	2.74	3.32
25.	Selenium as Se	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26.	Manganese as Mn	mg/kg	7.45	10.67	9.65	9.41	12.16	13.98
27.	Chromium as Cr	mg/kg	6.65	5.42	6.10	6.91	4.54	5.38
28.	Nickel as Ni	mg/kg	10.05	11.37	12.82	11.46	9.08	10.32
29.	CEC	meq/100g	8.3	7.1	6.6	6.9	7.5	7.7

3.6.6 Soil Reaction Classes, Nutrients Availability and Critical Limits

According to Soil Survey Manual (IARI, 1970), the soils are grouped under different soil reaction classes viz extremely acidic (pH<4.5), very strongly acidic (pH 4.5 – 5.0), strongly acidic (pH 5.1 – 5.5), moderately acidic (pH 5.6-6.0), slightly acidic (pH 6.1-6.5), neutral (pH 6.6- 7.3), slightly alkaline (pH 7.4-7.8), moderately alkaline (pH 7.9-8.4), strongly alkaline (pH 8.5-9.0).The soils are rated as low (below 0.50 %), medium (0.50-0.75 %) and high (above 0.75 %) in case of organic carbon, low (<280 kg ha-1), medium (280 to 560 kg ha-1) and high (>560 kg ha-1) in case of available nitrogen, low (< 10 kg ha-1), medium (10 to 25 kg ha-1) and high (> 25 kg ha-1) for available phosphorus, low (< 108 kg ha-1), medium (108 to 280 kg ha-1) and high (> 280 kg ha-1) for available potassium and low (<10 mg kg-1), medium (10-20 mg kg-1) and high (> 20 mg kg-1) for available sulphur (Singh et. al. 2004, Mehta et. al.1988). Critical limits of Fe, Mn, Zn, Cu and B, which separate deficient from non-deficient soils followed in India, are 4.5, 2.0, 0.5, 0.2 and 0.5 mg kg-1 respectively. (Follet and Lindsay, 1970 and Berger and Truog, 1940).

3.6.7 Interpretation of Soil Characteristics

Interpretation of Soil Characteristic has been dwelled in following sub-sections:

Soil Texture: The soil textures refer to proportion of mineral composition of soil i.e., sand, clay and silt present in the soil sample. The most commonly observed soil textures are loam and clay loam.

Soil pH: Soil pH is an important soil property, which affects the availability of several plant nutrients. It is a measure of acidity and alkalinity and reflects the status of base saturation. It measures the -ve logarithm of hydrogen ions activity of soil solution and defines the soil acidity and alkanity. The soil pH ranges from 7.20 to 7.61, thereby indicating the soils are neutral to slightly alkaline.

Organic Matter: The effect of soil organic matter on soil properties is well recognized. Soil organic matter plays a vital role in supplying plant nutrients, cation exchange capacity, improving soil aggregation and hence water retention and soil biological activity. The organic carbon content of soil varied from 0.49 to 0.73%, thereby implying that soils are low to medium in organic carbon.

Macronutrients: Nutrients like nitrogen (N), phosphorus (P) and potassium (K) are considered as primary nutrients and sulphur (S) as secondary nutrient. These nutrients help in proper growth, development and yield differentiation of plants and are generally required by plants in large quantity.

Available Nitrogen: Nitrogen is an integral component of many compounds including chlorophyll and enzyme essential for plant growth. It is an essential constituent for amino acids which is building blocks for plant tissue, cell nuclei and protoplasm. It encourages the above ground vegetative growth and deep green colour to leaves. Deficiency of Nitrogen decreasing rate and extent of protein-synthesis and result into stunted growth and develop chlorosis. Available nitrogen content in the surface soils ranges between 80.9 to 168.4 mg/kg (133.5 to 185.2kg/ha) thereby is indicating that soils are low in available nitrogen content.

Available Phosphorus: Phosphorus is important component of adenosine di-phosphate (ADP) and adenosine tri-phosphate (ATP), which involves in energy transformation in plant. It is essential component of deoxyribonucleic acid (DNA), the seat of genetic inheritance in plant and animal. Phosphorous take part in important functions like photosynthesis, nitrogen fixation, crop maturation, root development, strengthening straw in cereal crops etc. The availability of phosphorous is restricted under acidic and alkaline soil reaction mainly due to P-fixation. In acidic condition it gets fixed with aluminium and iron and in alkaline condition with calcium. Available phosphorus content ranges between 7.4 to 9.65 mg/kg (12.1 to 15.9 kg/ha) thereby indicating that soils are medium in available phosphorus.

Available Potassium: Potassium is an activator of various enzymes responsible for plant processes like energy metabolism, starch synthesis, nitrate reduction and sugar degradation. It is extremely mobile in plant and help to regulate opening and closing of stomata in the leaves and uptake of water by root cells. It is important in grain formation and tuber development and encourages crop resistance for certain fungal and bacterial diseases. Available potassium content in these soils ranges between 117 to 185 mg/kg (167.3 to 204kg/ha), thereby indicating medium in potassium content in the area.

Micronutrients: Proper understanding of micronutrients availability in soils and extent of their deficiencies is the pre-requisite for efficient management of micronutrient fertilizer to sustain crop productivity. Therefore, it is essential to know the micronutrients status of soil before introducing any type of land use.

Available Manganese: Manganese is essential in photosynthesis and nitrogen transformations in plants. It activates decarboxylase, dehydrogenize, and oxides enzymes. The available manganese content in surface soils ranged from 7.4 to 14.25 mg/kg i.e., above the critical limit of available manganese (2.0mg/kg)

Available Zinc: Zinc plays role in protein synthesis, reproductive process of certain plants and in the formation of starch and some growth hormones. It promotes seed maturation and production. As zinc content in soil of study area ranged from 1.15 to 1.89 mg/kg which is more than the critical limit (0.5mg/kg), most of the study area soils are more than sufficient in available zinc.

Available Copper: It is important for reproduction growth. It aids in root metabolism and helps in utilization of protein. The available copper in surface soils of the study area ranges from 1.21 to 2.61 mg/kg. As per the critical limit of available copper (0.2mg/kg), most of the study area soils are more than sufficient in available copper in the vicinity of the project.

Available Iron: Iron in soil is important for formation of chlorophyll. The available iron in surface soils of the study area ranges from 10.5 to 16.4mg/kg. As per the critical limit of available iron(4.5mg/kg), most of the study area soils are more than sufficient in available iron in the vicinity of the project.

3.7 WATER QUALITY

Selected water quality parameters of ground water and surface water resources within 10 km radius of the study area has been studied for assessing the water environment and evaluate anticipated impact of the construction activity. Understanding the water quality is essential in preparation of Environmental Impact Assessment and to identify critical issues with a view to suggest appropriate mitigation measures for implementation. The purpose of this study is to:

- Assess the water quality characteristics for critical parameters; and
- Predict the impact of water quality by these mining and related activities.

The information required has been collected through primary surveys and secondary sources. Five groundwater sources and five surface water source covering 10 km radial distance were examined for physico-chemical, heavy metals and bacteriological parameters in order to assess the effect of existing industrial and other activities on water. The samples were collected and analysed once during the study period. Water sampling and analysis has been carried out to determine the existing baseline water quality around the project area. Sampling and analysis have been carried out with following standard guidelines for physical, chemical and bacteriological parameters. Six ground water and six surface water sampling locations from the study area have been selected which is presented in **Table 3.20** and **Figure 3.20** and **Figure 3.21.**

Table 3.20: Water Quality Monitoring Locations

S. No.	Station Code	Locations	Co-ordinates
Ground Water			
1	GW1	Boin Palli Village	16°44'32.94"N, 78°20'53.19"E
2	GW2	Munimokesham Village	16°50'47.40"N, 77°51'4.60"E
3	GW3	Madhanapuram Village	16°55'41.37"N, 78°44'11.74"E
4	GW4	Bandanadi Gudur Village	17°5'54.17"N, 78°30'19.87"E
5	GW5	Medipalle Kalan Village	17°13'55.34"N, 78° 0'45.35"E
6	GW6	Yenkepalle Village	17°9'8.30"N, 77°38'2.17"E
Surface Water			
1	SW1	Boin Palli Village	16°44'18.06"N, 78°20'56.08"E
2	SW2	Munimokesham Village	16°50'43.78"N, 77°51'11.54"E
3	SW3	Madhanapuram Village	16°55'40.95"N, 78°44'5.86"E
4	SW4	Bandanadi Gudur Village	17° 6'20.63"N, 78°30'21.48"E
5	SW5	Medipalle Kalan Village	17°14'26.75"N, 78° 2'58.44"E
6	SW6	Yenkepalle Village	17° 9'8.65"N, 77°38'8.41"E
7	SW7	500 m Upstream of Water sourcing area	16° 6'27.61"N, 78°24'29.72"E
8	SW8	500 m downstream of Water sourcing area	16° 5'39.45"N, 78°23'57.99"E

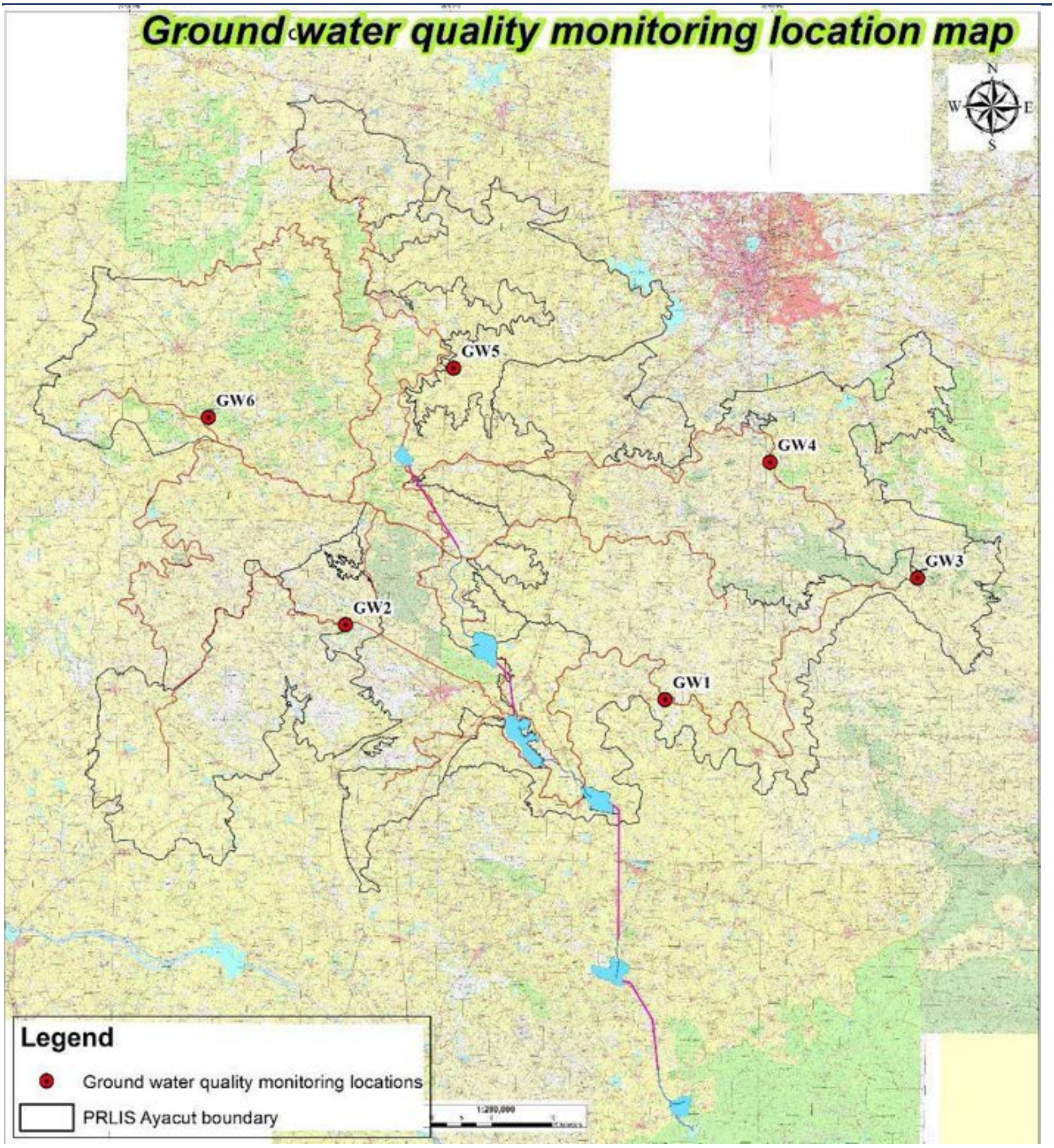


Figure 3.20: Ground Water Quality Sampling Locations

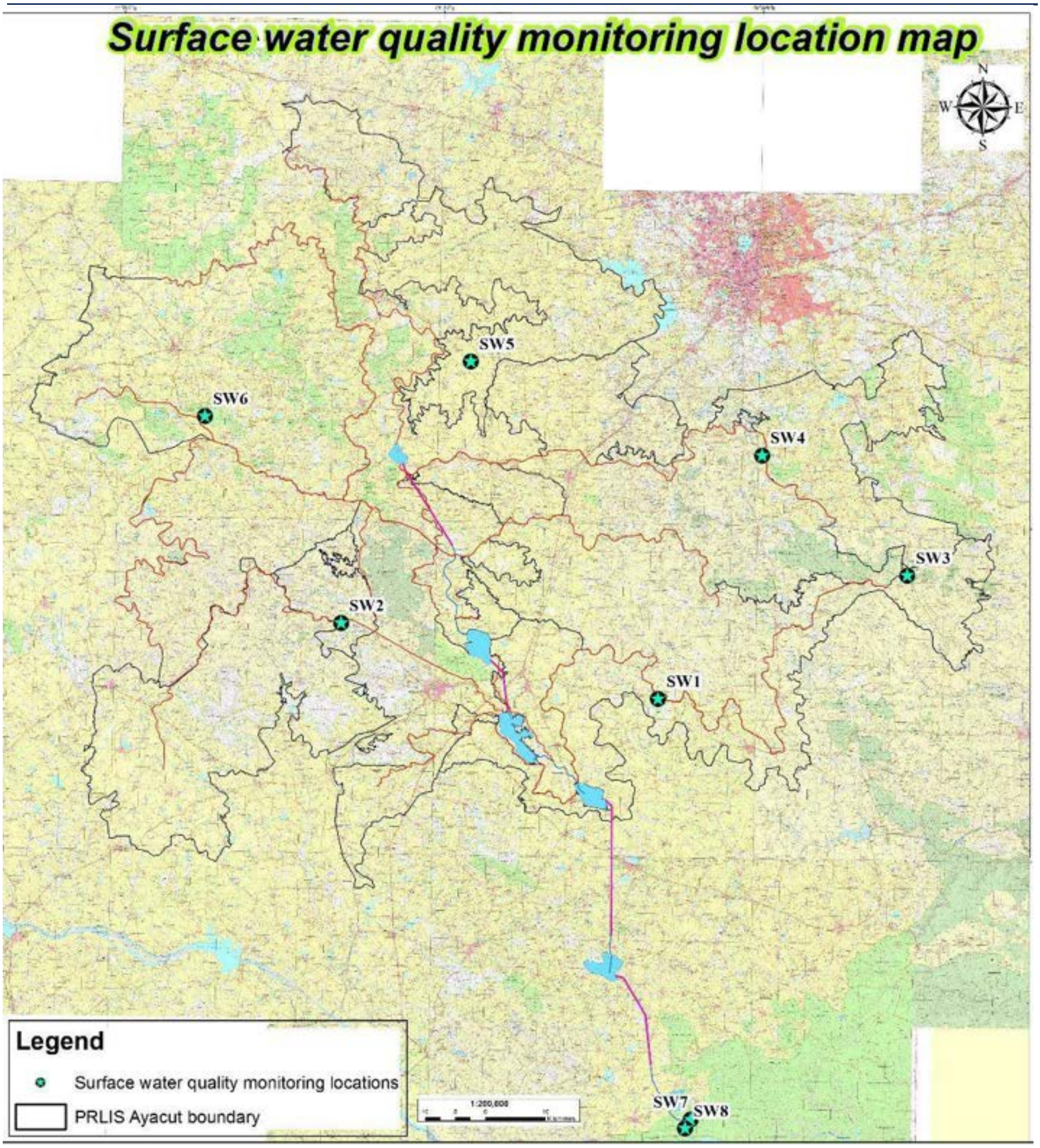


Figure 3.21: Surface Water Quality Sampling Locations

3.7.1 Sampling and Analytical Procedure

Analyses of the samples were carried out as per established standard methods and procedures prescribed by CPCB, IS 3025 Codes and APHA 22nd edition, 2012. Samples for chemical analysis were collected in polyethylene carboys. Samples collected for metal content were acidified with 1 ml HNO3. Parameters like dissolved oxygen (DO) and pH were analysed at the time of sample collection. The basic precautions were taken to avoid any contamination during the sampling. The methodology for sample collection and preservation techniques was followed as per **Table 3.21** and analysis methodology is given in **Table 3.22.**

Table 3.21: Standard Operating Procedure for Water Sampling & Analysis

Sl. No.	Parameter	Sample Collection	Sample Size	Storage/Preservation
1	pH	Grab sampling plastic/glass container	50 ml	On site analysis
2	Electrical Conductivity	Grab sampling plastic/glass container	50 ml	On site analysis
3	Total Dissolved Solids	Grab sampling plastic/glass container	100 ml	Refrigeration, can be stored for 7 days
4	Residual Chlorine	Grab sampling plastic/glass container	50 ml	On site analysis
5	Hardness	Grab sampling plastic/glass container	100 ml	Add HNO3 to pH<2, refrigeration; 6 months
6	Chlorides	Grab sampling plastic/glass container	50 ml	Not required; 28 days
7	Sulphates	Grab sampling plastic/glass container	100 ml	Refrigeration; 28 days
8	Sodium, Potassium	Plastic container	100 ml	Not required; 6 months
9	Nitrates	Plastic container	100 ml	Refrigeration; 48 hrs
10	Fluorides	Plastic container only	100 ml	Not required; 28 days
11	Alkalinity	Plastic/glass containers	100 ml	Refrigeration; 14 days
12	Ammonia	Plastic/glass containers	100 ml	Add H2SO4 to pH<2, refrigeration, 28 days
13	Hexavalent Chromium, Cr+6	Plastic/Glass rinse with 1+1 HNO3	100 ml	Grab Sample; refrigeration; 24 hrs
14	Heavy metals (Hg, Cd, Cr, Cu, Fe, Zn, Pb etc.)	Plastic/Glass rinse with 1+1 HNO3	500 ml	Filter, add HNO3 to pH< 2; Grab sample; 6 months

Table 3.22: Analytical Procedure

S. N.	Parameters	Analytical Method	Reference
1	pH	pH meter	IS: 3025 (Part-11)
2	Turbidity	Nephelo Meter	IS: 3025 (Part-10)
3	Conductivity (at 25 C)	Conductivity meter	APHA 22st edition, 2510 B:2012
4	Total Dissolve Solids	Gravimetric	IS: 3025 (Part-16)
5	Alkalinity as CaCO3	Titrimetrically	IS: 3025 (Part-23)
7	Total Hardness as CaCO3	Titrimetrically	IS: 3025 (Part-21)
8	Calcium as Ca	Titrimetrically	IS: 3025 (Part-40)
9	Magnesium as Mg	Calculation	APHA 22st edition,3500 Mg B:2012
10	Sodium	Flame Photometric	APHA 22ndedition, 3500 Na B:2012
11	Potassium	Photometric	APHA 22nd edition,3500 K-B:2012
12	Chloride as Cl	Argentometric	IS: 3025 (Part-32)
13	Sulphate as SO4	Turbidimetric	IS: 3025 (Part-24)
14	Nitrate as NO3	Spectro photometric	IS: 3025 (Part-34)
15	Phosphate	Spectro-photometric	IS: 3025 (Part-31)
16	Fluoride as F	Ion-meter	APHA 22ndedition,4500 F- D:2012
17	Phenolic compound as C6H5OH	Spectro-photometric	IS: 3025 (Part-43)
18	Cyanide	Spectro-photometric	IS: 3025 (Part-27)
19	Dissolve Oxygen	Winkler Method	IS:3025 (Part-38), Reaffirmed 2009
20	Oil & Grease	Gravimetric	IS:3025 (Part 39), 1991 (Reaffirmed 2003)
21	Arsenic	AAS	IS: 3025 (Part-37)
22	Cadmium	AAS	IS: 3025 (Part-41)
23	Total Chromium	AAS	IS: 3025 (Part-52)
24	Iron	AAS	IS:3025 (Part-53), Reaffirmed 2009
25	Copper	AAS	IS: 3025 (Part-42)
26	Lead	AAS	IS: 3025 (Part-47)
27	Manganese	AAS	IS: 3025 (Part-59)
28	Mercury	AAS	IS: 3025 (Part-48)
29	Zinc	AAS	IS: 3025 (Part-49)
30	Dissolved Oxygen	-	IS: 3025 (Part-38) 1989 (RA-2009)
31	Chemical Oxygen Demand	-	IS: 3025 (Part-58) 1989 (RA-2012)
32	Biological Oxygen Demand	-	IS: 3025 (Part-44) 1989 (RA-2009)
33	Total Coliform	MPN Method	IS: 1622: 1981

The error in ion-balance computation, considering the relationship between the total cations (Ca2+, Mg2+, Na+, K+) and the total anions (NO3-, SO42-, HCO3- and Cl-) for each set of complete analyses of water sample, is observed to be within the range of acceptability (±2%) used in most laboratories (APHA 22nd Ed).

3.7.2 Interpretation of Physico - Chemical Characteristics of Ground Water

Table 3.23 through **Table 3.25 show** the physico - chemical characteristics of ground water samples collected from the selected villages during monsoon (2019), post-monsoon (2019) and Pre-Monsoon (2020) as compared with the standard (IS 10500: 2012). The analysis results indicate that:

- **pH**: This parameter generally indicates the acid or alkaline nature of any solution and usually does not bear any direct impact on consumers. The pH value ranged from 7.12 (GW-3) to 8.12 (GW-2) in monsoon, 7.06 (GW-3) to 7.92 (GW-2) in post – monsoon and 7.13 (GW-1) to 7.89 (GW-2) in pre-monsoon in the collected water samples which do not exceed the recommended limit (6.5 - 8.5) of BIS. The water samples were slightly alkaline. The reason for such conditions may be due to different types of buffers that may be present in the groundwater and presence of weak basic salt in the soil.
- **Turbidity:** The turbidity denotes the impurity of the water. Turbid nature of the water may be attributed due to colloidal and extremely fine dispersion of sediments, micro-organisms and organic matter. The turbidity in all the water samples in each season was found below the acceptable limit.
- **Total Hardness:** The total hardness is an important parameter of water quality. Hard water makes it difficult for domestic water users to form lather when washing. Hardness is defined as the concentration of calcium and magnesium in water expressed as the equivalent of calcium carbonate ($CaCO_3$). In the study area, the total hardness ranges between 98 mg/l (GW-2) and623 mg/l (GW-1) in monsoon season,110 mg/l (GW-2) and 699 mg/l (GW-1) in post-monsoon season and 126 mg/l (GW-2) and798 mg/l (GW-1) in pre-monsoon season and which is found below than the acceptable limit as per IS10500:2012.
- **Chloride**: Chloride concentration is ranged between 20.5 mg/l (GW-5) and 241.9 mg/l (GW-1) in monsoon,23 mg/l (GW-5) and 271.4 mg/l (GW-1) in post-monsoon, and 26.3 mg/l (GW-5) and 309.8 mg/l (GW-1) in pre-monsoon which is found much below than the permissible limit as per IS 10500:2012(1000 mg/l) but exceeds in post-monsoon and in winter season in GW-1(250 mg/l).
- **Alkalinity:** Alkaline nature of the samples is generally attributed to the presence of carbonates and bi-carbonates. Though alkalinity is not harmful to human health, its presence in the water imparts an unpleasant taste. Alkalinity of water is due to presence of bicarbonate, carbonate and strong bases. The alkalinity of the samples is recorded from 98 mg/l (GW-2) to328 mg/l (GW-5) in monsoon season, from110 mg/l (GW-2) to368 mg/l (GW-5) in post-monsoon season, and from126 mg/l (GW-2) to 420 mg/l (GW-5) in pre-monsoon season and found well within the permissible limit as per IS 10500:2012 (600 mg/l).
- **TDS:** The TDS concentration recorded from the ground water samples ranged from 302 mg/l (GW-3) to 1122 mg/l (GW-1) in monsoon season, from 339 mg/l (GW-3) to 1259 mg/l (GW-5) in post-monsoon season, and from 386 mg/l (GW-3) to 1436mg/l (GW-1) in pre-monsoon season and found well within the permissible limit as per IS 10500:2012(500 mg/l).

- **Sulphate:** Sulphate is a naturally occurring element found in groundwater. Sulphate concentration was found in the range of 22.3 mg/l **(**GW-6) to209 mg/l (GW-1) in monsoon season, from25 mg/l (GW-6) to235.2 mg/l (GW-1) in post-monsoon season, and from 28.6 mg/l **(**GW-6) to268.5mg/l (GW-1) in pre-monsoon season. The BIS acceptable limit for sulphate in drinking water is 400 mg/l but exceeds the acceptable limit, i.e., 200 mg/l in GW-1in every season.

Table 3.23: Ground Water Quality in The Study Area (Monsoon Season, 2019)

Sl. No.	Parameter	Units	Requirement (Desirable Limits)	Permissible Limits in absence of alternate source	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
1.	pH at 25 °C	-	6.5 – 8.5	NR	7.29	8.12	7.12	7.23	7.68	7.45
2.	Color	Hazen	5	15	<01	<01	<01	<01	<01	<01
3.	Turbidity	NTU	1	5	1.5	1.60	1.5	1.2	1.2	1.6
4.	TSS	mg/l			5	6	5	4	4	6
5.	Total Dissolve solids	mg/l	500	2000	1122	314	302	568	541	563
6.	Total Hardness as $CaCO_3$	mg/l	200	600	623	98	141	326	329	332
7.	Total Alkalinity	mg/l	200	600	303	98	148	238	328	295
8.	Calcium as Ca	mg/l	75	200	138	23	33	92	72	69
9.	Magnesium as Mg	mg/l	30	100	66.9	9.8	13.8	23.6	39.4	37.4
10.	Chloride as Cl	mg/l	250	1000	241.9	53.3	24.9	59.2	20.5	61.2
11.	Residual Free Chlorine	mg/l	0.2	1.0	<0.001	<0.001	<0.001	<0.02	<0.02	<0.02
12.	Phenolic Compounds	mg/l	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
13.	Mineral Oil	mg/l	0.5	No relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
14.	Sulphate as SO_4	mg/l	200	400	209.7	52.9	27.3	69.1	27.4	22.3
15.	Fluorides as F^-	mg/l	1.0	1.5	0.8	0.3	0.3	0.4	0.5	0.6
16.	Nitrates as NO_3	mg/l	45	No relaxation	10.3	4.2	4.1	7.3	6.4	7.7
17.	Iron as Fe	mg/l	1.0	No relaxation	0.2	0.1	0.1	0.1	0.1	0.1
18.	Zinc as Zn	mg/l	5	15	<0.001	<0.001	<0.001	<0.001	<0.001	0.011
19.	Lead as Pb	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20.	Arsenic as orc	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21.	Mercury as Hg	mg/l	0.001	No relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
22.	Cadmium as Cd	mg/l	0.003	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Sl. No.	Parameter	Units	Requirement (Desirable Limits)	Permissible Limits in absence of alternate source	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
23.	Total Chromium	mg/l	0.05	No relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
24.	Copper as Cu	mg/l	0.05	1.5	0.005	<0.001	<0.001	0.06	<0.001	<0.001
25.	Manganese as Mn	mg/l	0.1	0.3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26.	Selenium as Se	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27.	Cyanide as CN	mg/l	0.05	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28.	Aluminium as Al	mg/l	0.03	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
29.	Boron as B	mg/l	0.5	1.0	<0.001	<0.001	<0.001	0.008	0.004	0.018
30.	Pesticide Residue	µg/L	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
31.	Coli form	MPN/250ml	Should not be detected	Should not be detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
32.	E. Coli	MPN/250ml	Should not be detected	Should not be detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected

Table 3.24: Ground Water Quality in The Study Area (Post- Monsoon Season, 2019)

S. N.	Parameter	Units	Requirement (Desirable Limits)	Permissible Limits in absence of alternate source	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
1.	pH at 25 ^{o}C	-	6.5 – 8.5	NR	7.11	7.85	7.06	7.21	7.69	7.28
2.	Color	Hazen	5	15	<01	<01	<01	<01	<01	<01
3.	Turbidity	NTU	1	5	1.4	1.6	1.4	1.4	1.3	1.4
4.	TSS	mg/l			5	6	5	5	4	5
5.	Total Dissolve solids	mg/l	500	2000	1259	348	345	656	617	654
6.	Total Hardness as $CaCO_3$	mg/l	200	600	699	110	156	382	375	374
7.	Total Alkalinity	mg/l	200	600	340	110	159	261	368	334
8.	Calcium as Ca	mg/l	75	200	155	26	37	106	84	77
9.	Magnesium as Mg	mg/l	30	100	75.1	11.0	15.5	26.7	44.3	42.4
10.	Chloride as Cl	mg/l	250	1000	271.4	59.8	27.8	65.3	23.0	69.9
11.	Residual Free Chlorine	mg/l	0.2	1.0	<0.001	<0.001	<0.001	<0.02	<0.02	<0.02
12.	Phenolic Compounds	mg/l	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
13.	Mineral Oil	mg/l	0.5	No relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
14.	Sulphate as SO_4	mg/l	200	400	235.2	58.7	30.6	76.7	30.3	25.0
15.	Fluorides as F^-	mg/l	1.0	1.5	0.8	0.4	0.4	0.5	0.6	0.6
16.	Nitrates as NO_3	mg/l	45	No relaxation	11.6	4.7	4.6	8.2	7.2	8.6
17.	Iron as Fe	mg/l	1.0	No relaxation	0.18	0.14	0.13	0.08	0.12	0.13

S. N.	Parameter	Units	Requirement (Desirable Limits)	Permissible Limits in absence of alternate source	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
18.	Zinc as Zn	mg/l	5	15	0.038	0.010	0.006	0.018	<0.001	<0.001
19.	Lead as Pb	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20.	Arsenic as orc	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21.	Mercury as Hg	mg/l	0.001	No relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
22.	Cadmium as Cd	mg/l	0.003	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23.	Total Chromium	mg/l	0.05	No relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
24.	Copper as Cu	mg/l	0.05	1.5	0.016	<0.001	<0.001	<0.001	<0.001	<0.001
25.	Manganese as Mn	mg/l	0.1	0.3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26.	Selenium as Se	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27.	Cyanide as CN	mg/l	0.05	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28.	Aluminium as Al	mg/l	0.03	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
29.	Boron as B	mg/l	0.5	1.0	0.003	<0.001	<0.001	0.008	0.004	0.018
30.	Pesticide Residue	µg/L	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
31.	Coli form	MPN/250ml	Should not detected	Should not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
32.	E. Coli	MPN/250ml	Should not detected	Should not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected

Table 3.25: Ground Water Quality in The Study Area (Pre-Monsoon, 2020)

S. No.	Parameter	Units	Requirement (Desirable Limits)	Permissible Limits in absence of alternate source	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
1.	pH at 25 °C	-	6.5 – 8.5	NR	7.13	7.82	7.16	7.16	7.61	7.34
2.	Color	Hazen	5	15	<01	<01	<01	<01	<01	<01
3.	Turbidity (NTU)	NTU	1	5	1.1	1.3	1.2	1.2	1.1	1.4
4.	TSS	mg/l			3	5	4	4	4	5
5.	Total Dissolve solids	mg/l	500	2000	1436	387	382	726	696	743
6.	Total Hardness as $CaCO_3$	mg/l	200	600	798	126	181	424	440	426
7.	Total Alkalinity	mg/l	200	600	389	126	189	308	423	383
8.	Calcium as Ca	mg/l	75	200	176	29	44	116	96	91
9.	Magnesium as Mg	mg/l	30	100	85.7	12.6	19.1	32.8	58.2	49.1
10.	Chloride as Cl	mg/l	250	1000	309.8	68.7	31.5	71.4	26.3	76.7
11.	Residual Free Chlorine	mg/l	0.2	1.0	<0.001	<0.001	<0.001	<0.02	<0.02	<0.02
12.	Phenolic Compounds	mg/l	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
13.	Mineral Oil	mg/l	0.5	No relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
14.	Sulphate as SO_4	mg/l	200	400	268.5	67.2	35.0	88.1	35.2	28.6
15.	Fluorides as F^-	mg/l	1.0	1.5	1.0	0.4	0.4	0.5	0.6	0.7
16.	Nitrates as NO_3	mg/l	45	No relaxation	13.2	5.6	5.3	9.4	8.2	9.7
17.	Iron as Fe	mg/l	1.0	No relaxation	0.2	0.1	0.1	0.2	0.1	0.1
18.	Zinc as Zn	mg/l	5	15	0.042	0.014	0.011	0.020	<0.001	0.011

S. No.	Parameter	Units	Requirement (Desirable Limits)	Permissible Limits in absence of alternate source	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
19.	Lead as Pb	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20.	Arsenic as orc	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21.	Mercury as Hg	mg/l	0.001	No relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
22.	Cadmium as Cd	mg/l	0.003	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23.	Total Chromium	mg/l	0.05	No relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
24.	Copper as Cu	mg/l	0.05	1.5	0.019	<0.001	<0.001	0.018	0.011	0.021
25.	Manganese as Mn	mg/l	0.1	0.3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26.	Selenium as Se	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27.	Cyanide as CN	mg/l	0.05	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28.	Aluminium as Al	mg/l	0.03	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
29.	Boron as B	mg/l	0.5	1.0	0.003	<0.001	<0.001	0.011	0.009	0.012
30.	Pesticide Residue	µg/L	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
31.	Coli form	MPN/250ml	Should not detected	Should not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
32.	E. Coli	MPN/250ml	Should not detected	Should not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected

3.7.3 Interpretation of Physico - Chemical Characteristics of Surface Water

Table 3.26 through **Table 3.28** shows the physico-chemical characteristics of surface water samples collected from upstream and downstream of river/nala, during three season and compared with IS 2296:1992 reference values.

The pH values of analysed samples ranged between 7.62 – 8.45 and are within the acceptable limit (6.5-8.5). The TDS levels ranged from 149 to248 mg/l and were less than the desirable limit of 500 mg/l. Total hardness levels ranged from 50 to 130 mg/l and were well below the acceptable limit of 200 mg/l. The dissolved oxygen values ranged between 2.5-9.7 mg/l and in respect of six samples for all season it was less than 4mg/l, i.e., the limit under CPCB Water Quality Criteria for designated best use (C), while in Samples from Srisailam reservoir (SW-7 &SW-8), it was more than 6mg/l.

The chlorides level in surface water samples ranged from 20 -50 mg/l and were below the acceptable limit of 250 mg/l. The sulphates level ranged from 18.5 to 37 mg/l and were below the acceptable limit of 200 mg/l. The nitrate level ranged from 2.6 to 4.2 mg/l and were below the acceptable limit of 45 mg/l. The BOD values ranged between <3.0 to 9mg/l and in six samples (SW-1 ro SW-6) for all season exceeded the CPCB criteria of less than 3mg/l or less for Class C water, whereas it was less than 3mg/l for two samples taken from Srisailam reservoir (SW-7&SW-8). The Total Coliform level were less than 5000 MPN/100ml, the limits specified for Class C water under CPCB Water Quality Criteria for designated best use. The water is suitable for meeting drinking water requirements after conventional treatment and disinfection. The water to be lifted from Srisailam reservoir is also suitable for irrigation purpose as it conforms to the CPCB Criteria for best designated use for Irrigation (Class -E water) in so far as (i) pH values are between 6.0 to 8.5; (ii) EC is less than 2250 µS/cm: (iii) SAR varies between0.58-0.89 i.e., less than 26 and Boron is less than 2mg/l.

Table 3.26: Surface Water Quality in Monsoon-2019

S. N.	Parameter	Units	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8
1.	pH at 25 °C	-	8.15	7.87	8.10	7.76	7.87	7.91	8.32	8.45
2.	Color	Hazen	50	40	30	50	40	30	80	80
3.	Turbidity	NTU	16.5	12.4	9.6	11.7	13.6	8.30	26.4	42.6
4.	EC	µS/cm	230	332	332	278	290	2545	224	245
5.	Total Dissolve solids	mg/l	151	218	218	181	190	162	149	162
6.	Total Hardness as $CaCO_3$	mg/l	82	120	130	102	100	84	60	50
7.	Total Alkalinity	mg/l	66	100	120	85	94	70	55	50
8.	Calcium as Ca	mg/l	20	28.0	28.4	24.5	20.0	20.4	14.0	12
9.	Magnesium as Mg	mg/l	7.9	12.0	14.8	9.6	12.5	7.2	5.8	4.8
10.	Sodium as Na	mg/l	15	21	23	19	15	16	12	10
11.	Chloride as Cl	mg/l	24.6	35.0	50.0	30.0	35.0	30.0	20	20
12.	Residual Free Chlorine	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
13.	Phenolic Compounds	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
14.	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15.	Sulphate as SO_4	mg/l	18.5	31.4	21.6	34.3	32.0	23.9	32	37
16.	Fluorides as F^-	mg/l	0.11	0.20	0.18	0.14	0.14	0.10	0.20	0.20
17.	Nitrates as NO_3	mg/l	2.6	3.8	4.0	3.1	3.4	3.1	3.1	3.1
18.	Iron as Fe	mg/l	0.02	0.04	0.06	0.04	0.04	0.04	0.06	0.06
19.	Zinc as Zn	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20.	Lead as Pb	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21.	Arsenic as orc	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22.	Mercury as Hg	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

S. N.	Parameter	Units	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8
23.	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24.	Total Chromium	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
25.	Copper as Cu	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26.	Manganese as Mn	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27.	Selenium as Se	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28.	Cyanide as CN	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
29.	Aluminium as Al	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
30.	Boron as B	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
31.	DO	mg/l	3.7	3.2	3.1	2.9	3.0	2.8	6.8	6.7
32.	COD	mg/l	20	30	30	40	20	30	12	14
33.	BOD	mg/l	06	08	07	09	07	06	<3.0	<3.0
34.	SAR	-	0.72	0.84	0.87	0.83	0.65	0.78	0.68	0.61
35.	Coliform	MPN/250ml	2500	1800	1200	900	2100	1200	455	630
36.	E. Coli	MPN/250ml								

Table 3.27: Surface Water Quality in Post-Monsoon-2019

S. No.	Parameter	Units	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8
1.	pH at 25 °C	-	7.82	7.95	8.07	7.62	8.12	7.73	8.17	8.12
2.	Color	Hazen	10	20	20	10	30	20	60	60
3.	Turbidity (NTU)	NTU	8.91	10.2	6.8	7.63	5.86	4.30	18.2	12.6
4.	EC	µS/cm	260	308	315	381	270	233	255	280
5.	Total Dissolved solids	mg/l	169	196	211	248	176	156	163	182
6.	Total Hardness as $CaCO_3$	mg/l	92	113	118	130	90	104	60	70
7.	Total Alkalinity	mg/l	74	81	113	120	80	83	60	68
8.	Calcium as Ca	mg/l	21.2	23.8	28.4	31.6	20.0	24.6	14.0	16.0
9.	Magnesium as Mg	mg/l	8.8	12.1	12.6	12.3	9.8	9.6	6.1	7.0
10.	Sodium as Na	mg/l	15.3	17.6	21.3	23.1	16.2	18.5	10.3	11.5
11.	Chloride as Cl	mg/l	27.6	40.8	39.8	45.2	25.4	25.0	25	25
12.	Residual Free Chlorine	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
13.	Phenolic Compounds	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
14.	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15.	Sulphate as SO_4	mg/l	20.1	26.2	37.0	25.3	33.7	18.5	26	22
16.	Fluorides as F^-	mg/l	0.2	0.21	0.17	0.29	0.12	0.16	0.28	0.28
17.	Nitrates as NO_3	mg/l	2.9	3.2	3.7	4.2	3.4	3.5	3.4	3.4
18.	Iron as Fe	mg/l	0.08	0.06	0.08	0.07	0.06	0.04	0.08	0.08
19.	Zinc as Zn	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20.	Lead as Pb	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21.	Arsenic as orc	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22.	Mercury as Hg	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
23.	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24.	Total Chromium	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

S. No.	Parameter	Units	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8
25.	Copper as Cu	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26.	Manganese as Mn	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27.	Selenium as Se	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28.	Cyanide as CN	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
29.	Aluminium as Al	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
30.	Boron as B	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
31.	DO	mg/l	3.2	3.0	3.0	2.7	2.8	2.5	9.4	9.7
32.	COD	mg/l	30	40	30	20	20	20	16	14
33.	BOD	mg/l	07	07	06	06	07	04	<3.0	<3.0
34.	SAR	-	0.71	0.73	0.84	0.89	0.74	0.81	0.58	0.61
35.	Coliform	MPN/250ml	1400	1800	900	1200	1500	1400	690	789
36.	E. Coli	MPN/250ml	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Table 3.28: Surface Water Quality in Pre-Monsoon-2020

S. N.	Parameter	Units	SW-1	SW-7	SW-8
1	pH at 25 °C	-	7.83	8.06	8.22
2	Color	Hazen	<01	50	60
3	Turbidity (NTU)	NTU	1.37	25.3	19.4
4	EC	µS/cm	292	275	296
5	Total Dissolve solids	mg/l	192	184	196
6	Total Hardness as $CaCO_3$	mg/l	107	70	70
7	Total Alkalinity	mg/l	85	70	70
8	Calcium as Ca	mg/l	26	19.0	20.0
9	Magnesium as Mg	mg/l	10.2	8.0	8.2
10	Sodium as Na	mg/l	19	15	14
11	Chloride as Cl	mg/l	31.6	35	35
12	Residual Free Chlorine	mg/l	<0.02	<0.02	<0.02
13	Phenolic Compounds	mg/l	<0.02	<0.02	<0.02
14	Mineral Oil	mg/l	<0.01	<0.01	<0.01
15	Sulphate as SO_4	mg/l	23.2	29	26
16	Fluorides as F^-	mg/l	0.18	0.32	0.32
17	Nitrates as NO_3	mg/l	3.4	3.8	3.8
18	Iron as Fe	mg/l	0.08	0.12	0.12
19	Zinc as Zn	mg/l	<0.001	<0.001	<0.001
20	Lead as Pb	mg/l	<0.001	<0.001	<0.001
21	Arsenic as As	mg/l	<0.001	<0.001	<0.001
22	Mercury as Hg	mg/l	<0.0001	<0.0001	<0.0001
23	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001
24	Total Chromium	mg/l	<0.001	<0.001	<0.001
25	Copper as Cu	mg/l	<0.001	<0.001	<0.001
26	Manganese as Mn	mg/l	<0.001	<0.001	<0.001
27	Selenium as Se	mg/l	<0.001	<0.001	<0.001
28	Cyanide as CN	mg/l	<0.001	<0.001	<0.001
29	Aluminium as Al	mg/l	<0.001	<0.001	<0.001
30	Boron as B	mg/l	<0.001	<0.001	<0.001
31	DO	mg/l	3.6	6.5	6.4
32	COD	mg/l	30	18	16
33	BOD	mg/l	06	<3.0	<3.0
34	SAR	-	0.80	0.73	0.67
35	Coliform	MPN/250ml	150	784	834
36	E. Coli	MPN/250ml	Not Detected	Not Detected	Not Detected

N.B. In pre-monsoon there was no surface water in other sampling location

3.8 HYDROLOGY

3.8.1 Basin Characteristics

The project area under PRLIS entirely lies in Krishna basin which has a spatial extent of 2,58,948 sq.km. Krishna basin lies in the states of Maharashtra (27%), Karnataka (44%), Telangana (20%) and Andhra Pradesh (9%). The Krishna, an east flowing perennial river, rises from the Western Ghats near Jor village of Satara district of Maharashtra at an altitude of 1337 m just north of Mahabaleshwar. The Krishna basin has a tropical climate. The climate is dominated by the southwest monsoon, which provides most of the precipitation for the basin. High flow in the rivers occurs during the months of August-November and the lean flow season is from April to May. Climate types range from per-humid through dry sub-humid in the west through semi-arid in the central and eastern parts of the basin. The south-central part of the basin is truly arid. The Krishna basin receives major part of its rainfall during the South-West monsoon period. Around 70% of the rainfall takes place during July to September. After travelling 1400 km it empties into Bay of Bengal. Its principal tributaries joining from right are the Ghatprabha, the Malprabha, the Koyna, the Varna, the Panchganga, the Dudhganga and the Tungabhadra whereas the Bhima, the Khagna, the Musi and the Munneru are principal tributaries joining the river from left. Annual rainfall of the basin varies from 604 mm to 1,045 mm and the mean annual rainfall (1985-2015) in the Krishna basin is 841 mm. Many times, basin receives high rainfall in less duration causing floods in those years. The Krishna basin has a tropical climate. The mean monthly maximum and minimum temperature is about 32.1°C and 26.5°C in the basin respectively. Temperatures in the coastal region are moderate but humidity is higher. The features of Krishna basin are presented in **Table 3.29**.

Table 3.29: Features of Krishna Basin

Krishna Basin features	
Longitude	73° 17’ to 81° 9’ E
Latitude	13° 10’ to 19° 22’ N
Length of Krishna River (Km)	1400
Catchment Area (Sq.km.)	258948
Average Water Resource Potential (MCM)	78120
Utilizable Surface Water Resource (MCM)	58000
Live Storage Capacity of Completed Projects (MCM)	50117
Live Storage Capacity of Projects Under Construction (MCM)	4287
Total Live Storage Capacity of Projects (MCM)	54404
No. of Hydrological Observation Stations (CWC)	53
No. of Flood Forecasting Stations (CWC)	9

3.8.2 Drainage of Krishna Basin In Project Area

The Krishna basin is split into 7 sub-basins namely Bhima lower sub-basin (9.28%), Bhima upper sub basin (17.58%), Krishna lower sub-basin (15.5%), Krishna middle sub-basin (8.73%), Krishna upper sub-basin (21.4%), Tungabhadra lower sub-basin (16.31%), and Tungabhadra upper sub-basin (11.2%) (Map 13), each of which represents a different tributary system.

The entire project area lies in the Krishna lower sub-basin and Krishna middle sub-basin. The drainage of the basin is dendritic to sub-dendritic. Musi and Kagna rivers, which are the main tributaries of River Krishna, originate from and drain the command area of the project. Pedda Vagu, Chinna Vagu and Pochamma Vagu are the minor tributaries of River Krishna drain the project area of PRLIS. The drainage map of Krishna basin and its seven-sub basin is shown in **Figure 3.22**.

Figure 3.22: Drainage Map of Krishna Basin

3.8.3 Hydrometeorology Studies

There are 3 main organizations in the country which records meteorological parameters viz., India Meteorological Department (IMD), Central Water Commission (CWC) and ISRO (Automatic Weather Stations). 47 meteorological stations of CWC (Central Water Commission) are located in the basin. These stations are established to understand the relationship between meteorological parameter and river dynamics. The stations carry out observations pertaining to meteorological parameters viz., Rainfall, Temperature, Pan Evaporation, Relative Humidity, Wind Speed, Sunshine etc. 312 Indian Meteorological stations (IMD) are also functional in the basin. The integrated approach of measuring meteorological parameter using automated weather stations (AWS) is helpful in the remote region. AWS stations require minimum

maintenance and the data is generated on temporal basis. Under the supervision of ISRO, 78 AWS station have been established in the basin.

The average annual mean temperature in the Krishna basin for the period of 1969 to 2004 is 26.32°C. During January, which may be taken as representative of the winter months the average mean temperature for the period of 1969-2004 in the basin is 22.39° C. During April, which may be taken as representative of the summer months the average mean temperature for the period of 1969-2004 in the basin is 29.50° C. During July, which may be taken as representative of the monsoon months the average mean temperature for the period of 1969-2004 in the basin is 26.10° C. During October, which may be taken as representative of the post-monsoon months the average mean temperature for the period of 1969-2004 in the basin is 25.78°C.

3.8.4 Rainfall Profile of Krishna Sub Basins

Like most other parts of India, the Krishna basin receives its maximum rainfall during the south-west monsoon. The monsoon winds strike the west coast of the Indian peninsula from the west and south-west and strike the Western Ghats or the Sahyadri Range, which present an almost uninterrupted barrier ranging from 610 m to 2,134 m in height. According to the India-WRIS database the average annual rainfall in the Krishna basin for the period of 1971 to 2004 is 859 mm. The south-west monsoon sets in the middle of June and withdraws by the middle of October. About 90% of annual rainfall is received during the Monsoon period, of which more than 70% occurs during July, August and September. The distribution of annual average rainfall for Krishna basin has been shown in Map 4. Western parts of the basin receive maximum rainfall. However, around 203 blocks of 30 districts (16-Karnataka, 8-Andhra Pradesh & 6-Maharashtra) falling in the basin is drought prone (Source: Drought Prone Areas Program, DPAP, MoRD, 2002). Sub-basin Wise Annual Average Rainfall (mm) (1971-2004) distribution has been given in **Table 3.30**.

Table 3.30: Rain fall in Krishna Basin (1971-2004)

Sl. No.	Year	Annual Rainfall (mm)						
		Bhima Lower Sub-basin	Bhima Upper Sub-basin	Krishna Lower Sub-basin	Krishna Middle Sub-basin	Krishna Upper Sub-basin	Tungabhadra Lower Sub-basin	Tungabhadra Upper Sub-basin
1	1971	590.77	851.79	776.74	565.46	1121.48	698.40	1122.19
2	1972	382.88	475.76	668.47	453.34	841.35	649.27	1063.96
3	1973	768.68	1050.43	865.79	712.65	1302.74	802.32	1144.93
4	1974	832.83	993.17	793.66	746.67	1500.13	852.84	1307.98
5	1975	1106.74	1158.51	1073.53	1053.69	1614.47	1125.57	1649.26
6	1976	610.03	986.65	978.79	694.47	1199.61	537.66	964.82
7	1977	746.90	979.02	875.51	734.49	1400.93	903.05	1270.93
8	1978	937.94	930.36	1248.83	999.51	1399.29	992.41	1470.15
9	1979	819.02	992.27	758.67	696.99	1257.96	786.60	1219.79
10	1980	594.62	964.12	833.11	555.36	1287.60	758.94	1434.03
11	1981	913.53	1008.03	969.54	914.37	1434.63	899.45	1197.87
12	1982	629.28	741.00	826.90	705.63	1276.48	755.74	1343.12
13	1983	839.75	1011.58	1189.37	966.44	1574.26	848.37	1272.14
14	1984	573.36	771.26	677.66	589.32	1180.41	673.99	1136.45

Sl. No.	Year	Annual Rainfall (mm)						
		Bhima Lower Sub-basin	Bhima Upper Sub-basin	Krishna Lower Sub-basin	Krishna Middle Sub-basin	Krishna Upper Sub-basin	Tungabhadra Lower Sub-basin	Tungabhadra Upper Sub-basin
15	1985	534.01	672.72	759.77	565.46	1272.74	592.14	968.48
16	1986	592.61	677.03	883.54	586.17	1053.22	677.09	1075.26
17	1987	853.00	813.78	938.16	901.77	1303.36	786.84	1046.44
18	1988	948.81	1096.72	1165.79	870.21	1479.44	863.64	1432.51
19	1989	832.51	929.20	1112.33	789.10	1184.75	736.84	1098.31
20	1990	821.72	1095.68	1243.15	918.20	1422.79	828.93	1357.02
21	1991	663.25	870.54	978.56	750.35	1279.00	908.30	1395.63
22	1992	573.86	751.40	759.28	634.93	1289.66	835.45	1415.52
23	1993	723.44	1033.66	840.65	716.09	1555.27	864.03	1235.32
24	1994	507.09	965.80	889.57	655.64	1275.21	843.43	1424.98
25	1995	730.19	800.76	1148.92	955.31	1374.96	871.57	1306.72
26	1996	825.16	1005.41	1109.74	913.30	1413.62	977.75	1319.06
27	1997	593.89	882.31	910.03	712.01	1373.16	776.35	1253.82
28	1998	1050.93	1207.92	592.24	1065.46	1510.67	1060.06	1453.83
29	1999	649.93	903.20	833.89	561.80	1335.22	844.32	1439.25
30	2000	746.24	803.50	1070.17	833.99	1152.90	907.95	1360.13
31	2001	685.87	833.98	949.51	867.09	1035.08	809.42	1054.23
32	2002	586.44	661.95	678.33	627.17	919.87	625.77	1051.92
33	2003	506.13	582.15	915.09	644.35	921.14	577.27	1048.15
34	2004	627.84	932.40	819.00	636.37	1363.12	625.68	1176.09
Average		717.63	895.12	915.71	752.74	1291.37	802.87	1250.30

3.8.5 Water Availability

3.8.5.1 Provisions under Krishna Water Disputes Tribunal and National Water Policy

The Krishna and its tributaries are an inter-state river system flowing through the states of Maharashtra, Karnataka, Telangana and Andhra Pradesh. The Krishna Water Dispute Tribunal (KWDT-1), headed by Justice R.S. Bachawat, was constituted in April 1969 for adjudication of inter-state water disputes regarding the sharing of Krishna waters. The KWDT-I gave its final award in 1976. As per this award, 75% dependable flow of the Krishna water at Vijayawada was assessed as 2060 TMC (58,339 Mm3). The KWDT-1 made allocation of Krishna water among the state of Maharashtra, Karnataka and erstwhile Andhra Pradesh as 560TMC (15,859MCM); 700 TMC (19,824 MCM) and 800 TMC (22,656MCM) respectively under Scheme-A. In addition to above the state of Maharashtra, Karnataka and Andhra Pradesh were allowed share of regeneration to the tune of 25 TMC, 34 TMC and 11 TMC respectively. The total allocations amongst states are shown in **Table 3.31.**

Table 3.31: Water Resources Allocations of Krishna Basin

State	Allotment (TMC)	Share out of return flows (TMC)	Total (TMC)
Maharashtra	560	25	585
Karnataka	700	34	734

State	Allotment (TMC)	Share out of return flows (TMC)	Total (TMC)
Andhra Pradesh	800	11	811
Total	**2060**	**70**	**2130**

The allocations made to the States were *en-bloc* (mass allocation) subject to certain restrictions laid in Clause-IX & Clause-X of final order of the Tribunal.

As deficit sharing is not provided in Scheme-A of allocation, the lowest riparian State i.e., erstwhile Andhra Pradesh would be suffering more than other States in 25% of deficit years. Therefore, KWDT-I had permitted erstwhile AP to use all the remaining waters available in Krishna basin in 75% of years and also permitted to build carry over storages at Srisailam and Nagarjuna Sagar to the extent feasible and utilize the so impounded water in any manner it deems proper.

The KWDT-I provided that the award may be reviewed at any time after 31st May, 2000. KWDT-I in its report noted that in the changed circumstances like population, engineering, economic, irrigation and other conditions constantly change and new demands for water continually arise. The relevant observations made by KWDT-I and KWDT-II are as follows:

a) KWDT-I Observations

KWDT-I observed in its report that after a reasonable time

"There will be increasing demands for water for irrigation and other purposes, in the Krishna basin which may have to be examined in the light of the fresh data that may be available. It may be mentioned that the demands of the three States will by that time take much more realistic shape. Further in view of the stupendous advance in the technology in the matter of conservation of water and its-uses and also for other reasons it may become necessary to examine the subject of apportionment of water after the 31st May, 2000" (Page No.159 of KWDT-I).

While allowing claims of existing uses before claims of future uses, KWDT-I clarified that

"It is not intended that the existing uses must continue or that they should not be changed in future". (KWDT-I Report page-98 RHS of, 1st Para).

KWDT-I also stipulated that in allocation for future uses more weightage should be given to the in-basin uses. (Page No.128 of KWDT-I& Page 207 of NCIWRD Report, 1999)

b) National Water Policy, 2012 & IWRDM Guidelines, 2016

National Water Policy, 2012 states "Integrated Water Resources Management (IWRM) taking river basin/sub-basin as a unit should be the main principle for planning, development and management of water resources".

The Guidelines for Integrated Water Resources Development and Management by Ministry of Water Resources, RD & GR, Government of India states that "The approach to inter basin

transfer is that optimal-utilisation of land and water should first be aimed at, in basins with possible surpluses. After meeting such essential requirements, if there is surplus water available in the basin, its transfer to other basins may be considered. "

c) KWDT-II Observations:

"Increase in population and the new kind of projects coming up for providing employment to the people of the area, exodus to the cities, changes in economic conditions, change in local needs all of them materially affect the needs of the people of the basin and sub basins affecting equitable considerations."(Pg.185 of KWDT-II)

"Availability of carryover storages or new storages constructed later may necessitate a re-look of the equitable distribution made earlier and with increased needs, more and fuller utilization of water may become necessary leading to make changes in the dependability factor also. It may also minimize flows to the sea. In such circumstances as indicated above, need of each riparian States may perhaps have to be re-assessed and depending upon the availability of water some readjustment, reallocation or further allocation of share of water may have to be made."(Pg.185 of KWDT-II)

"Human activities do not remain static. The equitable factors may change, changing inter se comparative needs and preferences of uses of water. In some cases, as in the case in hand as well, more modern methods have become available for gauging of the flows and new sites also. It may also make a difference. Then necessity of more projects may be felt for making water available to the drought prone area which had not been possible earlier. Therefore, possibility of significant and material changes in the factors which play an important role in equitable distribution of waters of riparian States is not ruled out rather it is imminent. The doctrine of 'flexibility' cannot be ignored. However, equitable sharing once made may cease to be equitable in the face of new circumstances. In such circumstances it was well in its wisdom that KWDT-1 had considered and envisaged such changes, and made a provision for review after May 31, 2000. It will not be appropriate to apply straight jacket formula of finality of decisions in perpetuity relating to a Inter State Water Disputes." [pg. 185&186 of KWDT-II]

d) Helsinki Rules,1966 and UNWC Convention, 1997

The international law stressed upon equitable and reasonable utilization to be considered while allocating international river waters. International law experts expressed that riparian can be affected, or even harmed, by the foreclosure of their future uses of water, caused by the prior use, and the claiming of rights to such water by the downstream riparian. Telangana being a late developer due to various political reasons its rightful share of Krishna River waters shall not be denied perpetually by the early developers in the basin. Hence, as per the natural justice and on the basis of equitable and reasonable utilisations, Telangana is entitled for a fair and rightful share of water for its chronically drought affected and severely fluoride affected in basin needs in Krishna waters, otherwise it would suffer in perpetuity.

3.8.6 Case of Telangana for Surplus Water-Based Projects

Based on the liberty granted by KWDT-I, erstwhile Government of Andhra Pradesh has taken up several projects like AMR SLBC, Kalwakurthy LIS, Nettempadu LIS, PR LIS and Dindi LIS to utilize surplus waters (at lesser dependability than 75%) of river Krishna in Telangana region.

KWDT-II in its decision retained the liberty to use surplus waters to erstwhile AP. It allocated 150 TMC of carryover storage to e/w Andhra Pradesh out of 65% dependability and average flows. The water of river Krishna are allocated to the riparian States on *en-block* (mass allocation) basis out of 75% dependable flows, by the KWDT-I and later at 65% and average dependability by the KWDT-II. However, the decision of KWDT-II is not attained finality as its publication was stayed by Hon'ble Supreme Court.

Subsequent to Andhra Pradesh Re-organization in 2014, the term of KWDT-II was extended to make project-wise specific allocations and to make operation protocol during deficit flows vide Section-89 of APRA, as there is no region wise or project wise allocations for Telangana and Andhra Pradesh, made by either KWDT-I or KWDT-II. Telangana is pleading before KWDT-II under Section-89 proceedings, for allocation of Krishna waters out of 75% dependable flows to the projects namely Srisailam Left Bank Canal (SLBC) – 40 TMC, Mahatma Gandhi Kalwakurthy Lift Irrigation Scheme (MGKLIS)-40 TMC, Jawahar Nettempadu Lift Irrigation Scheme (JNLIS)-25.4 TMC, Palamuru-Rangareddy LIS-90 TMC and Dindi Lift Irrigation Scheme-30 TMC, thus totalling to 225.40 TMC. All these projects of Telangana serve severe drought prone and fluoride affected areas entirely lying within Krishna Basin which are starving for assured waters of river Krishna for several decades. Telangana is pleading to make a fair and equitable share of Krishna River waters based on relevant basin parameters, which weigh about two thirds in favour of Telangana, out of the *en bloc* allocation of 1005 TMC made to erstwhile Andhra Pradesh by KWDT-II (811 at 75% dependability + 49 TMC at 65% dependability + 145 TMC at average dependability). Telangana pleaded that sufficient water is available for considering allocation to the projects of Telangana out of 75% dependable flows. The KWDT-II is examining and assessing the realistic crop water requirements of these projects on scientific basis between two states.

a) Water Available for Utilization

The project is planned by the combined State of Andhra Pradesh under the liberty granted by KWDT-I to utilize the surplus waters of river Krishna available at Srisailam reservoir.

Under section-89 proceedings Telangana is pleading before KWDT-II to curtail the substantial diversions of Andhra Pradesh to outside basin area and luxury in usage of water under existing projects and to allocate water to in basin projects of Telangana.

b) Palamuru Rangareddy LIS

The project was commenced much before the formation of Telangana. CMO vide its endorsement dt.04.02.2009 directed department to investigate to take up PRLIS. The project was originally sanctioned for Rs. 6 crores for preparation of DPR to irrigate 10 lakh acres with 70 TMC of water vide G.O.Ms.No. 72, dt. 08.08.2013. The scheme was intentionally put in protracted correspondence to delay the project. Based on the Survey and investigation undertaken pursuant to the administrative approval issued by erstwhile State of Andhra

Pradesh, a conclusion arrived in review that the drawl of sufficient quantity of water for PR LIS from the Jurala barrage will not be possible in view of its meagre storage. Accordingly, a decision was taken to change the source of drawl of water from Jurala to Srisailam. This project was taken up by erstwhile Andhra Pradesh under the liberty granted to it by KWDT-I in remaining waters.

Further, Hon'ble Prime Minister Sri Narendra Modi in his election campaign during 2014 general elections assured to complete the project. All the political parties in Telangana also assured to complete this project in their manifestos.

Government have examined matter in detail and observed that there is substantial saving in utilisation in minor irrigation of Telangana in Krishna basin. A quantity of 90.81 TMC was protected as existing utilisation by KWDT-I in Telangana based on the decadal average utilisation for the period 1951-52 to 1960-61. However, based on the latest decadal average utilization i.e, 2012-13 to 2021-2022, which is the basis for assessment as directed by KWDT-I, the utilization of Telangana is 45.15 TMC, resulting in saving of 45.66 TMC (90.81-45.15). The details are shown at **Table 3.32**.

Table 3.32: Minor Irrigation Water Utilisation in Krishna Basin of Telangana

S. No	Year	Area Irrigated (Acres)			Water Utilization (TMC)		
		1st Crop	2nd Crop	Total	1st Crop	2nd Crop	Total
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1	2012-13	192,797	34,325	227,122	28.905	8.581	37.486
2	2013-14	294,735	79,730	374,465	44.188	19.932	64.121
3	2014-15	174,004	55,561	229,565	26.088	13.890	39.978
4	2015-16	147,529	47,157	194,686	22.118	11.789	33.907
5	2016-17	206,754	60,718	267,472	30.998	15.179	46.177
6	2017-18	188,969	57,481	246,449	28.331	14.370	42.701
7	2018-19	161,303	39,032	200,335	24.183	9.758	33.941
8	2019-20	195,098	59,644	254,742	29.250	14.911	44.161
9	2020-21	255,461	61,172	316,634	38.300	15.293	53.593
10	2021-22	263,800	63,706	327,506	39.550	15.926	55.477
Decadal Average (2012-13 to 2021-22)		**208,045**	**55,853**	**263,898**	**31.19**	**13.96**	**45.15**

Further, as per the interstate agreement dated 04.08.1978 which is part of GWDT Award, erstwhile Andhra Pradesh agreed to divert 80 TMC at 75% dependability of Godavari waters from Polavaram project to Krishna River upstream of Vijayawada anicut thereby displace in the discharges from Nagarjunasagar project for Krishna Delta, thus enabling use of said 80 TMC for the projects upstream of Nagarjunasagar project. Out of this 80 TMC, 35 TMC was earmarked to Maharashtra and Karnataka. In fact, the states of Maharashtra and Karnataka have taken up projects on the basis of above stated 35 TMC. It is pertinent to mention that, the upper states of Maharashtra and Karnataka pleaded before KWDT-I that as far as Krishna River is concerned the

available supplies are hardly sufficient even to meet the needs of three states within Krishna basin and Andhra Pradesh is diverting large quantities of Krishna waters to outside basin without any concern to needs of other basin states. Upper states have pleaded before KWDT-I for a direction to Andhra Pradesh to divert water from Godavari to Krishna. All the utilisations in ongoing projects of Telangana upstream of Nagarjunasagar project are serving within the basin whereas all the utilisations in ongoing projects of Andhra Pradesh are outside Krishna basin. The Polavaram project was cleared by CWC in its 95th TAC held in 2009 for an FRL of 150 ft. Therefore, Telangana is entitled for utilisation of balance 45 TMC out of 75% dependable flows upstream of Nagarjunasagar project. Government of Telangana vide its G.O. Rt. No. 246 Dt: 18.08.2022 has accorded approval for utilisation of 90 TMC towards Palamuru Rangareddy LIS in view of availability of water at 75% dependability as stated above. Copies of 04.08.1978 agreement of GWDT, TAC clearance to Polavaram Project, G.O. of Water Allocation and Minor Irrigation Ayacut details and Utilisations in Telangana for the period from 1951-52 to 1960-61 as per (MRDK-VIII) in KWDT-I are attached herewith as **Annexure XI.**

3.8.7 Water availability analysis at Srisailam (Yeller village)

The Central Water Commission assessed 10-daily inflow series from 1984-85 to 2020-21 at Srisailam Reservoir. Based on the series, the water available at 75% dependability is worked out as about 16,494 MCM (582.5 TMC). Out of this water after meeting the needs of 280 TMC towards Nagarjunasagar project, 16.5 TMC towards Hyderabad Water Supply, 15 TMC towards Chennai Water Supply, 22 TMC towards evaporation losses in Srisailam Reservoir and 19 TMC towards SRBC, a quantity of 230 TMC is available at Srisailam Reservoir at 75% dependability. As such enough water is available to meet the requirement of Palamuru Ranga Reddy LIS to an extent of 90 TMC as well as meeting requirements of SLBC (40 TMC), Kalwakurthy (40 TMC) and Dindi LIS (30 TMC).

Table 3.33: Statement Showing Monthly Inflow Series at Srisailam Reservoir

S.N.	Year	Inflow at Srisailam Reservoir (TMC)												Total	Decending Order
		June	July	August	September	October	November	December	January	February	March	April	May		
1	1984-85	24.2	376.3	320.5	109.2	165.6	15.6	7.6	7.7	6.3	6.9	6.4	6.2	1052.5	1978.6
2	1985-86	29.8	174.0	329.6	34.1	98.6	5.7	5.2	7.4	5.1	4.0	3.5	3.8	700.7	1873.9
3	1986-87	55.0	163.8	328.9	55.0	25.4	26.8	5.0	5.2	3.9	3.9	3.1	3.1	679.2	1789.1
4	1987-88	31.4	156.3	175.5	65.0	112.7	36.6	11.2	6.2	4.7	4.3	4.1	3.4	611.5	1695.0
5	1988-89	7.1	231.9	453.9	426.6	155.3	9.3	8.9	7.3	5.9	6.5	5.7	4.0	1322.4	1684.3
6	1989-90	3.3	210.9	259.4	261.4	168.4	13.0	8.6	7.7	5.5	5.2	4.3	21.5	969.2	1671.4
7	1990-91	86.0	307.9	646.4	188.9	184.1	49.4	11.4	7.6	6.0	6.0	5.3	5.4	1504.6	1608.3
8	1991-92	221.2	442.1	680.7	122.8	68.9	19.7	9.6	9.5	8.8	8.6	8.5	8.0	1608.3	1571.5
9	1992-93	13.4	108.6	386.7	122.6	51.6	157.2	12.1	8.4	7.1	6.8	4.8	2.8	882.1	1504.6
10	1993-94	19.5	192.3	376.4	229.0	407.5	37.6	26.9	9.6	7.6	8.0	9.6	8.8	1332.8	1332.8
11	1994-95	51.7	890.5	365.7	426.2	167.3	29.0	9.6	11.0	7.6	8.0	8.4	3.7	1978.6	1322.4
12	1995-96	6.9	122.2	106.4	142.1	158.0	14.6	7.6	6.1	6.0	5.0	3.9	3.7	582.5	1188.8
13	1996-97	28.0	94.5	258.4	239.9	381.5	42.2	9.1	6.6	5.4	5.3	3.9	4.9	1079.7	1183.0
14	1997-98	12.6	166.5	719.0	155.4	46.0	39.0	16.7	7.1	6.3	6.3	4.8	3.3	1183.0	1079.7
15	1998-99	19.7	144.0	241.9	368.2	700.8	67.5	10.1	1.7	1.8	0.3	5.5	10.0	1571.5	1052.5
16	1999-00	26.3	285.4	280.5	49.1	179.3	17.1	2.1	2.3	2.0	0.4	0.4	3.3	848.2	981.5
17	2000-01	22.4	124.7	100.7	134.5	162.6	9.6	5.8	3.5	3.7	3.2	105.3	138.2	814.2	969.2
18	2001-02	3.5	28.2	114.4	109.4	220.6	6.6	7.1	5.9	3.5	1.2	0.0	2.7	503.0	882.1
19	2002-03	0.5	0.5	101.2	13.2	48.6	3.7	7.0	8.4	7.1	7.1	3.9	2.8	203.9	861.1
20	2003-04	1.3	1.2	41.6	33.2	24.0	1.3	5.4	4.0	4.9	2.1	1.4	9.1	129.5	848.2

21	2004-05	6.7	4.1	343.9	45.4	72.0	2.8	5.1	2.2	1.7	0.0	0.0	0.7	484.5	814.2
22	2005-06	1.5	164.4	977.5	355.9	150.0	18.2	5.6	4.4	1.4	4.4	0.9	0.0	1684.3	733.9
23	2006-07	10.0	288.3	1064.4	158.9	101.1	25.8	5.6	4.8	3.9	2.8	4.0	1.7	1671.4	700.7
24	2007-08	88.6	401.7	505.0	521.3	105.5	12.5	5.3	2.4	6.3	38.7	6.5	1.2	1695.0	679.2
25	2008-09	1.4	0.0	325.5	210.7	51.9	14.6	7.9	3.7	2.6	0.6	0.0	0.7	619.6	643.8
26	2009-10	12.4	84.1	106.1	224.7	685.9	42.2	17.4	10.5	2.9	0.0	0.0	2.8	1188.8	619.6
27	2010-11	4.4	64.5	340.2	256.8	199.1	95.0	15.6	2.7	1.7	1.5	0.0	0.0	981.5	611.5
28	2011-12	6.7	115.1	199.1	394.4	7.9	4.3	3.2	2.1	1.1	0.0	0.0	0.0	733.9	582.5
29	2012-13	2.0	2.7	51.7	119.5	50.9	22.5	6.9	5.2	3.6	0.5	0.4	0.6	266.4	580.8
30	2013-14	6.5	246.5	323.1	193.2	53.8	16.8	7.8	4.5	3.9	3.1	0.9	0.9	861.1	503.0
31	2014-15	1.9	5.6	335.4	253.4	21.2	8.2	4.1	2.3	2.4	1.7	5.8	1.6	643.8	484.5
32	2015-16	1.3	0.5	0.8	44.8	16.5	4.4	2.6	0.5	0.8	0.6	0.9	0.6	74.2	479.2
33	2016-17	2.4	22.8	171.4	107.6	37.4	0.6	0.0	0.8	0.3	0.8	1.2	0.7	345.9	345.9
34	2017-18	1.5	4.8	4.7	192.6	245.3	10.9	12.6	1.4	0.5	3.4	1.1	0.5	479.2	266.4
35	2018-19	0.3	145.3	329.3	56.1	22.7	11.2	6.9	7.5	0.1	0.2	1.1	0.2	580.8	203.9
36	2019-20	0.2	3.6	889.3	440.3	436.5	67.7	16.1	15.3	2.8	0.8	1.1	0.3	1873.9	129.5
37	2020-21	1.3	104.0	457.6	551.7	626.4	40.3	3.3	0.1	0.1	0.8	2.1	1.5	1789.1	74.2

Source: Prepared by Central Water Commission, GoI, December, 2021 communicated by KRMB vide its letter dated 02.02.20

3.8.8 Availability and Existing Requirement at Srisailam Reservoir

It is proposed to lift 90 TMC of water to this scheme from Srisailam reservoir. The pumping is proposed during monsoon period from July to October. Therefore, there will not be any appreciable quantitative changes in the river flows due to pumping. Since there is no reservoir proposed on the main Krishna River, there is no change in the water surface and as such there is no consequent increase in evaporation losses.

Therefore, the required quantity of 90 TMC to the PRLIS is available even after meeting existing and ongoing requirements as stated above. The State of Telangana keeping in view of the hardships of in-basin chronic drought prone areas of erstwhile Mahabubnagar district into consideration would like to harness this water to the benefit of people.

3.8.9 Design Flood

No new structures are planned across the River Krishna under the Project. Therefore, no need for assessing design floods for planning construction and subsequent diversion arrangement with reference to River Krishna. The catchments of proposed balancing reservoirs are very small and computed floods in these reservoirs are not significant. Further, these reservoirs are planned to be constructed mainly during non-monsoon days no elaborate diversion arrangements will be necessary. However, in case of any contingency temporary diversion arrangements will be made.

3.8.10 Sedimentation

PRLIS is a lift irrigation scheme with Srisailam Reservoir as source for pumping of water. Sediment observations and analysis on Krishna River are being conducted at several stations up stream of Srisailam Reservoir. The sedimentation studies carried out for Srisailam reservoir on regular basis. The storage reservoirs viz., Anjangiri, Veeranjaneya, Venkatadri, Udandapur, Kurumurthyraya and KP Laxmi devipally are intended to store waters pumped from Srisailam reservoir from July to October. The water is proposed to be pumped from foreshore of Srisailam

reservoir, which is expected to contain comparatively very less sediment. Therefore, no sedimentation is anticipated in to the balancing reservoirs proposed under the project

3.8.11 Catastrophic Events like Cloud Burst and Flash Floods

As per available records no incidence of flash flood due to cloud burst or incessant rains from worst storm has been witnessed in sub-basin. The study of rainfall data of the rain gauges in the catchment manifest that there has not been any disastrous flood in the river. As per state disaster management plan the district is not flood prone at all.

3.8.12 Environmental Flows

PRLIS is a lift irrigation scheme with Srisailam Reservoir on Krishna River as source for pumping of water. Therefore, whatever environmental flows have to be released that shall be from the reservoir of Srisailam project. No new tapping of rivers is conceived in PRLIS Phase-II works as the project activities shall involve construction of main canal, branches and distribution system, the case for release of environmental flow from canals does not arise.

3.8.13 Hydrogeology

Geological mapping and geomorphological analysis of the command area reveals that:

i) most of the project area is occupied by Peninsular Gneissic Complex (PGC);
ii) PGC is intruded into at places by Younger Intrusive (apatite and fine grained quartzo-feldspathicveins and pegmatite, quartz veinsandreefs);
iii) a thin section of sedimentary rocks (sandstone, shale and limestone) belonging to Cuddapah Super Group (CSG) overlie the PGC, consisting of quartzite, shale, sandstones and limestone, occurring in southern part;
iv) Deccan Traps (DT), lava flows of basaltic composition, inter-trappean (conglomerates, chertandsandstone), infra-trappeanbeds (conglomerate, grit, sandstone, marlandchert) and red boleoccuroverthe rocks of PG CaroundKodangal, Shadnagar, Pargiand Vikarabad; and
v) Laterite occur as cap rock on basalts in the Northern part of the project area as caprock.

From hydro-geologic point of view, the area can be studied under 3 heads viz., i) Archean Crystallines; ii) Proterozoic; and iii) Deccan Traps. **Table 3.34** gives distribution of different types of litho-units in each of the district constituting part of PRLIS.

Table 3.34: District-Wise Distribution of Litho-Units in PRLIS Area

SN	District	Area (km2)				%
		Archean	Cuddapah	Deccan Trap	Total	
1	Mahbubnagar	2,971.27	115.71	-	3,086.98	34.92
2	Nagarkurnool	698.56	-	-	698.56	7.90
3	Nalgonda	240.43	-	-	240.43	2.72
4	Rangareddy	2,015.35	-	276.61	2,291.96	25.93

SN	District	Area (km2)				%
5	Vikarabad	1,477.15	52.00	992.37	2,521.52	28.53
	Total	**7,402.76**	**167.71**	**1,268.98**	**8,839.45**	100.00
	%	**83.75**	**1.90**	**14.36**	**100.00**	

Archean Crystalline

The Archean crystalline rocks are represented by pink and grey granites and gneisses. The occurrence of ground water is controlled by the depth and degree of weathering and fracturing. The thickness of weathering of these rocks' ranges from 10 to 30 m.

Groundwater occurs under water table conditions in weathered mantle and semi-confined to confined conditions in the fractured and jointed rocks. The depth of dug wells in weathered zone varies from 6 to 20 m with 2 to 3 m column of water retained during summer months. The aquifers in pink granite are more potential than those in grey granites.

For irrigation purpose, the shallow aquifer system is generally tapped by the dug wells down to the depth of 12 to 20 m and dug-cum-bore wells down to the depth of 40 m. The deeper aquifers are developed by constructing bore wells generally down to depth of 100 m. However, beyond the depth of 80 m, potential zones are rare except along lineament and valleys.

Cuddapah formations

The formations are represented by quartzite, shale, sandstone and limestone and occur in southern part of the district around Srishailam, Kollapur and Alampur. Shales are less permeable. Sandstone and limestone yield copious amount of water.

Groundwater in CSG occurs under unconfined to semi-confined conditions, sometimes even confined conditions. While quartzite is known to be impervious in nature owing to its massive texture, shales are reported to be very poor aquifers due to its clayey texture. Sandstones and Limestone are good aquifers owing to their texture and mineral composition. Limestone could yield copious amount of water where it is cavernous. Groundwater in this shallow aquifer is harnessed through dug-wells, usually ranging between 5 and 30 m bgl. Average well yields from dug wells tapping shallow aquifers in CSG are reported to range 170-250 cum/d. Semi-confined conditions are seen where there is a layer of fractured or jointed rock of reasonable thickness, generally reported between 45 to 60 m bgl. These medium level semi-confined aquifers are exploited through bore wells, usually drilled up to around 100 m bgl. Average well yields from bore wells tapping deeper aquifers in PGC are reported in the range of 3-5 lps. Confined conditions are limited to areas where bore wells encounter cavernous limestone, sometimes resulting in a flowing well.

Deccan Traps

The Deccan trap formations are represented by vesicular-amygdaloidal and massive basalt. These formations are not favourable for shallow aquifers. However, contact zones with the underlying lime stone, shale and granite are favourable for deep bore wells.

The trap area is poor in groundwater and most of the wells in this terrain, especially in Pargi and Vikarabad, draw water either from the contact of two basaltic flows or from the underlying granite. The wells in laterite yield good quantity of groundwater round the year.

Groundwater in DT generally occurs under water table conditions, well yields are controlled by thickness of the weathered zone, which range between 5-10 m. Groundwater in this shallow aquifer is harnessed through dug-wells, usually ranging between 6 to 12 m bgl. Owing to massive or vesicular-amydoloidal textures of basalts here, well yields from dug wells extremely poor, mostly dry during larger part of the year. Semi-confined conditions are seen where there is a contact zone with underlying limestone, shale or granite. These medium level semi-confined aquifers are exploited through bore wells, usually drilled up to around 100 m bgl. Deep bore wells (about 200 m bgl) are known to tap basalt-red bole/infratrappean/intertrappean-basalt, occurring in confined condition, usually with good yields.

a) Aquifer Characteristics

The Central Ground Water Board (CGWB) has constructed 8 piezometers down to the depth of 30 m bgl, and 129 deep exploratory wells down to the depth of 200 min different types of litho-units encountered in the district.

Based on the outcome of these explorations, CGWB observed that:

i) thickness of the weathered mantle ranges 1-25mbgl;
ii) majority of the aquifer zones are encountered at depth range of 15-25 mbgl;
iii) these shallow aquifer zones occur
iv) under unconfined conditions;
v) the shallow aquifer system is tapped by through dugwells,12–20 m bgl, and dug-cum-bore wells of about 40m depth bgl;
vi) yields of dug wells range between 180 and 250m^3/day, while the discharge of the shallow bore wells is estimated at 3-4lps; and
vii) while transmissivity values of dug wells are computed at 15-50m^2/day, the range for shallow bore wells was 20-40m^2/day.

CGWB also observed that:

i) the fractures in the country rocks are of vertical to sub-vertical and sometimes horizontal;
ii) about 80% of major aquifer zones are encountered at 25-70mbgl; in 15 percent of cases, fracture zones are encountered at 70-150mbgl;
iii) except on major line aments and deep valleys, aquifer zones are very rare, beyond a depth of 150 m bgl;
iv) average well discharge in deep aquifers is 3-5 lps;
v) transmissivity is estimated at 20-50sqm/d;
vi) Specific capacity is found to be 15-30lpm/m/dd;
vii) Storage coefficient values ranged between 3.0x10 to 5.0x10-6.

b) Depth to ground water table and seasonal fluctuations

Water levels recorded in the 42 observation wells supervised by the Central Ground Water Board (Government of India), for the period 2010-2014, were used in the water level analysis of PRLIS command. It is found that: i) 36 observation wells fall in the area underlain by Peninsular Gneissic Complex (PGC), represented by Granodiorite-Adamellite; ii) 4 observation wells (Marpalli, Peddemul, Shahbad, and Shankarpalle) are in Basalt; iii) 2 observation wells, located at Mominpet and Vikarabad are in Laterite; iv) the observation well located at Tandur is underlain by Sandstone; and v) the well at Kodangal is in Limestone. Based on continuity of data and representation of geological formation, eight observation wells are considered in the study for water level analysis: i) Shankarpalle for Basalt; ii) Vikarabad for Laterite; iii) Kodangal for Limestone; iv) Tandur for Sandstone; and v) Kosigi, Bomraspet, Doultabad, and Ganded for PGC.

Pre-monsoon water levels

Figure 3.23 shows the results of pre-monsoon water level trend analysis in different geological formations of PRLIS command. It can observed that: i) in general, deepest pre-monsoon water levels are recorded in 2012-13; ii) water levels, in basalt, ranged between 10-17 meters below ground level (mbgl); iii) water levels, in laterite, ranged between 15-24 mbgl; iv) water levels, in limestone, ranged between 7-11 mbgl; v) water levels, in sandstone, ranged between 7-9 mbgl; vi) wells in PGC showed a variety of water level ranges viz., 3-5 mbgl at Kosigi, 5-12 mbgl at Bomraspet, 7-11 mbgl at Doultabad, and 8-19 at Ganded; vii) insignificant upward trend in basalt; vii) upward trend in laterite; viii) downward trend in limestone and sandstone; ix) downward trend in PGC, except at Ganded; and x) observation well in PGC at Ganded showed significant upward trend.

Post-monsoon water level trend

Figure 3.24 shows the results of post-monsoon water level trend analysis in different geological formations of PRLIS command. It can observed that: i) in general, deepest pre-monsoon water levels are recorded in 2011-12; ii) water levels, in basalt, ranged between 2-13 meters mbgl; iii) water levels, in laterite, ranged between 4-13 mbgl; iv) water levels, in limestone, ranged between 2-10 mbgl; v) water levels, in sandstone, ranged between 1.5-5.5 mbgl; vi) wells in PGC showed a variety of water level ranges viz., 3.5-5.5 mbgl at Kosigi, 5-11 mbgl at Bomraspet, 7-11 mbgl at Doultabad, and 9-19 at Ganded; vii) clear downward trend in basalt; vii) clear upward trend in laterite; viii) downward trend in limestone and sandstone; and ix) clear downward trend in PGC, including Ganded (which showed an upward pre-monsoon water level trend).

Figure 3.23: Pre-monsoon water levels in PRLIS area

Figure 3.24: post-monsoon water levels in PRLIS area

c) Water table contours

Water level contour maps, for pre-monsoon season (March) post-monsoon season (November) were generated using SURFER program. **Figure 3.25** shows pre-monsoon water level contours maps thus generated. It is observed that: i) deepest (about 23 m bgl) pre-monsoon water levels are recorded in south-eastern corner of the project area; ii) shallowest (about 6 m bgl) pre-monsoon water levels are recorded in the extreme south-central part of the project area; and iii) in general, pre-monsoon water levels are shallower (6-16 m bgl) in the western half than the eastern half (17-23 m bgl) of the project area.

Figure 3.26 shows post monsoon water level contours maps thus generated. It is observed that: i) deepest (about 23 m bgl) post-monsoon water levels are recorded in south-eastern part of the project area, east of the proposed Venkatadri Balancing Reservoir; ii) shallowest (about 3 m bgl) post-monsoon water levels are recorded in the extreme south-central part of the project area; and iii) in general, post-monsoon water levels are shallower (3-13 m bgl) in the western half than the eastern half (14-23 m bgl) of the project area.

d) Long term water trends

CGWB carried out water level trend analysis based on their long-term (30 years) water level data collected the area. It is revealed that: i) 37 percent of the wells (mainly in Amrabad area) show a "pre-monsoon water level fall" of 0.0125 m/y to 0.41 m/y; ii) a "post-monsoon water level fall" of 0.1 m/y to 0.72 m/y is observed in 35 percent of the wells; iii) totally, 72 percent of the well show a general "falling trend"; and iv) the "rising trend" is observed in the remaining 28 percent of the wells for which long term data was available.

e) Ground water Resources.

Based on the Ground Water Estimation Committee (GEC 97) norms, ground water assessment for erstwhile Rangareddy district was done in 2008-09. The mandal-wise categorization of Ranga Reddy district is presented in the **Table-3.35**. The total ground water resources available in the district are 62,199 hams. The ground water annual draft is 46,136 ham and the balance ground water resource available for irrigation being 17195 ha m. The overall stage of ground water development in the district is 74%, and falls under safe category. Based on the ground water resource estimation, 1 mandal has been classified as Over-Exploited (OE), 4 mandals as Semi Critical and rest of mandals as Safe. The Mandal wise categorization in respect of ground water development is presented in the **Figure 3.27.**

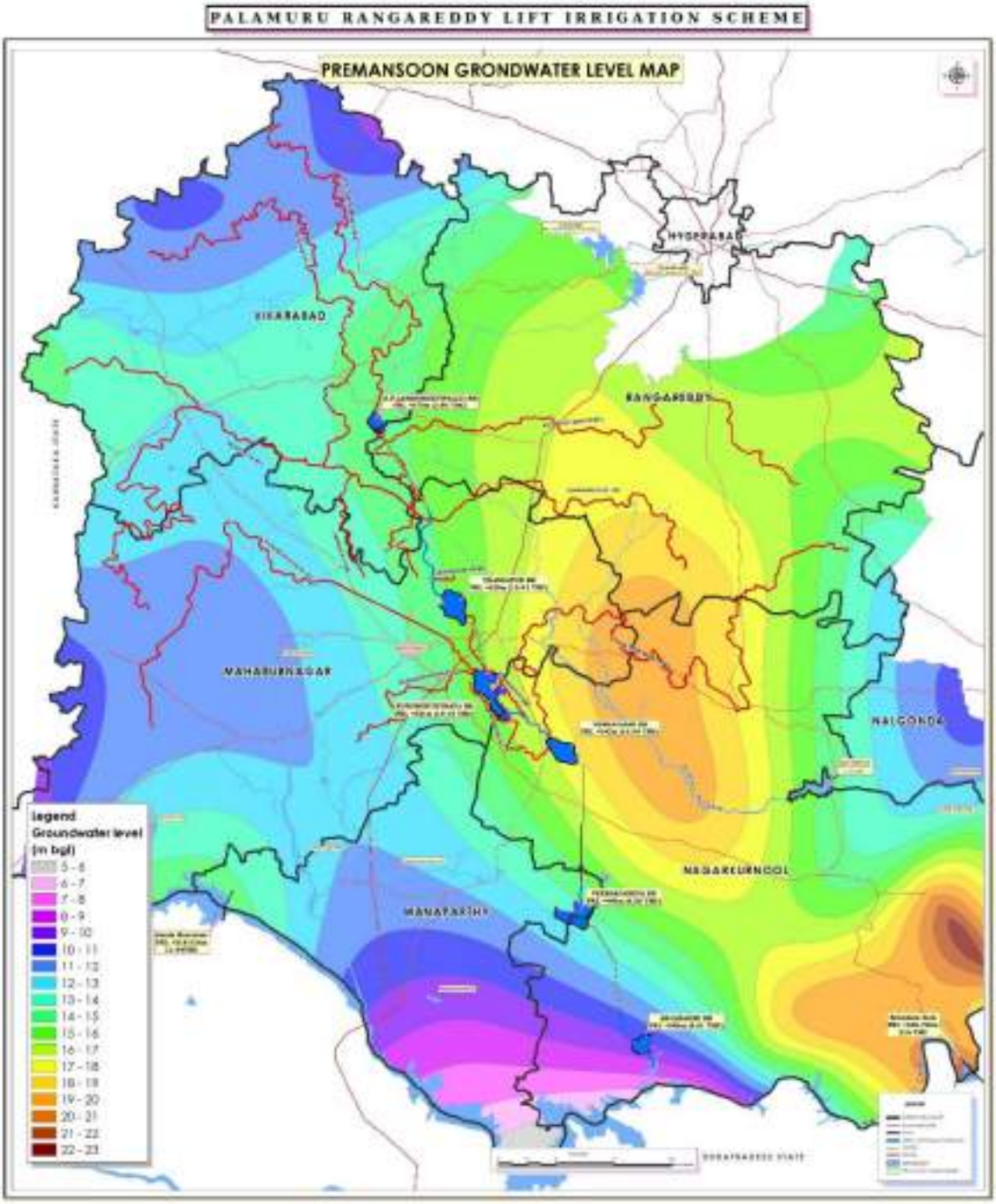


Figure 3.25: Water level contour map of PRLIS area (Pre-monsoon)

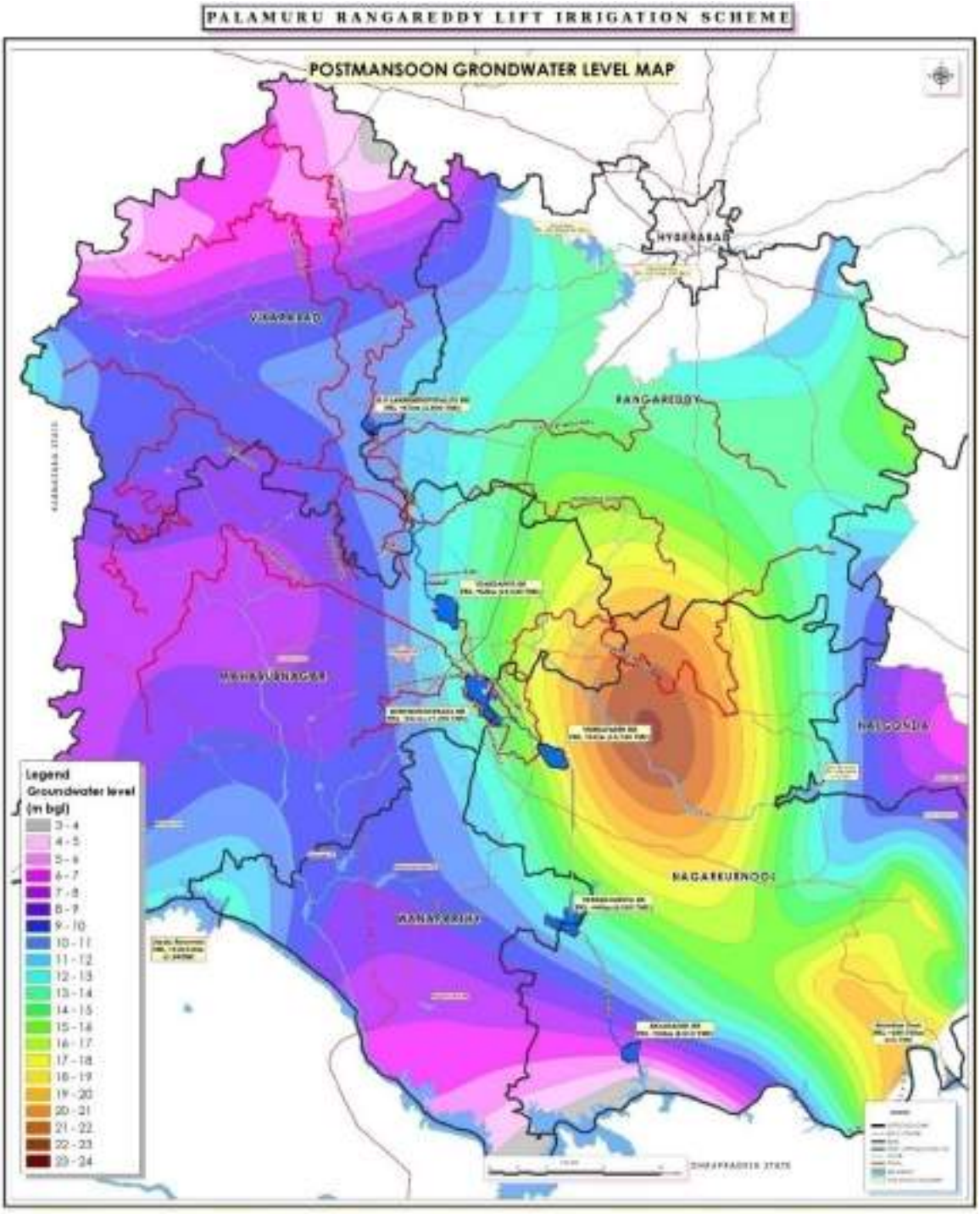


Figure 3.26: Water level contour map of PRLIS area (post-monsoon)

Table 3.35: Mandal -wise Categorisation of Erstwhile Rangareddy District

Sl.No.	Mandal	C/ NC/ T	Stage of ground water development [%]	Pre-monsoon		Post monsoon		Categorization
				Water Level Trend (cm/yr)	Is there significant Decline (Yes/No)	Water Level Trend (cm/yr)	Is there significant Decline (Yes/No)	
1	Balanagar	NC	16	-37.8	No	-27.1	No	Safe
2	Bantwaram	NC	62	-15.7	No	-17.1	No	Safe
3	Basheerabad	NC	34	-42.1	No	-56.9	No	Safe
4	Chevella	NC	62	-131.3	No	-179.9	No	Safe
5	Dharur	NC	55	-86.8	No	-47.5	No	Safe
6	Doma	NC	67	4.9	No	-26.4	No	Safe
7	Gandeed	NC	67	-59.0	No	-57.3	No	Safe
8	Ghatkesar	NC	38	-5.4	No	-53.1	No	Safe
9	Hayathnagar	NC	52	-37.9	No	-58.3	No	Safe
10	Ibrahimpatnam	NC	86	-78.2	No	7.9	No	Safe
11	Kandukur	NC	71	34.6	Yes	-41.1	No	Semi-Critical
12	Keesara	NC	63	-5.4	No	-53.1	No	Safe
13	Kulakcherla	NC	67	-59.0	No	-57.3	No	Safe
14	Maheshwaram	NC	83	-14.3	No	1.3	No	Safe
15	Malkajgiri	NC	24	-5.4	No	-53.1	No	Safe
16	Manchal	NC	78	-78.2	No	7.9	No	Safe
17	Marpally	NC	60	-37.3	No	-13.1	No	Safe
18	Medchal	NC	101	20.5	Yes	38.5	Yes	Over Exploited
19	Moinabad	NC	67	-103.7	No	-221.6	No	Safe
20	Mominpet	NC	73	8.9	No	-28.5	No	Safe
21	Nawabpet	NC	60	-5.03	No	-95.77	No	Safe
22	Pargi	NC	74	15.16	Yes	2.73	No	Semi-Critical
23	Peddamul	NC	68	-7.57	No	-6.71	No	Safe
24	Pudur	NC	43	-131.3	No	-179.9	No	Safe
25	Quthubullapur	NC	49	-37.79	No	-9.57	No	Safe
26	Rajendranagar	NC	33	-131.3	No	-179.9	No	Safe

Sl.No.	Mandal	C/ NC/ T	Stage of ground water development [%]	Pre-monsoon		Post monsoon		Categorization
				Water Level Trend (cm/yr)	Is there significant Decline (Yes/No)	Water Level Trend (cm/yr)	Is there significant Decline (Yes/No)	
27	Saroornagar	NC	24	-37.9	No	-58.3	No	Safe
28	Serilingampally	NC	18	-37.9	No	-27.1	No	Safe
29	Shabad	NC	86	15.4	Yes	-11.3	No	Semi-Critical
30	Shamirpet	NC	76	-4.2	No	-178.7	No	Safe
31	Shamshabad	NC	93	98.9	Yes	96.6	Yes	Critical
32	Shankarpally	NC	89	15.4	Yes	-11.3	No	Semi-Critical
33	Tandur	NC	32	-29.3	No	-20.9	No	Safe
34	Uppal	NC	27	-5.4	No	-53.1	No	Safe
35	Vikarabad	NC	42	-17.8	No	-11.9	No	Safe
36	Yacharam	NC	65	-142.2	No	-155.2	No	Safe
37	Yalal	NC	57	-12.0	No	-30.0	No	Safe

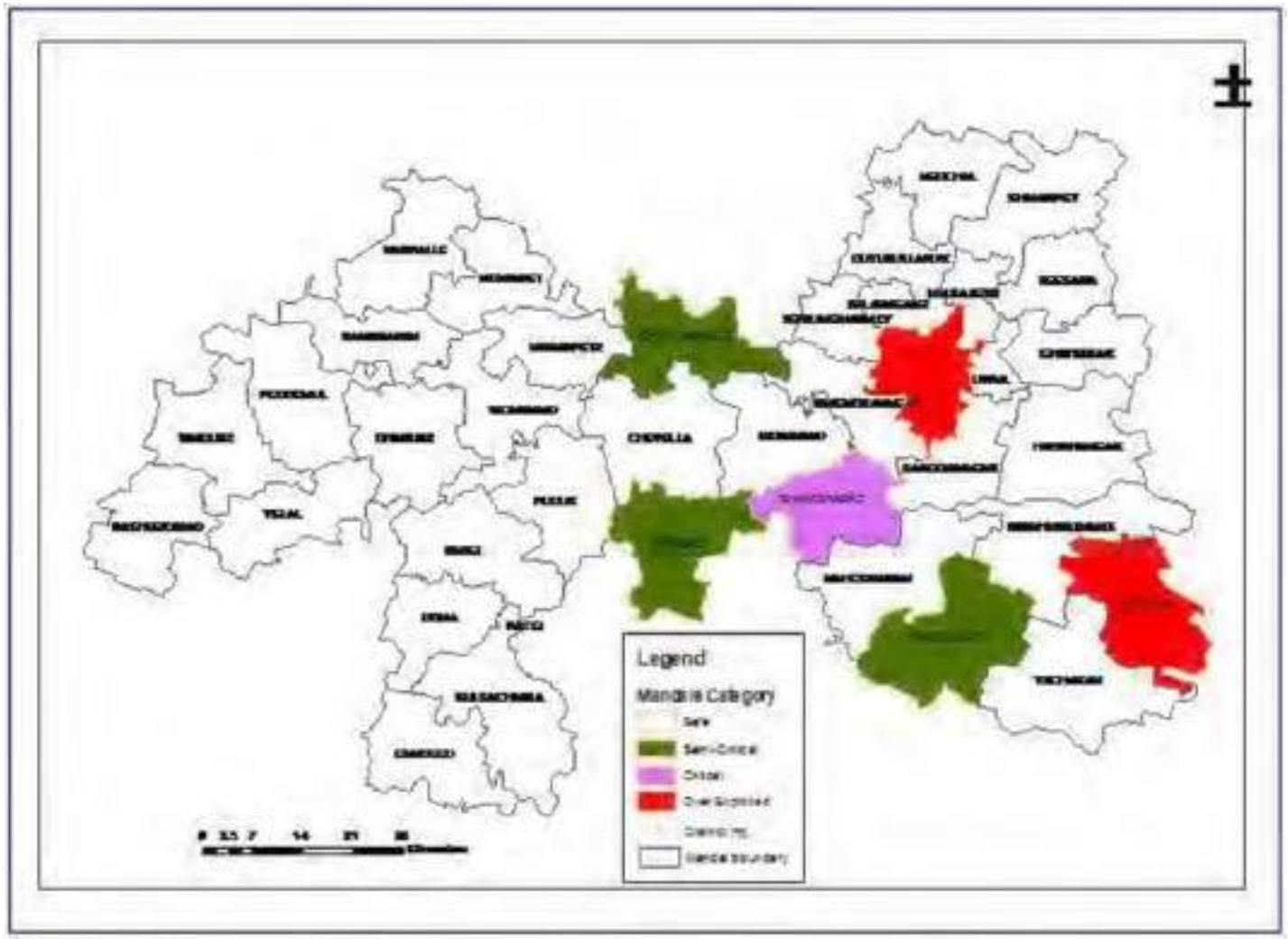


Figure 3.27: Mandal -wise Categorisation in Respect of Ground Water Development

Based on the Ground Water Estimation committee (G.E.C-97) norms, ground water assessment was done in May 2011 using the data up to 2008-09. The ground water resources available in command area and in non-command area of the district are 775.50 MCM and 1245.59 MCM respectively. The groundwater utilization in command area and in non-command area of the district is 186.95 MCM and 147.23 MCM respectively. So, the resultant groundwater balance in command area in non-command area of the district, are 588.55 MCM and 298.36 MCM respectively. Overall, the district falls under safe category with stage of development being at 56%. The stage of development in command area is 24% (safe) and in non-command area, it is 76% (semi-critical category). With respect to stage of development, 44 mandals are found to be safe, 10 semi-critical and 5 mandals viz., Thirumalgiri (104%), Jajireddi Gudem (107%), Nakrekal (102%), Suryapet (103%) and Kanagal (106%) are in over-exploited category. Categorisation of Mandals is shown in Fig.7. Semi-Critical, and Over-exploited mandals of Nalgonda district (other than safe categories) are listed **Table3.36**. As per ground water assessment done in May 2011 by the resources data up to 2008-09, 78 Villages were identified as over exploited and were proposed for notification in Nalgonda District. The Mandal wise categorization in respect of ground water development is presented in the **Figure 3.28.**

Table 3.36: Mandal -wise Categorisation of Nalgonda District

Semi-Critical	Stage of ground water Development (%)	Over Exploited	Stage of ground water Development (%)
1 Alair	77	1 Thirumalgiri	104
2 Thungathurthi	75	2 Jajireddi Gudem	107
3 Valigonda	74	3 Nakrekal	102
4 Bhongir	94	4 Suryapet	103
5 Kethepalle	77	5 Kanagal	106
6 Mothey	98		
7 Nalgonda	72		
8 Munugode	95		
9 Narayanapur	73		
10 Chandur	94		

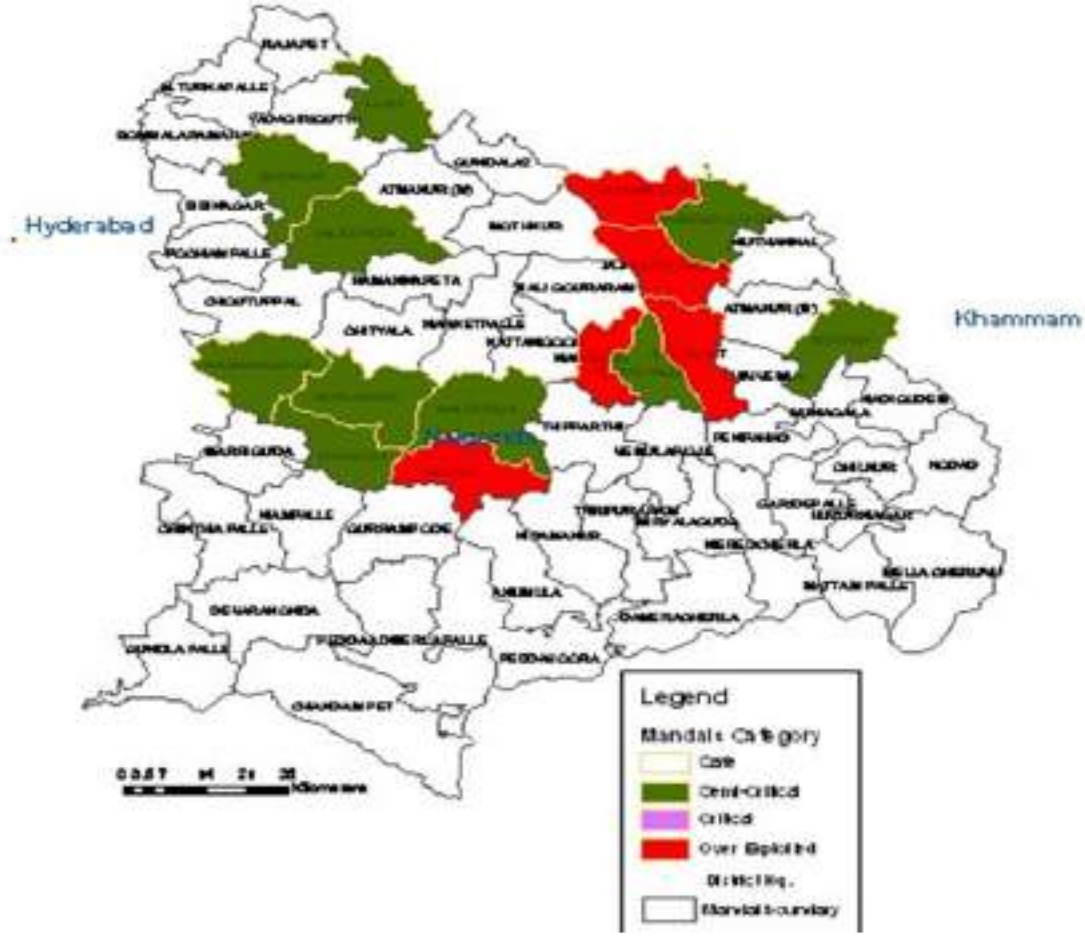


Figure 3.28: Mandal -wise Categorisation in Respect of Ground Water Development

f) Ground water Availability in project Area

The Net Groundwater Availability in the project area, was estimated using the Methodology (revised after GEC 1997) in The Report of the Groundwater Estimation Committee (GEC-2015), issued by the Ministry of Water Resources, River Development & Ganga Rejuvenation Government of India, October, 2017. Groundwater availability, in this study, is equated with the inflow or recharge components which include: i) Recharge from rainfall; and ii) Recharge from other sources. Estimation of rainfall recharge is carried out using two methods viz., rainfall infiltration factor method; and water level fluctuation method. GEC-97 has given Rainfall Infiltration Factors for 13 types of geological formations (across the country), for usage in estimation of groundwater recharge from rainfall, in a given geological situation.

g) Rainfall In-filtration Method

In rainfall infiltration factor method, recharge from rainfall is given by the equation: Recharge from Rainfall (RRF) = Area X Normal Monsoon Rainfall (NMR) X Rainfall Infiltration Factor (RIF). As there is no command area right now in the study area, computation was carried out only for non-command area. **Table 3.37** shows the results of estimation of rainfall recharge, using

rainfall recharge infiltration factor method, in PRLIS Command. It is estimated that total current groundwater recharge, as per RIF method, is 440.16 MCM.

Table 3.37: Recharge Due to Rainfall (RIF Method) in PRLIS Area

S.N.	Major Aquifer	Area	RIF	Rainfall (mm)		Rainfall Recharge (ha.m.)		
		ha.	%	Mon	Nonmon	Mon	Nonmon	Total
1	Basement Gneissic Complex	728,943.67	7	461.14	152.56	23,529.96	7,784.33	31,314.29
2	Basic Rock (Basalt)	123,336.10	13	564.74	142.52	9,054.81	2,285.14	11,339.95
3	Laterite/Ferruginous concretions	6,315.45	7	644.57	169.33	284.95	74.86	359.81
4	Migmatitic Gneiss	11,289.14	7	480.44	147.50	379.66	116.56	496.22
5	Schist	7,836.82	7	450.43	177.50	247.10	97.37	344.47
6	Shale with Sandstone	6,223.82	4	517.12	130.09	128.74	32.39	161.12
	Total	**883,945.00**				**33,625.22**	**10,390.64**	**44,015.86**
Rainfall Recharge - RIF Method - MCM						**336.25**	**103.91**	**440.16**
Rainfall Recharge - RIF Method - TMC ft.						**11.87**	**3.67**	**15.54**
%						**76.39**	**23.61**	**100.00**

h) Water Table Fluctuation Method

In water table fluctuation method**,** Recharge from Rainfall, is given as: Change in Storage (Δ S) = Rise in water level in monsoon season (h) X Specific Yield (SY) X Area of the HU. Water level (pre and post monsoon) data was collected from 26 observation wells of Central Ground Water Board (CGWB), for the last four years (2010-14).

Table 3.38 shows results of estimation of rainfall recharge in PRLIS area, using water table fluctuation method. The rainfall recharge (using WTF method) is computed as 516.75 MCM. (18.25 TMC).

Table 3.38: Recharge Due to Rainfall (WTF Method) in PRLIS Area

SN	Major Aquifer	Area	SyF	WL Rise	Monsoon Recharge
		ha.	%	m	ha.m.
1	Basement Gneissic Complex	728,943.67	1.5	3.31	36,190.51
2	Basic Rock (Basalt)	123,336.10	2	5.55	13,679.10
3	Laterite/Ferruginous concretions	6,315.45	2.5	5.00	789.43
4	Migmatitic Gneiss	11,289.14	1.5	2.33	395.12
5	Schist	7,836.82	1.5	2.50	293.88
6	Shale with Sandstone	6,223.82	1.5	3.50	326.75
	Total	**883,945.00**			**51,674.79**
Rainfall Recharge - Monsoon -WTF Method in MCM					**516.75**
Rainfall Recharge - Monsoon -WTF Method in TMC ft.					**18.25**

The recharge from rainfall, during monsoon period in a normal year, is finally adopted as per the recommendations of GEC. Monsoon rainfall recharge is taken as 1.2 times the value estimated by rainfall infiltration factor method, in case PD value is greater than +20 percent. Final computed values of recharge from rainfall in PRLIS area are shown in **Table 3.39**.

Table 3.39: Summary of Current Rainfall Recharge Estimate in PRLIS area

Method/Description	MCM	TMC Ft.
Monsoon Recharge estimated by water table fluctuation method	516.75	18.25
Monsoon Recharge estimated by Rainfall Infiltration method	336.25	11.87
Percentage Difference of two methods	**53.68**	**53.68**
Monsoon Rainfall Recharge adopted (RIF product X 1.2)	403.50	14.25
Non-monsoon Rainfall Recharge adopted (RIF product X 1.2)	124.69	4.40
Annual Rainfall Recharge (based on RIF and WTF products)	528.19	18.65

Total annual rainfall recharge estimated in PRLIS Command stood at **18.65** TMC ft., in a normal year. Rainfall recharge during monsoon period is estimated at 14.25 TMC ft., it was computed at 4.40 TMC ft., in the non-monsoon period. These computations were for **non-command** area only, in absence of any present command in the PRLIS area.

i) Secondary Recharge

Estimation of Secondary Recharge or the recharge from other sources has to be carried out again for command area and non-command areas separately. Important factors to be considered in estimation of secondary recharge from other sources were: i) seepage from canals; ii) recharge due to tanks/ponds; and iii) return flow from irrigation.

Recharge due to return flow from irrigation**,** is given by the equation: Recharge due to irrigation (in MCM) = IWA (irrigation water applied in MCM) X RFF (return flow factor as a fraction). GEC differentiates the crops as rice and non-rice, in estimation of secondary recharge from irrigation. IWA is computed by multiplying the area under rice/non-rice with the factors recommended by GEC (1.7 for rice and 0.79 for non-rice). The general post-monsoon water levels in PRLIS command are between 10 – 25 mbgl, and GEC Irrigation Return Flow Factor for rice cultivated area is 0.4 and for non-rice it is 0.2.

Table 3.40 shows the summary of the estimated current recharge from return flow from groundwater irrigation. It is estimated that the recharge due to return flow from groundwater irrigation in PRLIS area is 7.59 TMC ft. About of 93 percent (7.08 TMC ft.) of recharge is due to irrigation return flow from rice cultivation. About 66 percent (4.99 TMC ft.) of the recharge is during monsoon period.

Table 3.40: Estimated Current Recharge from Irrigation Return Flow, in PRLIS Area

Irrigated area under Rice (monsoon)	54,230	ha.		
Irrigated area under Rice (non-monsoon)	15,794	ha.		
Irrigated area under non-rice (monsoon)	13,421	ha.		
Irrigated area under non-rice (non-monsoon)	10,961	ha.		
Irrigation Return Flow Factor*	**Rice**	**Non-rice**		
Water Level (mbgl) - Monsoon Av. - 11 m bgl	43.30	23.70		
Water Level (mbgl) - Non-monsoon Av. - 14 m bgl	38.30	19.70		
	Ha.m.	**MCM**	**TMC ft.**	**%**
Irrigation Water Applied (monsoon)				
For rice cultivation (0.57 m/ha.)	30,911.10	309.11	10.92	
For non-rice cultivation (0.233 m/ha.)	3,127.09	31.27	1.10	
Irrigation Water Applied (non-monsoon)				

For rice cultivation (1.1m/ha.)	17,373.40	173.73	6.14	
For non-rice cultivation (0.329 m/ha.)	3,606.17	36.06	1.27	
Recharge due to irrigation (monsoon)	**14,125.63**	**141.26**	**4.99**	65.73
From rice cultivation	13,384.51	133.85	4.73	
From non-rice cultivation	741.12	7.41	0.26	
Recharge due to irrigation (non-monsoon)	**7,364.43**	**73.64**	**2.60**	34.27
From rice cultivation	6,654.01	66.54	2.35	
From non-rice cultivation	710.42	7.10	0.25	
RETURN FLOW FROM IRRIGATION - GROUNDWATER	**21,490.05**	**214.90**	**7.59**	

j) Net groundwater availability

As per GEC, unaccounted discharge is considered 10 percent (for rainfall infiltration method) of the total annual groundwater recharge. Net annual groundwater availability is the product of deduction of unaccounted natural discharges from the total recharge (rainfall and secondary). **Table 3.41** shows details of estimation.

Table 3.41: Net Annual Groundwater Availability in PRLIS Command area

Form of Groundwater Recharge	Recharge (MCM)			Recharge (TMC ft.)		
	Mon	Non-mon	Total	Mon	Non-mon	Total
Recharge from Rainfall	**403.50**	**124.69**	**528.19**	**14.25**	**4.40**	**18.65**
From canal seepage	-	-	-	-	-	-
From seepage of tanks and ponds	-	-	-	-	-	-
From return flow of Irrigation	141.26	73.64	214.90	4.99	2.60	7.59
Total Current Recharge	**544.76**	**198.33**	**743.09**	**19.24**	**7.00**	**26.24**
Unavoidable natural discharges (10%)	54.48	19.83	74.31	1.92	0.70	2.62
Net groundwater availability - Current	**490.28**	**178.50**	**668.78**	**17.31**	**6.30**	**23.62**

Net current groundwater availability of PRLIS is computed at 23.62 TMC ft., after accounting for unavoidable natural discharges (10%). About 73 percent (17.31 TMC ft.) of this is due to monsoon recharge. About 30 percent (6.30 TMC ft.) of the net groundwater availability is due to recharge from other sources, specifically from irrigation return flow.

3.9 BIOLOGICAL ENVIRONMENT

3.9.1 Biological Environment

The ecology is the scientific analysis and study of interactions among organisms and their environment. It is an interdisciplinary field that includes biology and Earth science. The biodiversity assessment and conservation discipline explore natural landscapes, species and ecosystems and acquires theories and practical methods in preserving environments and organisms. Biodiversity refers not only to endangered species but also to every organism, including microbes and fungi. Biodiversity assessment and conservation program increase

awareness and understanding of how human life depends on preserving animal species and natural ecosystems.

3.9.2 Objective of The Study

- To collect the baseline data for the study along with a description of the existing terrestrial, wetland and aquatic biodiversity.
- To assess the scheduled species (rare, endangered, critically endangered, endemic and vulnerable) in the proposed site.
- To identify the locations and features of ecological significance by reconnaissance survey.
- To identify the impacts of a proposed project before, after and during the development phases.
- To identify the livelihood dependency on NTFPs.
- To identify the phyto sociological study of flora.
- To assess the wildlife presence within the 10 km study area.

3.9.3 Study Approach

A systematic study was conducted to assess the floristic and faunal diversity in the study area and its environs. At first, a detailed phytosociological and faunal survey of balancing dam sites, canal alignment and Ayacut/command area site (10 km radius from the study area) were carried out to understand the status distribution of flora and fauna in the study area. Local inhabitants of approximately 27 villages of 05 project Districts viz., Mahbubnagar, Nagarkarnool Rangareddy, Vikrabad and Narayanpet were interviewed to understand the possible habitat, food and feeding habitat of RET & Scheduled wildlife species observed/reported the study area. The details of the villages surveyed is given in **Table 3.42 and Figure 3.29.**

Table 3.42: Study Area Considered for Vegetation Survey

Sl.No	Quadrat No.	GPS Coordinates	Study area Considered
1.	Q1	16°33'30.55"N, 78°17'50.55"E	Yatmatapur Village (Nagarkurnool District)
2.	Q2	16°33'53.90"N, 78°16'13.29"E	Kummera Village (Nagarkurnool District)
3.	Q3	16°36'55.66"N, 78°14'42.68"E	Venkaipally Village (Nagarkurnool District)
4.	Q4	16°39'45.21"N, 78°15'11.95"E	Marepalle Village (Nagarkurnool District)
5.	Q5	16°40'29.06"N, 78° 4'29.04"E	Botlagadda Thanda (Mahbubnagar District)
6.	Q6	16°43'59.60"N, 78° 8'26.93"E	Kistaram Village (Mahbubnagar District)
7.	Q7	16°42'21.40"N, 78° 2'55.89"E	Bhuthpur Village (Mahbubnagar District)
8.	Q8	16°51'39.61"N, 78° 1'59.77"E	Karkonda village (Mahbubnagar District)
9.	Q9	17° 1'40.02"N, 77°59'9.04"E	Edira Village (Ranga Reddy District)
10.	Q10	17° 3'31.12"N, 77°56'40.89"E	Pedda Yelkicherla Village (Ranga Reddy District)
11.	Q11	17°22'33.85"N, 77°48'53.17"E	Peelaram Village (Vikarabad District)
12.	Q12	17°30'29.38"N, 77°57'10.74"E	Yenkathala village (Vikarabad District)

Sl.No	Quadrat No.	GPS Coordinates	Study area Considered
13.	Q13	17°24'33.23"N, 78° 1'30.53"E	Gangeda Village (Vikarabad District)
14.	Q14	17°17'35.54"N, 78°16'41.10"E	Surangal Village (Rangareddy District)
15.	Q15	17°15'26.95"N, 77°43'51.42"E	Banapur Village (Vikarabad District)
16.	Q16	17°14'20.09"N, 78° 0'11.66"E	Changomul village (Vikarabad District)
17.	Q17	17°12'1.64"N, 78°27'13.86"E	Mankhal Village (Ranga Reddy District)
18.	Q18	17° 8'0.26"N, 78° 4'15.94"E	Tekulapally Village (Ranga Reddy District)
19.	Q19	17° 4'26.66"N, 78°31'7.28"E	Timmaypally village (Ranga Reddy District)
20.	Q20	16°58'34.33"N, 78°15'52.77"E	Madhurapur Village (Ranga Reddy District)
21.	Q21	16°52'24.71"N, 78°19'21.03"E	Lingamdana Village (Ranga Reddy District)
22.	Q22	16°46'30.70"N, 78°19'14.37"E	Vemula Village (Mahbubnagar District)
23.	Q23	17°10'22.60"N, 77°33'24.04"E	Juntpalle Village (Vikarabad District)
24.	Q24	17° 0'35.84"N, 77°38'21.27"E	Kothapalle Village (Narayanpet District)
25.	Q25	16°52'33.72"N, 77°39'6.17"E	Dorepalle village (Narayanpet District)
26.	Q26	16°45'25.23"N, 77°47'4.06"E	Koilkonda village (Mahbubnagar District)
27.	Q27	16°35'18.93"N, 77°36'54.30"E	Gunmukla (Narayanpet District)

3.9.4 Methodology For Faunal Study

In order to study the wild mammals, avifauna, here to fauna and insects of the project area 2-5 km transect trails were carried out in the different locations. The study area was divided into different strata based on vegetation and topography. Sampling for habitat and animals was done in different strata. As the normal systematic transects for mammals and birds were not possible in this study area due to difficult terrain, therefore mostly trails were used for faunal sampling.

- In addition to the field sampling secondary data and information was also collected as follows. The following secondary sources were referred for data collection:
  i. Birds of the Indian Subcontinent by R. Grimmett, C. Inskipp & T. Inskipp (Second Edittion,2014);
  ii. Salim Ali's Book of Indian Birds Indian Bird by Salim Ali (Thirteenth Revised Edition, 2002);
  iii. Bats of the Indian Subcontinent by Bates and Harrison (1997);
  iv. A Field Guide to Indian Mammals by Vivek Menon (2014);
  v. Scientific publications of Zoological Survey of India (Subsidiary Govt. organization under the control of Ministry of Environment and Climate Change (MoEF&CC), Govt. of India, New Delhi);
  vi. Scientific publications of Bombay Natural History Society (BNHS) and;
  vii. Scientific publications of Wildlife Institute of India (WII).
- Direct sighting and indirect evidences such as calls, signs and trophies of mammals were recorded along the survey routes taking aid from Prater (1980).
- Interviews of local villagers for the presence and relative abundance of various animal species within each locality.

3.9.5 Data Collection

The Baseline study for the existing ecological environment was carried out in a phased and constructive manner. Collection and generation of ecological data has been completed at two levels: Field Studies and Secondary data sources. Field Survey was conducted by a team comprised of terrestrial and aquatic ecologists during Monsoon (07th-28th August, 2019), post-Monsoon (5th-24th November 2019) and Pre-Monsoon (22nd February-12th March 2020). The specific parameters covered as part of primary level surveys/field studies have been described in the following paragraphs

3.9.6 Methodology For Floral Study

The study was carried out as per the specified methodology given in ToR issued by Ministry of Environment, Forest and Climate Change, Govt. of India vide ToR Letter: J-12011/31/2017-IA-I (R) dated 11th October, 2017. Random sample plots were laid out in different parts of the project area to accommodate maximum representation of different types of plants. Accordingly, quadrates of 10 m x 10 m for the study of trees were laid. Within these sample plot, sub-plots of 3 m x 3 m were laid out randomly for studying the shrub layer and regeneration of tree species. For information on ground layer including herbaceous species, quadrates of 1m x 1 m size were laid out. The cases of unidentified species were confirmed by cross checking then with herbarium and with the published literature. The primary data recorded on number of individuals in a species were utilized to derive secondary attributes like density, frequency and abundance following standard phytosociological methods of Misra (1968). Important Value Index was estimated following the formula developed by Cottam and Curtis (1956) taking into consideration of relative frequency and relative density. Formulas used for various calculations are as follows:

Frequency: It provides information on the number of times a species encountered.

$$\text{Frequency (\%)} = \frac{\text{Total number of quadrats in which species occur}}{\text{Total number of quadrats studied}} \times 100$$

Density or plants per unit area: The reciprocal of density provides an estimate of the mean growing space per plant and be of interest in some ecological studies.

$$\text{Density} = \frac{\text{Total number of individuals of a species}}{\text{Total number of quadrats studied}} \times \text{Area of quadrats}$$

Abundance: The density and frequency can be combined to obtain an estimate of the number of individuals per quadrat, or unit area for the quadrat in which the species occur, this measure is referred as abundance.

$$\text{Total number of individuals of species occurring}$$

$$\text{Abundance} = \frac{\text{Total number of quadrats in which species occur}}{\text{Total number of quadrats in which species occur}}$$

Relative Frequency

$$\text{Relative Frequency} = \frac{\text{Frequency of the Species}}{\text{Total frequency of all species}} \times 100$$

Relative Density

$$\text{Relative Density} = \frac{\text{Density of the Species}}{\text{Total density of all species}} \times 100$$

Relative Dominance

$$\text{Relative Dominance} = \frac{\text{Dominance of the Species}}{\text{Total dominance of all species}} \times 100$$

Importance Value Index (IVI)

IVI = Relative frequency + Relative Dominance + Relative Density

Index of Diversity: Species diversity is a product of two components: species richness and evenness (Simpson, 1949). Species diversity was estimated using Shannon Wiener Index (Pielou 1975 and Magurran 1988). This measurement takes into account subspecies richness and proportion of each species within a zone.

$$H' = -\sum_{i=1}^{s} \left(\frac{n_i}{N}\right) \ln\left(\frac{n_i}{N}\right)$$

Where, H´= Shannon-Wiener Diversity Index, S = Total number of species, N = Total number of individuals of all the species, and ni = number of individuals of the species.

Simpson's Index (**D**) measures the probability that two individuals randomly selected from a sample will belong to the same species (or some category other than species). There are two versions of the formula for calculating **D**. either is acceptable, but be consistent.

$$D = \Sigma (n / N)^2$$

$$D = \frac{\Sigma\, n(n-1)}{N(N-1)}$$

n = the total number of organisms of a particular species

N = the total number of organisms of all species

With this index, 0 represents infinite diversity and 1, no diversity. That is, the bigger the value of D, the lower the diversity. This is neither intuitive nor logical, so to get over this problem, D is often subtracted from 1 to give:

Simpson's Index of Diversity 1 - D

The value of this index also ranges between 0 and 1, but now, the greater the value, the greater the sample diversity. This makes more sense. In this case, the index represents the probability that two individuals randomly selected from a sample will belong to different species.

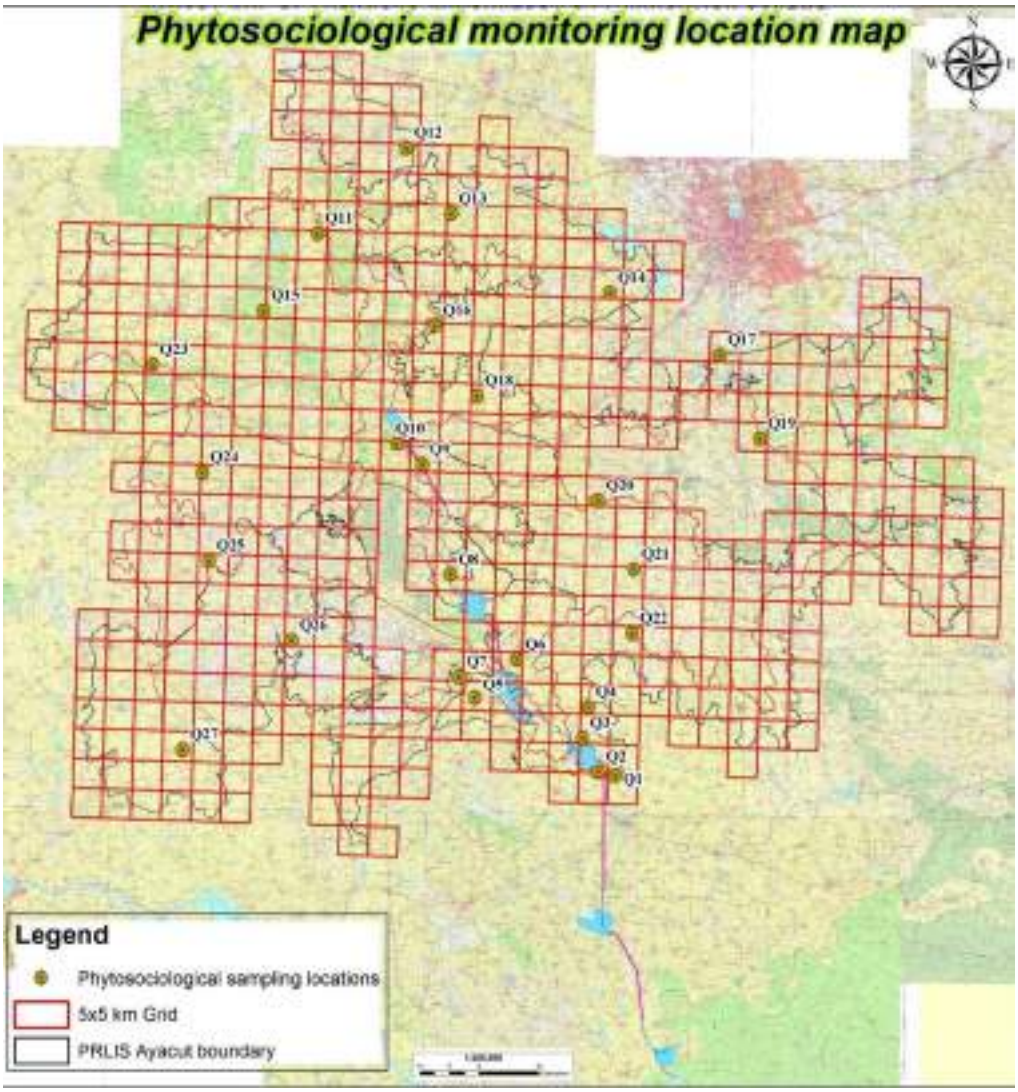


Figure 3.29: Location for Phytosociological (Vegetation) Survey within the Selected Grids

3.9.7 Collection of Secondary Data

Secondary data is collected i.e., Compartment History prepared by the Forest Department, Working Plan of the Area other relevant records such as plantation journals and records of wild life / forest offence cases.

3.9.8 Review / Reference of Relevant Literature/Books

To complete this study the information from published books, materials and scientific literature is relied upon.

3.9.9 Data Analysis

The data recorded through the quadrat-studies was analyzed to estimate the percentage frequency, abundance and density of each floristic species. The importance value index (IVI) for different tree species were determined by summing up the Relative Density, Relative Frequency and Relative Cover values. The following formulae were used for calculating the percentage frequency, abundance and density, as applicable, of the species identified in the Eighteen (18) quadrats studied at Nine (09) grids/locations:

Importance Value Index (IVI) was calculated for trees using following formulae: (a) Frequency:

3.9.10 Data Synthesis and Results

The primary data collected from the field are subjected to standard statistical tests and species are identified with reference to published books and materials. The study revealed following status of the species i.e., flora and fauna in the given area.

3.9.11 Flora

a) Forest Types

The State of Telangana is endowed with rich diversity of Flora and Fauna. The State has dense Teak forests on the northern part along the banks of river Godavari. As per the Champion & Seth Classification of Forest Types (1968), the forests in Telangana belong to three Forest Type Groups, which are further divided into 12 Forest Types. Recorded Forest Area (RFA) in the State is 26,904 sq km of which 20,353 sq km is Reserved Forest, 5,939 sq km is Protected Forest and 612 sq km is Unclassed Forests.

Based on the interpretation of IRS Resourcesat-2 LISS III satellite data of the period Nov 2017 to Jan 2018, the Forest Cover in the State is 20,582.31 sq km which is 18.36 % of the State's geographical area. In terms of forest canopy density classes, the State has 1,608.24 sq km under Very Dense Forest (VDF), 8,787.13 sq km under Moderately Dense Forest (MDF) and 10,186.94 sq km under Open Forest (OF). Forest Cover in the State has increased by 163.31 sq km as compared to the previous assessment reported in ISFR 2017.

As per Champion and Seth (1968) classification, following forest types were observed in the study area:

i) Dry deciduous forest

The trees begin to shade their leaves during December and between February and May. The forest looks very open and at times eye-soring but no area is completely leaflets at any one time of the year. Flowering and fruiting are generally far advanced before the first flush of new leaves appears with the conventional showers in April – May. These forests are widely spread in almost all districts of the state, where the soil conditions are poor. The forest composition does not show zonation. The common trees are *Albizia amara, Albizia odoratissima, Anogeissus latifolia, Azadirachta indica, Butea monosperma, Chloroxylon swietenia, Dalbergia latifolia, Madhuca longifolia var. latifolia, Pterocarpus marsupium, Strychnos nux-vomica, Terminalia spp*., etc. The bamboo, *Dendrocalamus strictus* is often found. *Dodonaea viscosa and Grewia spp*. are some of the shrubs found in these forests. The common climbers are *Combretum albidum*, *Hemidesmus indicus* and *Pergularia daemia*. Species of *Achyranthes aspera Aristida adscensionis, Fimbristylis cymosa, Heteropogon contortus, Hybanthus enneaspermus* etc. constitute the ground layer.

ii) Homogenous type of forest

Teak forest (5A/C1)

Teak forests are mainly natural teak growth and also plantations done by the forest department. Some characteristic tree species associated with Teak (*Tectona grandis*) in order of dominance are *Albizia amara, Butea monosperma, Anogeissus latifolia, Lannea coromandelica, Terminalia alata, Azadirachta indica*, etc.

Type (5A/C3) Southern Tropical Dry Mixed Deciduous Forest: This type of forest is attributed to relatively low rainfall and lower altitude. Many species growing in this forest type are common to the moist deciduous forests. The canopy is comparatively open allowing good percentage of grass and herb to grow. Species associated with this type include:

i. Top Canopy: *Tectona grandis, Madhuca indica, Anogeissus latifolia, Pterocarpus marsupium, Terminalia tomentosa, Dalbergia paniculata, Terminalia bellerica, Boswellia serrata*

ii. Middle Canopy: *Diospyros melanoxylon, Chloroxylon swietenia, Buchnania lanzan, Lannea coromandelica Lower Canopy: Albizia amara, Wrightia tinctoria, Alangium salvifolium, Emblica officinalis, Annona squamosa, Calophyllum inophyllum, Diospyros chloroxylon, Zizyphus glabrata*

iii. Ground flora: *Caesalpinia lacerans, Gymnosporia spinosa, Randia spinosa, Butea monosperma, Lantana camara, Cynodon dactylon, Cymbopogon martinii, Cymbopogon schoenanthus*

Type 6A/C2 Southern Tropical Dry Thorn Forest: This type of forest may represent open forest in which thorny and usually hardwood species predominates. The trees have short boles and low branching crowns. Their usual height is up to 8 meters. There is usually a mixture of relatively few species. There is an ill-defined second storey of smaller trees and large crowned shrubs. The vegetation is mostly spiny and often with xerophytic character, extending down to low shrub growth. There is usually a thin grass growth which may appear during the short rainy season but more or less the soil is bare and devoid of any grass growth. Climbers are few,

showing xerophytic adaptations. Stunted trees of the dry deciduous forest occur throughout the forest, notable among them being Anogeissus latifolia and Soymida febrifuga. Species associated with this type include:

i. Top Canopy and Middle Canopy: *Lagerstroemia parviflora, Diospyros chloroxylon, Albizia amara, Acacia sundra, Chloroxylon swietenia,* etc.

ii. Lower Canopy: *Zizyphus, Maytenus senagalensis, Dodonea viscosa, Randia dumetorum, Lantana camera and* a few climbers are also present.

b) Floristics

For sampling of flora in the area, study was conducted in four sampling locations with categorizing the area in four segments as upstream area of project, dam site and nearby area, power house and downstream area of power house. The objective of zonation of the study area was to evaluate the qualitative and quantitative aspects of floral wealth in and around the project vicinity. Details of segments and sampling locations considered for the floristic study are given in **Table 3.-43** as follows:

Table 3.43: Segments and Sampling Locations Considered for Floristic Study

Sl. No.	Sampling Site	Segments considered for Sampling	Sampling Locations	District
1.	S-1	Land area in the environs of Venkatadri and Kurumurthyraya and along the alignment in the reservoirs	Yatmatapur Village Kummera Village Venkaipally Village Marepalle Village	Nagarkurnool District
			Botlagadda Thanda Kistaram Village Bhuthpur Village Karkonda village	Mahbubnagar District
2.	S-2	Land area in the environs of Udandpur & K.P. Laksmidevipalle Reservoirs and land area along the alignment in the reservoirs	Edira Village Pedda Yelkicherla Village	Ranga Reddy District
3.	S-3	Command/Ayacut Area in the Left-Hand Side of the alignment in NW direction	Peelaram Village Banapur Village Juntpalle Village	Vikarabad District
			Kothapalle Village Dorepalle Village Koikonda Village Gunmukla Village	Narayanpet District
4.	S-4	Command/Ayacut Area in the Right-Hand Side of the alignment in NE direction	Yenkathala village Gangeda Village Changomul village	Vikarabad
			Surangal Village Mankhal Village	Ranga Reddy

Sl. No.	Sampling Site	Segments considered for Sampling	Sampling Locations	District
			Tekulapally Village Timmaypally village Madhurapur Village Lingamdana Village	
			Vemula Village	Mahbubnagar

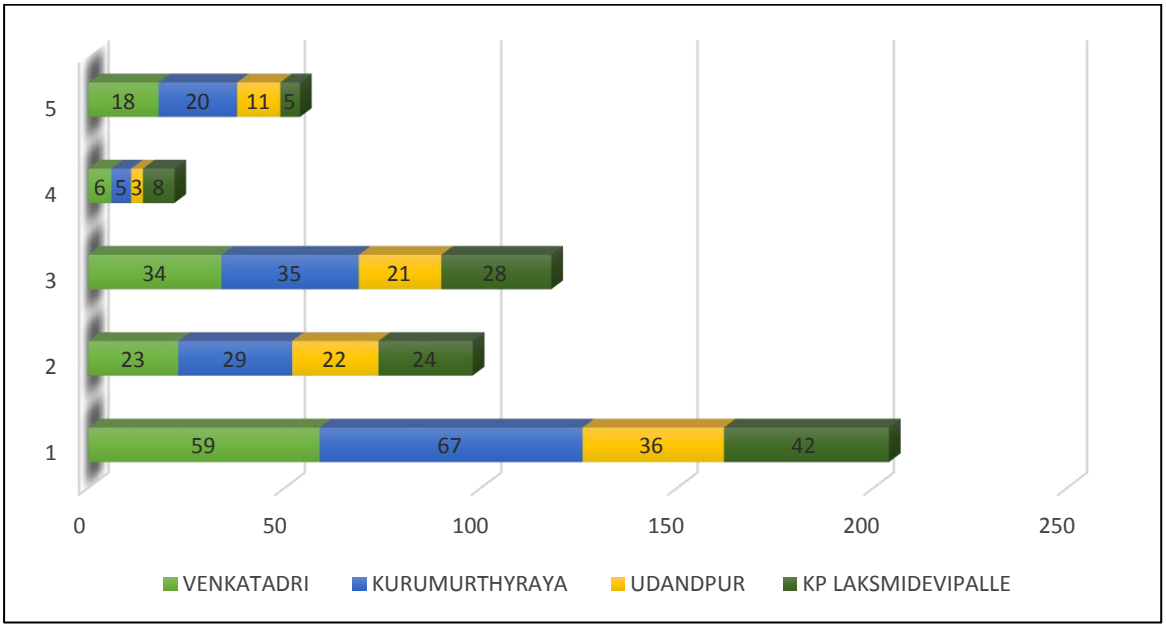
c) Inventorisation of Flora at reservoirs sites

The floral evaluation was carried out at 04 reservoirs during the study period. The vegetation status reservoir wise is shown in **Table 3.44.** Among 04 reservoirs, the maximum plant species were seen at Kurumurthyraya Reservoir with 66 species belonging to 24 families consisting of 34 trees, 5 shrubs, 20 herbs, grasses and climbers respectively.

Table 3.44: Reservoir Wise Status of Vegetation During The Study Period

S.N.	Reservoir	Total Species	Families	Trees	Shrubs	Herbs, Grasses & Climbers
1.	VENKATADRI	59	23	34	6	18
2.	KURUMURTHYRAYA	66	24	34	5	20
3.	UDANDPUR	36	22	21	3	11
4.	KP LAKSMIDEVIPALLE	42	24	28	8	5

**Source: Primary Field Survey Carried out by VSPL*



**Source: Analysis carried out by VSPL*

Figure 3.30: Reservoir wise vegetation status

The least representation of species was observed at K.P. Laksmidevipalle Reservoir with 42 species belonging to 24 families consisting of 28 trees, 8 shrubs, 5 herbs, grasses climber as shown in Figure 3.30. Familywise distribution of plant species is given in Figure 3.31. The list of the species reservoir wise is given in **Table 3.45** as follows:

Table 3.45: Reservoir Wise Details of Plant Species Recorded During The Study Period

S No	Local Name	Botanical Name	Family	VENKATADRI	KURUMURTHYRAYA	UDANDPUR	KP LAKSMIDEVIPALLE
Trees							
1.	Pedda Manu	*Ailanthus excelsa*	Simaroubaceae	+	+	-	+
2.	Udugu	*Alangium salviifolium*	Cornaceae	+	+	+	+
3.	Narlinga	*Albizia amara*	Fabaceae	+	+	+	-
4.	Thiruma	*Anogeissus latifolia*	Combretaceae	+	+	-	+
5.	Vepa	*Azadirachta indica*	Meliaceae	+	+	+	+
6.	Guggilamu	*Boswellia serrata*	Burseraceae	+	+	+	+
7.	Kora maddi	*Bridelia retusa*	Phyllanthaceae	+	+	-	-
8.	Modugu	*Butea monosperma*	Fabaceae	+	-	+	+
9.	Rela	*Cassia fistula*	Fabaceae	+	+	+	+
10.	Getregi	*Dalbergia latifolia*	Fabaceae	+	+	+	+
11.	Pachari	*Dalbergia paniculata*	Fabaceae	+	+	-	+
12.	Tuniki	*Diospyros melanoxylon*	Ebenaceae	+	+	+	-
13.	Eucalyptus	*Eucalyptus globulus*	Myrtaceae	+	+	+	+
14.	Tellapoliki	*Givotia rottleriformis*	Euphorbiaceae	+	+	-	+
15.	Nemalinara	*Holoptelea integrifolia*	Ulmaceae	+	+	+	+
16.	Chennangi	*Lagerstroemia parviflora*	Lythraceae	+	-	+	+
17.	Gumpena	*Lannea coromandelica*	Anacardiaceae	+	+	-	+
18.	Korivi	*Lepisanthes tetraphylla*	Sapindaceae	+	+	-	-
19.	Velaga	*Limonia acidissima*	Rutaceae	+	+	+	+
20.	Ippa	*Madhuca longifolia*	Sapotaceae	+	+	+	+
21.	Botta Ganumu	*Mitragyna parvifolia*	Rubiaceae	+	+	+	+
22.	Naguru	*Premna tomentosa*	Lamiaceae	+	+	+	+
23.	Narepa	*Prioria pinnatum*	Fabaceae	+	+	+	+
24.	Chekkera	*Salvadora persica*	Salvadoraceae	+	+	+	+
25.	Sumi	*Soymida febrifuga*	Meliaceae	+	+	+	+
26.	Musli	*Strychnos nux-vomica*	Loganiaceae	+	+	-	-
27.	Chilla	*Strychnos potatorum*	Loganiaceae	+	+	+	+
28.	Alla Neredu	*Syzygium cumini*	Myrtaceae	+	+	+	+
29.	Teku	*Tectona grandis*	Lamiaceae	+	+	+	+
30.	Erumaddi	*Terminalia arjuna*	Combretaceae	+	+	+	+

S No	Local Name	Botanical Name	Family	VENKATADRI	KURUMURTHYRAYA	UDANDPUR	KP LAKSMIDEVIPALLE
31.	Tanikaya	*Terminalia bellirica*	Combretaceae	+	+	+	-
32.	Asana	*Terminalia tomentosa*	Combretaceae	+	+	-	+
33.	Morlee	*Trema orientalis*	Cannabaceae	+	+	+	+
34.	Palakodisha	*Wrightia tinctoria*	Apocynaceae	+	-	-	-
35.	Sumi	*Soymida febrifuga*	Meliaceae	+	+	+	+
36.	Yepi	*Hardwickia binata*	Caesalpiniaceae	-	+	-	+
37.	Goompana chettu	*Lannea coromandelica*	Anacardiaceae	-	+	+	+
Shrubs							
1.	Addarsham	*Adhatoda zeylanica*	Acanthaceae	+	-	-	-
2.	Seethaphalam	*Annona squamosa*	Annonaceae	-	-	+	+
3.	Jilledu	*Calotropis gigantea*	Apocynaceae	+	-	-	-
4.	Marrga	*Catunaregam spinosa*	Rubiaceae	+	-	-	+
5.	Jibilika	*Grewia hirsuta*	Malvaceae	-	-	+	-
6.	Vadampiri	*Helicteres isora*	Malvaceae	+	-	-	+
7.	Nepalam	*Jatropha curcas*	Euphorbiaceae	+	-	-	-
8.	Thulasi	*Ocimum tenuiflorum*	Lamiaceae	-	+	-	+
9.	Konda Papidi	*Tarenna asiatica*	Rubiaceae	-	-	+	-
10.	Bankitutthuri	*Triumfetta rotundifolia*	Tiliaceae	-	+	-	+
11.	Indhuvara	*Vitex negundo*	Lamiaceae	-	+	-	-
12.	Suganda	*Wrightia antidysenterica*	Apocynaceae	-	+	-	+
13.	Chimachipuru	*Grewia hirsute*	Malvaceae	-	+	-	+
14.	Sogasulachettu	*Lagerstroemia parviflora*	Lythraceae	+	-	-	+
Herbs, Grasses and Climbers							
1.	Guriginja	*Abrus precatorius*	Fabaceae	+	-	-	-
2.	Adavi Draaksha	*Ampelocissus tomentosa*	Vitaceae	+	+	-	+
3.	Nelavemu	*Andrographis paniculata*	Acanthaceae	+	+	-	-
4.	Chandra Poda	*Argyreia sericea*	Convolvulaceae	-	+	-	+
5.	Cheepuru Gaddi	*Aristida setacea*	Poaceae	-	+	-	-
6.	Gadidagdapa	*Aristolochia bracteolata*	Aristolochiaceae	+	+	+	-
7.	Rudraksha	*Byttneria herbacea*	Malvaceae	+	+	-	-
8.	Garike	*Cynodon dactylon*	Poaceae	-	+	+	-
9.	Sanni gida	*Dicoma tomentosa*	Asteraceae	+	+	-	-
10.	Mauu akiaki	*Fimbristylis cymosa*	Cyperaceae	+	+	+	-

S No	Local Name	Botanical Name	Family	VENKATADRI	KURUMURTHYRAYA	UDANDPUR	KP LAKSMIDEVIPALLE
11.	Adavinabhi	*Gloriosa superba*	Colchicaceae	+	-	-	+
12.	Kumeria	*Heteropogon contortus*	Poaceae	+	+	+	-
13.	Sirna tulasi	*Hyptis suaveolens*	Lamiaceae	-	+	+	-
14.	Mungarimolaka	*Iphigenia mysorensis*	Colchicaceae	+	+	+	-
15.	Badak Kerbau	*Knoxia sumatrensis*	Rubiaceae	+	+	+	-
16.	Pilliadugu	*Mucuna pruriens*	Fabaceae	+	+	+	-
17.	Nela thappidi	*Orthosiphon rubicundus*	Lamiaceae	+	+	+	-
18.	Nelausiri	*Phyllanthus amarus*	Euphorbiaceae	+	+	+	-
19.	Peramutti	*Pulicaria wightiana*	Asteraceae	+	+	+	-
20.	Nela Alumu	*Rhynchosia minima*	Fabaceae	+	+	-	-
21.	Niruboddi	*Rivea hypocrateriformis*	Convolvulaceae	-	+	-	+
22.	Bonta vempali	*Tephrosia villosa*	Fabaceae	+	-	-	-
23.	Palleru	*Tribulus terrestris*	Zygophyllaceae	+	+	-	+

+=Present; - = Absent

**Source: Primary Field Survey Carried out by VSPL*

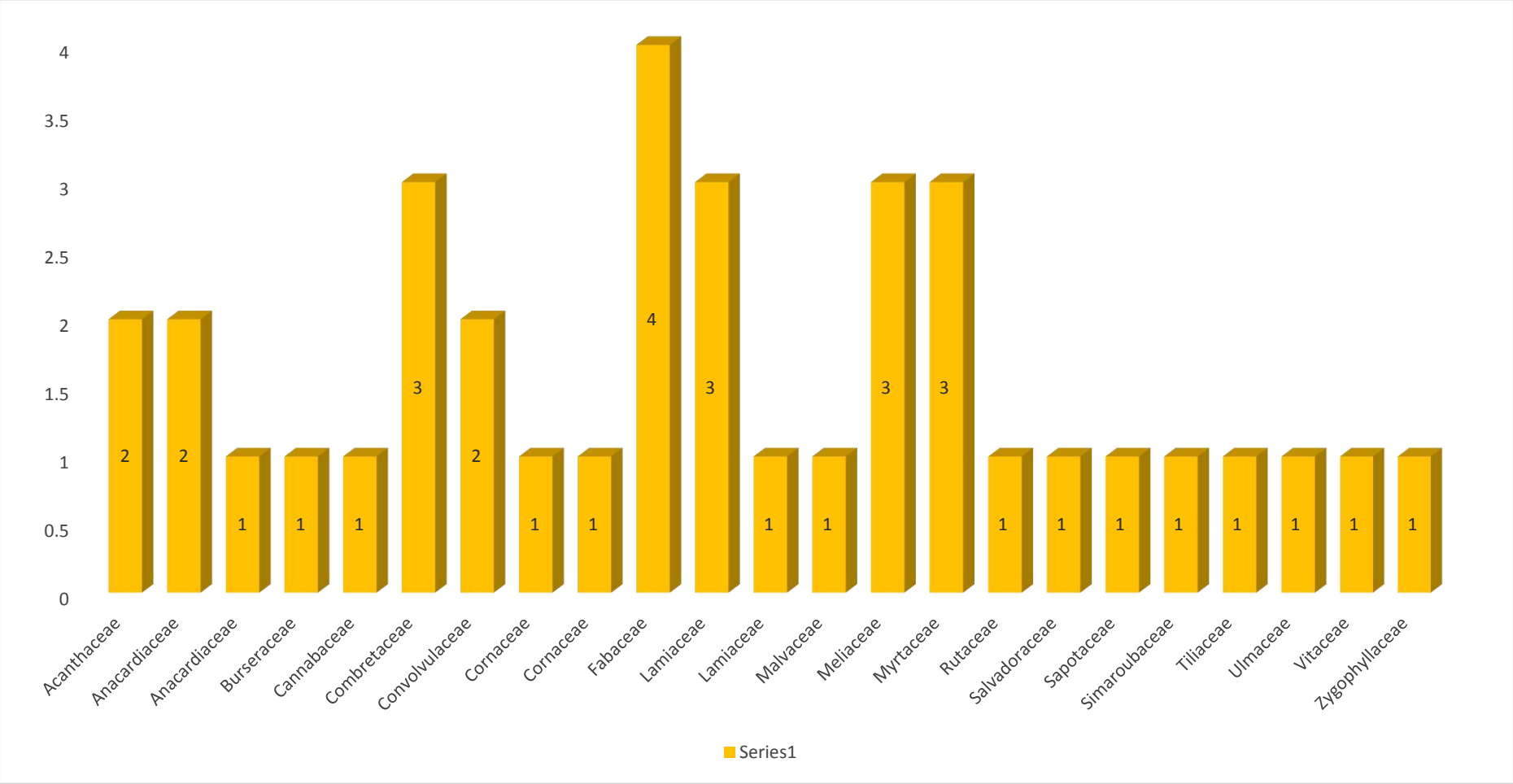


Figure 3.31: Family-Wise distribution of Species Recorded during Site Visit

3.9.11.1.1 Economically Important Tree Species

During the field survey, numbers of plant species which are of economic importance in the area were recorded. These plants are used by local people for various purposes in their day-to-day life. These species include timber wood, fruits yielding trees, charcoal, firewood and tannin yielding trees etc. The information pertaining to the economic use of the locally found species was collected from knowledgeable and elderly persons from villages located in the study area and its environs. In addition, data and information on these plant species was also collected by consulting literature and relevant secondary sources.

About 14 economically important plant species were recorded from the study area. Plants of economic importance such as timber yielding (Teak-*Tectona grandis*) and Eucalyptus *(Eucalyptus globulus), (*Narlinga-*Albizia amara*), edible fruits yielding, Alla Neredu -*Syzygium cumini* were common in the study area. The names of economically important recorded during the survey have been listed in **Table 3.46.**

Table 3.46: Economically Important Tree Species Found in The Study Area

S No	Local Name	*Botanical Name*	Family	Economic Uses
Trees				
1.	Narlinga	*Albizia amara*	Fabaceae	Construction and furniture, and as a firewood.
2.	Thiruma	*Anogeissus latifolia*	Combretaceae	Dye & Tanning
3.	Modugu	*Butea monosperma*	Fabaceae	Dye & Natural Colors
4.	Getregi	*Dalbergia latifolia*	Fabaceae	Foliage used as fodder. It yields a dark amber, strong flavored honey
5.	Tuniki	*Diospyros melanoxylon*	Ebenaceae	leaves are used for making beedis
6.	Eucalyptus	*Eucalyptus globulus*	Myrtaceae	Wood of Timber
7.	Tellapoliki	*Givotia rottleriformis*	Euphorbiaceae	high economic importance with wide applications
8.	Velaga	*Limonia acidissima*	Rutaceae	The fruit is used to make a fruit juice with astringent properties and jams. Ripe fruit can be used as "aachar"
9.	Ippa	*Madhuca longifolia*	Sapotaceae	The flower is edible and is a food item for tribal
10.	Botta Ganumu	*Mitragyna parvifolia*	Rubiaceae	Wood of Timber
11.	Chekkera	*Salvadora persica*	Salvadoraceae	charcoal and firewood
12.	Alla Neredu	*Syzygium cumini*	Myrtaceae	Edible fruits
13.	Teku	*Tectona grandis*	Lamiaceae	Wood of Timber
14.	Morlee	*Trema orientalis*	Cannabaceae	Charcoal and wood of timber

3.9.11.1.2 Plants of Ethno botanical/medicinal Importance

People living in the study area of this project use number of plants for medicinal/ethno-botanical purposes. They use these locally available plant species are used internally for treating diarrhea, dysentery, cough, cold, fever and asthma and externally for rheumatism, excessive bleeding, cuts, boils and injuries. A list of medicinal plants located in the project study area is given in **Table 3.47.**

Table 3.47: Commonly Used Medicinally Important Plant Species

Sl. No.	Species	Family	Part Used	Aliment Cured
1.	*Abrus precatorius*	Fabaceae	Roots, Leaves	Cough & Cold
2.	*Aegle marmelos*	Rutaceae	Tender leaves, Fruits, pulp & bark	Diarrhea & dysentery
3.	*Annona squamosa*	Annonaceae	Seed Powder	Insecticides
4.	*Azadirachta indica*	Meliaceae	Bark, Leaves, Seeds	Abdominal pain, fever, diarrhea etc.
5.	*Butea monosperma*	Fabaceae	Seeds, flower, gum	Diarrhea
6.	*Calotropis gigantea*	Apocynaceae	Leaves, Latex, Roots	Headache, earache, boils, pain in arms and legs etc.
7.	*Cassia fistula*	Fabaceae	Tender leaves, Fruits, pulp & bark	Laxative Ringworm, intestinal worms in infants
8.	*Emblica officinalis*	Euphorbiaceae	Fruits	Anemia, Vomiting, general good health, hair growth
9.	*Gloriosa superba*	Colchicaceae	Tuber, seeds	Rheumatism
10	*Ocimum tenuiflorum*	Lamiaceae	Leaves, Leaves Oil	Cough & Cold, Bronchitis
11	*Oroxylum indicum*	Bignoniaceae	Root, Bark	Diarrhea, dysentery, sore back for cattle etc.
12	*Phyllanthus amarus*	Euphorbiaceae	All Parts	Teeth Problems
13	*Strychnos nux-vomica*	Loganiaceae	Wood Powder	Nervous disorder, ulcers wounds, fever etc.
14	*Syzygium cumini*	Myrtaceae	Fruits	Vomiting, excessive menstruation
15	*Terminalia arjuna*	Combretaceae	Bark	Urinary Tract Infection, hormonal imbalance, relieve bleeding conditions etc.
16	*Terminalia bellirica*	Combretaceae	Bark	High cholesterol and digestive disorders, including both diarrhea and constipation, and indigestion.
17	*Vitex negundo*	Lamiaceae	Leaf	Swelling

3.9.11.1.3 Community Structure

A total of 191 plant species consisting 67 tree species, 51 shrubs species and 73 herbs and grasses belonging to 50 familes were recorded during the study period. Among trees *Azadirachta indica, Albizia amara, Cassia fistula, Dalbergia latifolia, Dalbergia paniculata*and, *Butea monosperma*are most dominant and frequently occurring species**.** Other trees such *Tectona grandis, Boswellia serrata, Ailanthus excels, Emblica officinalis, Trema orientalis*and Syzygium cuminietc.are also

present in the study area in large areas. A total of 33 species recorded during the study period, all the 33 species were recorded during the post-monsoon, pre-monsoon and monsoon study **(Table 3.48).**

Shrub layer is comprised of the predominant species such as *Calotropis gigantean, Vitex negundo Jatropha curcas and Adhatoda zeylanica* followed by other commonly found species such as *Tarenna asiatica, Grewia hirsute* and *Helicteres isora* etc. A total of 12 species recorded during the study period **(Table 3.49).**

The herbaceous vegetation in the study area is predominated by various perennial grasses, herbs and climbers such as *Abrus precatorius, Ampelocissus tomentosa, Aristolochia bracteolate, Cynodon dactylon, Gloriosa superba, Heteropogon contortus and Tribulus terrestris* while few annual herbaceous vegetation such as *Phyllanthus amarus, Andrographis paniculata, Argyreia sericea and Aristida setacea* etc. can be easily found in the study area during monsoon season **(Table 3.50).**

Table 3.48: Community Structure for Overstorey Vegetation (Trees) in the Study Area

S.No.	Botanical Name	Family
1	*Abelmoschus ficulneus*	Fabaceae
2	*Abrus precatorius*	Fabaceae
3	*Abutilon indicum*	Fabaceae
4	*Acacia chundra*	Fabaceae
5	*Acacia farnesiana*	Rutaceae
6	*Acacia ferruginea*	Cornaceae
7	*Acacia intsia*	Fabaceae
8	*Acacia leucophloea*	Fabaceae
9	*Acacia nilotica*	Amaranthaceae
10	*Achyranthes aspera*	Annonaceae
11	*Adhatoda zeylanica*	Combretaceae
12	*Aegle marmelos*	Poaceae
13	*Aerva lanata*	Meliaceae
14	*Aeschynomene aspera*	Zygophyllaceae
15	*Ageratum conyzoides*	Fabaceae
16	*Alangium salviifolium*	Malvaceae
17	*Albizia amara*	Burseraceae
18	*Albizia lebeck*	Phyllanthaceae
19	*Albizia odoratissima*	Anacardiaceae
20	*Allmania nodiflora*	Fabaceae
21	*Alysicarpus monilifer*	Fabaceae
22	*Alysicarpus vaginalis*	Malvaceae
23	*Amaranthus spinosus*	Rutaceae
24	*Ampelocissus latifolia*	Phyllanthaceae
25	*Ampelocissus tomentosa*	Fabaceae
26	*Andrographis paniculata*	Fabaceae
27	*Anisomeles indica*	Ebenaceae
28	*Annona squamosa*	Ebenaceae
29	*Anogeissus latifolia*	Moraceae
30	*Apluda mutica*	Rubiaceae

S.No.	Botanical Name	Family
31	*Argyreia nervosa*	Malvaceae
32	*Aristida adscensionis*	Tiliaceae
33	*Aristida setacea*	Rubiaceae
34	*Aristolochia bracteolata*	Fabaceae
35	*Aristolochia indica*	Poaceae
36	*Balanites aegyptiaca*	Ulmaceae
37	*Bauhinia racemosa*	Violaceae
38	*Blepharis maderaspatensis*	Fabaceae
39	*Boerhavia diffusa*	Cyperaceae
40	*Bombax ceiba*	Lythraceae
41	*Boswellia serrata*	Sapotaceae
42	*Breynia vitis-idaea*	Annonaceae
43	*Bridelia montana*	Rubiaceae
44	*Bridelia retusa*	Rubiaceae
45	*Buchanania cochinchinensis*	Lamiaceae
46	*Butea monosperma*	Malvaceae
47	*Butea superba*	Phyllanthaceae
48	*Byttneria herbacea*	Euphorbiaceae
49	*Cajanus scarabaeoides*	Fabaceae
50	*Calotropis gigantea*	Fabaceae
51	*Calotropis procera*	Asteraceae
52	*Canthium coromandelium*	Fabaceae
53	*Carissa spinarum*	Anacardiaceae
54	*Cassia fistula*	Meliaceae
55	*Catunaregam spinosa*	Rubiaceae
56	*Cayratia pedata*	Loganiaceae
57	*Ceiba pentandra*	Loganiaceae
58	*Celosia argentea*	Myrtaceae
59	*Chloroxylon swietenia*	Rubiaceae
60	*Cissampelos pareira*	Combretaceae
61	*Cleistanthus collinus*	Combretaceae
62	*Clerodendrum phlomoides*	Combretaceae
63	*Cocculus hirsutus*	Combretaceae
64	*Corchorus aestuans*	Malvaceae
65	*Crotalaria medicaginea*	Apocynaceae
66	*Crotalaria ramosissima*	Fabaceae
67	*Cyanthillium cinereum*	Rhamnaceae

Table 3.49: Community Structure for Shrubs in the Study area

S.No.	Botanical Name	Family
1.	*Cymbopogon citratus*	Malvaceae
2.	*Cynodon dactylon*	Fabaceae
3.	*Cyperus clarkei*	Malvaceae
4.	*Dalbergia lanceolaria*	Mimosaceae
5.	*Dalbergia latifolia*	Acanthaceae
6.	*Dalbergia sissoo*	Vitaceae
7.	*Derris scandens*	Lamiaceae
8.	*Dichrostachys cinerea*	Annonaceae
9.	*Dicoma tomentosa*	Convolvulaceae
10.	*Dinebra retroflexa*	Aristolochiaceae
11.	*Dioscorea oppositifolia*	Phyllanthaceae
12.	*Dioscorea pentaphylla*	Euphorbiaceae
13.	*Diospyros chloroxylon*	Fabaceae
14.	*Diospyros melanoxylon*	Fabaceae
15.	*Dodonaea viscosa*	Apocynaceae
16.	*Dolichandrone atrovirens*	Apocynaceae
17.	*Echinops echinatus*	Rubiaceae
18.	*Elytraria acaulis*	Apocynaceae
19.	*Eragrostiella bifaria*	Rubiaceae
20.	*Erythroxylum monogynum*	Vitaceae
21.	*Euphorbia caducifolia*	Menispermaceae
22.	*Euphorbia hirta*	Phyllanthaceae
23.	*Evolvulus alsinoides*	Lamiaceae
24.	*Ficus hispida*	Menispermaceae
25.	*Ficus mollis*	Fabaceae
26.	*Fimbristylis cymosa*	Fabaceae
27.	*Flacourtia indica*	Dioscoreaceae
28.	*Flueggea leucopyrus*	Sapindaceae
29.	*Gardenia gummifera*	Erythroxylaceae
30.	*Gardenia latifolia*	Euphorbiaceae
31.	*Getonia floribunda*	Salicaceae
32.	*Gloriosa superba*	Phyllanthaceae
33.	*Glossocardia bosvallia*	Rubiaceae
34.	*Gmelina arborea*	Combretaceae
35.	*Gomphrena serrata*	Malvaceae
36.	*Grewia flavescens*	Apocynaceae
37.	*Grewia hirsuta*	Celastraceae
38.	*Grewia tiliifolia*	Malvaceae
39.	*Gymnema sylvestre*	Apocynaceae
40.	*Gymnosporia emarginata*	Apocynaceae
41.	*Haldina cordifolia*	Oleaceae
42.	*Hardwickia binata*	Euphorbiaceae
43.	*Helicteres isora*	Plumbaginaceae
44.	*Hemidesmus indicus*	Arecaceae
45.	*Heteropogon contortus*	Plumbaginaceae
46.	*Hibiscus micranthus*	Verbenaceae

S.No.	Botanical Name	Family
47.	*Holarrhena pubescens*	Fabaceae
48.	*Holoptelea integrifolia*	Lamiaceae
49.	*Hybanthus enneaspermus*	Malvaceae
50.	*Hyptis suaveolens*	Rhamnaceae
51.	*Indigofera linifolia*	Rhamnaceae

Table 3.50: Community Structure for Understory (Herbaceous vegetation) in the Study area

S.No.	Botanical Name	Family
1.	*Iphigenia mysorensis*	Fabaceae
2.	*Jasminum auriculatum*	Amaranthaceae
3.	*Jatropha curcas*	Amaranthaceae
4.	*Jatropha glandulifera*	Fabaceae
5.	*Justicia glauca*	Asteraceae
6.	*Justicia procumbens*	Amaranthaceae
7.	*Knoxia sumatrensis*	Fabaceae
8.	*Kyllinga bulbosa*	Fabaceae
9.	*Lagerstroemia parviflora*	Vitaceae
10.	*Lannea coromandelica*	Combretaceae
11.	*Lantana camara*	Poaceae
12.	*Leucas aspera*	Poaceae
13.	*Limonia acidissima*	Aristolochiaceae
14.	*Madhuca longifolia var. Latifolia*	Nyctaginaceae
15.	*Miliusa tomentosa*	Malvaceae
16.	*Mitragyna parvifolia*	Malvaceae
17.	*Morinda pubescens*	Amaranthaceae
18.	*Mucuna pruriens*	Rutaceae
19.	*Orthosiphon rubicundus*	Fabaceae
20.	*Parthenium hysterophorus*	Fabaceae
21.	*Pavonia odorata*	Poaceae
22.	*Pavonia zeylanica*	Poaceae
23.	*Phoenix loureiroi*	Fabaceae
24.	*Phyllanthus amarus*	Asteraceae
25.	*Phyllanthus debilis*	Poaceae
26.	*Phyllanthus emblica*	Asteraceae
27.	*Phyllanthus maderaspatensis*	Acanthaceae
28.	*Phyllanthus reticulatus*	Poaceae
29.	*Phyllanthus virgatus*	Convolvulaceae
30.	*Plumbago zeylanica*	Cyperaceae
31.	*Polyalthia cerasoides*	Colchicaceae
32.	*Premna mollissima*	Asteraceae
33.	*Prosopis cineraria*	Amaranthaceae
34.	*Pterocarpus marsupium*	Rubiaceae
35.	*Pulicaria wightiana*	Caesalpiniaceae
36.	*Pupalia lappacea*	Poaceae
37.	*Rhynchosia minima*	Malvaceae
38.	*Rivea hypocrateriformis*	Fabaceae
39.	*Rotheca serrata*	Colchicaceae
40.	*Rungia repens*	Acanthaceae

S.No.	Botanical Name	Family
41.	*Scleria lithosperma*	Acanthaceae
42.	*Semecarpus anacardium*	Rubiaceae
43.	*Senna auriculata*	Cyperaceae
44.	*Sesamum indicum*	Lythraceae
45.	*Sida cordifolia*	Anacardiaceae
46.	*Solanum surattense*	Combretaceae
47.	*Soymida febrifuga*	Lamiaceae
48.	*Spermacoce hispida*	Sapotaceae
49.	*Spermacoce pusilla*	Lamiaceae
50.	*Sporobolus wallichii*	Asteraceae
51.	*Strychnos nux- vomica*	Malvaceae
52.	*Strychnus potatorum*	Plumbaginaceae
53.	*Syzygium cumini*	Phyllanthaceae
54.	*Tarenna asiatica*	Phyllanthaceae
55.	*Tectona grandis*	Euphorbiaceae
56.	*Tephrosia purpurea*	Annonaceae
57.	*Tephrosia spinosa*	Asteraceae
58.	*Tephrosia villosa*	Amaranthaceae
59.	*Terminalia alata*	Fabaceae
60.	*Terminalia arjuna*	Acanthaceae
61.	*Terminalia bellirica*	Cyperaceae
62.	*Terminalia chebula*	Pedaliaceae
63.	*Terminalia tomentosa*	Malvaceae
64.	*Tribulus terrestris*	Solanaceae
65.	*Trichuriella monsoniae*	Meliaceae
66.	*Triumfetta rotundifolia*	Rubiaceae
67.	*Vitex negundo*	Poaceae
68.	*Waltheria indica*	Fabaceae
69.	*Woodfordia fruticosa*	Fabaceae
70.	*Wrightia tinctoria*	Fabaceae
71.	*Xylia xylocarpa*	Combretaceae
72.	*Ziziphus oenopolia*	Zygophyllaceae
73.	*Ziziphus xylopyrus*	Amaranthaceae

3.9.11.1.4 Phyto-Sociological Assessment during Monsoon Season (August, 2019)

SAMPLE SITE-I

Phyto-sociological features of trees encountered in sample plots are given in **Table 3.51.** *Albizia odoratissima is* identified as the most dominant species with 42.88 Importance Value Index followed by *Alangium salviifolium* (35.39), *Diospyros melanoxylon* (31.64), *Acacia leucophloea* (26.56), *Aegle marmelos & Anogeissus latifolia (*22.34) each species. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and species dominance i.e., Simpson's Index (λ). For trees, Simpson's Index value is 0.10 and the Shannon Wiener Index value is 1.04.

Table 3.51: Phytosociological Attributes of Tree Species

TREES (10MX10M)		Sample Site – I: Land Area In The Environs Of Venkatadri And Kurumurthyraya And Along The Alignment In The Reservoirs								
S.No	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon - Wiener Diversity Index
1	*Xylia xylocarpa*	1.00	0.2	20	5.688	2.326	3.23	11.24	0.00	0.04
2	*Dalbergia latifolia*	1.00	0.2	20	5.688	2.326	3.23	11.24	0.00	0.04
3	*Terminalia chebula*	1.00	0.2	20	5.688	2.326	3.23	11.24	0.00	0.04
4	*Madhuca longifolia var. Latifolia*	2.00	0.4	20	11.377	4.651	3.23	19.25	0.00	0.06
5	*Pterocarpus marsupium*	1.50	0.6	40	8.532	6.977	6.45	21.96	0.00	0.08
6	*Chloroxylon swietenia*	1.50	0.6	40	8.532	6.977	6.45	21.96	0.00	0.08
7	*Wrightia tinctoria*	1.50	0.6	40	8.532	6.977	6.45	21.96	0.00	0.08
8	*Aegle marmelos*	1.00	0.6	60	5.688	6.977	9.68	22.34	0.00	0.08
9	*Anogeissus latifolia*	1.00	0.6	60	5.688	6.977	9.68	22.34	0.00	0.08
10	*Acacia leucophloea*	1.33	0.8	60	7.584	9.302	9.68	26.56	0.01	0.10
11	*Diospyros melanoxylon*	1.25	1	80	7.110	11.628	12.90	31.64	0.01	0.11
12	*Alangium salviifolium*	1.50	1.2	80	8.532	13.953	12.90	35.39	0.02	0.12
13	*Albizia odoratissima*	2.00	1.6	80	11.377	18.605	12.90	42.88	0.03	0.14
		17.58	**8.6**	**620**	**100**	**100**	**100**	**300**	**0.10**	**1.04**

Phyto-sociological features of shrubs encountered in sample plots are given in **Table 3.52**. *Bridelia montana and Grewia hirsute are* identified as the most dominant species each with 48.48 Importance Value Index followed by *Canthium coromandelicum (42.67), Abelmoschus ficulneus* (38.12), *Waltheria indica & Jasminum auriculatum* (26.87) species, etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For shrubs, Simpson's Index value is 0.14 and the Shannon Wiener Index value is 0.90.

Table 3.52: Phytosociological Attributes of Shrub Species

SHRUBS (3MX3M)		Sample Site – I: Land Area In The Environs Of Venkatadri And Kurumurthyraya And Along The Alignment In The Reservoirs								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Rivea hypocrateriformis*	1.00	0.4	40	7.380	5.405	7.69	20.48	0.00	0.07
2	*Butea superba*	2.00	0.4	20	14.760	5.405	3.85	24.01	0.00	0.07
3	*Helicteres isora*	2.00	0.4	20	14.760	5.405	3.85	24.01	0.00	0.07
4	*Waltheria indica*	1.50	0.6	40	11.070	8.108	7.69	26.87	0.01	0.09
5	*Jasminum auriculatum*	1.50	0.6	40	11.070	8.108	7.69	26.87	0.01	0.09
6	*Abelmoschus ficulneus*	1.25	1	80	9.225	13.514	15.38	38.12	0.02	0.12
7	*Canthium coromandelicum*	1.50	1.2	80	11.070	16.216	15.38	42.67	0.03	0.13
8	*Bridelia montana*	1.40	1.4	100	10.332	18.919	19.23	48.48	0.04	0.14
9	*Grewia hirsuta*	1.40	1.4	100	10.332	18.919	19.23	48.48	0.04	0.14
		13.55	**7.4**	**520**	**100**	**100**	**100**		**0.14**	**0.90**

Phyto-sociological features of herbs encountered in sample plots are given in **Table 3.53.** *Hyptis suaveolens is* identified as the most dominant species with 45.92 Importance Value Index followed by *Blepharis maderaspatensis* (44.28), *Cymbopogon citrates (38.44), Cynodon dactylon (35.26), Aristida adscensionis* (32.96) species etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For herbs, Simpson's Index value is 0.13 and the Shannon Wiener Index value is 0.94.

Table 3.53: Phytosociological Attributes of Herbaceous Species

HERBS (1MX1M)		Sample Site – I: Land Area In The Environs Of Venkatadri And Kurumurthyraya And Along The Alignment In The Reservoirs								
S.No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Evolvulus alsinoides*	1.00	0.2	20	5.435	2.381	4.00	11.82	0.00	0.039
2	*Leucas aspera*	2.00	0.4	20	10.870	4.762	4.00	19.63	0.00	0.063
3	*Tephrosia villosa*	2.00	0.4	20	10.870	4.762	4.00	19.63	0.00	0.063
4	*Eragrostiella bifaria*	1.50	0.6	40	8.152	7.143	8.00	23.30	0.01	0.082
5	*Celosia argentea*	1.33	0.8	60	7.246	9.524	12.00	28.77	0.01	0.097
6	*Aristida adscensionis*	1.67	1	60	9.058	11.905	12.00	32.96	0.01	0.110
7	*Cynodon dactylon*	4.00	0.8	20	21.739	9.524	4.00	35.26	0.01	0.097
8	*Cymbopogon citratus*	1.50	1.2	80	8.152	14.286	16.00	38.44	0.02	0.121
9	*Blepharis maderaspatensis*	1.40	1.4	100	7.609	16.667	20.00	44.28	0.03	0.130
10	*Hyptis suaveolens*	2.00	1.6	80	10.870	19.048	16.00	45.92	0.04	0.137
		18.40	**8.4**	**500**	**100**	**100**	**100**	**300**	**0.13**	**0.939**

SAMPLE SITE - II

Phyto-sociological features of trees encountered in sample plots are given in **Table 3.54**. *Diospyros melanoxylon is* identified as the most dominant species with 35.12 Importance Value Index followed by *Buchanania cochinchinensis* (27.05), *Tectona grandis* & *Chloroxylon swietenia* (21.17) each, *Cassia fistula* (21.07), *Madhuca longifolia* var. *latifolia (17.*99) species, etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For trees, Simpson's Index value is 0.08 and the Shannon Wiener Index value is 1.18.

Table 3.54: Phytosociological Attributes of Tree Species

Trees (10mx10m)		Sample Site – II: Land Area In The Environs Of Udandpur & K.P. Laksmidevipalle Reservoirs And Land Area Along The Alignment In The Reservoirs								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Bauhinia racemosa*	1.00	0.2	20	3.287	1.538	2.632	7.46	0.00	0.028
2	*Lagerstroemia parviflora*	1.00	0.2	20	3.287	1.538	2.632	7.46	0.00	0.028
3	*Syzygium cumini*	2.00	0.4	20	6.575	3.077	2.632	12.28	0.00	0.047
4	*Wrightia tinctoria*	2.00	0.4	20	6.575	3.077	2.632	12.28	0.00	0.047
5	*Terminalia bellirica*	2.00	0.4	20	6.575	3.077	2.632	12.28	0.00	0.047
6	*Soymida febrifuga*	1.50	0.6	40	4.931	4.615	5.263	14.81	0.00	0.062
7	*Terminalia arjuna*	1.50	0.6	40	4.931	4.615	5.263	14.81	0.00	0.062
8	*Cleistanthus collinus*	1.50	0.6	40	4.931	4.615	5.263	14.81	0.00	0.062
9	*Azadirachta indica*	1.50	0.6	40	4.931	4.615	5.263	14.81	0.00	0.062

Trees (10mx10m)		Sample Site – II: Land Area In The Environs Of Udandpur & K.P. Laksmidevipalle Reservoirs And Land Area Along The Alignment In The Reservoirs								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
10	*Strychnos nux-vomica*	1.50	0.6	40	4.931	4.615	5.263	14.81	0.00	0.062
11	*Holarrhena pubescens*	1.50	0.6	40	4.931	4.615	5.263	14.81	0.00	0.062
12	*Anogeissus latifolia*	1.00	0.6	60	3.287	4.615	7.895	15.80	0.00	0.062
13	*Madhuca longifolia var. Latifolia*	2.00	0.8	40	6.575	6.154	5.263	17.99	0.00	0.075
14	*Cassia fistula*	1.67	1	60	5.479	7.692	7.895	21.07	0.01	0.086
15	*Tectona grandis*	2.50	1	40	8.218	7.692	5.263	21.17	0.01	0.086
16	*Chloroxylon swietenia*	2.50	1	40	8.218	7.692	5.263	21.17	0.01	0.086
17	*Buchanania cochinchinensis*	1.75	1.4	80	5.753	10.769	10.526	27.05	0.01	0.104
18	*Diospyros melanoxylon*	2.00	2	100	6.575	15.385	13.158	35.12	0.02	0.125
		30.42	**13**	**760**	**100**	**100**	**100**	**300**	**0.08**	**1.188**

Phyto-sociological features of shrubs encountered in sample plots are given in **Table 3.55**. *Senna auriculata is* identified as the most dominant species with 46.20 Importance Value Index followed by *Getonia floribunda (41.93), Gymnosporia emarginata* (38.49), *Phyllanthus reticulatus* (33.25), *Ziziphus oenopolia, Helicteres isora & Breynia vitis-idaea* (23.66) each species etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For shrubs, Simpson's Index value is 0.12 and the Shannon Wiener Index value is 0.97.

Table 3.55: Phytosociological Attributes of Shrub Species

SHRUBS (3MX3M)		Sample Site – II: Land Area In The Environs Of Udandpur & K.P. Laksmidevipalle Reservoirs And Land Area Along The Alignment In The Reservoirs								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Lantana camara*	1.00	0.2	20	5.882	2.381	3.846	12.11	0.00	0.04
2	*Abutilon indicum*	1.00	0.4	40	5.882	4.762	7.692	18.34	0.00	0.06
3	*Canthium coromandelicum*	1.00	0.4	40	5.882	4.762	7.692	18.34	0.00	0.06
4	*Catunaregam spinosa*	2.00	0.4	20	11.765	4.762	3.846	20.37	0.00	0.06
5	*Ziziphus oenopolia*	1.50	0.6	40	8.824	7.143	7.692	23.66	0.01	0.08
6	*Helicteres isora*	1.50	0.6	40	8.824	7.143	7.692	23.66	0.01	0.08
7	*Breynia vitis- idaea*	1.50	0.6	40	8.824	7.143	7.692	23.66	0.01	0.08
8	*Phyllanthus reticulatus*	1.67	1	60	9.804	11.905	11.538	33.25	0.01	0.11
9	*Gymnosporia emarginata*	1.50	1.2	80	8.824	14.286	15.385	38.49	0.02	0.12
10	*Getonia floribunda*	2.33	1.4	60	13.725	16.667	11.538	41.93	0.03	0.13
11	*Senna auriculata*	2.00	1.6	80	11.765	19.048	15.385	46.20	0.04	0.14
		17.00	**8.4**	**520**	**100**	**100**	**100**	**300**	**0.12**	**0.97**

Phyto-sociological features of herbs encountered in sample plots are given in Table 3.56 *Sida cordifolia is* identified as the most dominant species with 36.88 Importance Value Index followed by *Tephrosia purpurea* & *Aristida setacea* (31.32), *Cymbopogon citrates & Hyptis suaveolens (*31.16) species, etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H')

and dominance i.e. Simpson's Index (λ). For herbs, Simpson's Index value is 0.10 and the Shannon Wiener Index value is 1.04.

Table 3.56: Phytosociological Attributes of Herbaceous Species

HERBS (1MX1M)		Sample Site – II: Land Area In The Environs Of Udandpur & K.P. Laksmidevipalle Reservoirs And Land Area Along The Alignment In The Reservoirs								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Solanum surattense*	1.00	0.2	20	4.61	2.326	4.000	10.94	0.00	0.04
2	*Cyanthillium cinereum*	1.00	0.4	40	4.61	4.651	8.000	17.27	0.00	0.06
3	*Indigofera linifolia*	2.00	0.4	20	9.23	4.651	4.000	17.88	0.00	0.06
4	*Pavonia zeylanica*	2.00	0.4	20	9.25	4.651	4.000	17.88	0.00	0.06
5	*Blepharis maderaspatensis*	1.50	0.6	40	6.92	6.977	8.000	21.90	0.00	0.08
6	*Parthenium hysterophorus*	3.00	0.6	20	13.84	6.977	4.000	24.82	0.00	0.08
7	*Rhynchosia minima*	1.33	0.8	60	6.15	9.302	12.000	27.46	0.01	0.10
8	*Cymbopogon citratus*	2.50	1	40	11.54	11.628	8.000	31.16	0.01	0.11
9	*Hyptis suaveolens*	2.50	1	40	11.54	11.628	8.000	31.16	0.01	0.11
10	*Tephrosia purpurea*	1.67	1	60	7.69	11.628	12.000	31.32	0.01	0.11
11	*Aristida setacea*	1.67	1	60	7.69	11.628	12.000	31.32	0.01	0.11
12	*Sida cordifolia*	1.50	1.2	80	6.92	13.953	16.000	36.88	0.02	0.12
		21.67	**8.6**	**500**	**100**	**100**	**100**	**300**	**0.10**	**1.04**

SAMPLE SITE-3 (S-3)

Phyto-sociological features of trees encountered in sample plots are given in Table 3.57. *Chloroxylon swietenia is* identified as the most dominant species with 44.85 Importance Value Index followed by *Butea monosperma* (32.39), *Mitragyna parvifolia & Wrightia tinctoria* (27.13), *Terminalia alata* (27.01), *Albizia amara & Terminalia arjuna* (22.07) species, etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For trees, Simpson's Index value is 0.10 and the Shannon Wiener Index value is 1.05.

Table 3.57: Phytosociological Attributes of Tree Species

TREES (10MX10M)		Sample Site – III: Command/Ayacut Area In The Left HAND SIDE of THE ALIGNMENT IN NW DIRECTION								
S.N.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Ficus hispida*	1.00	0.2	20	5.353	2.381	3.448	11.18	0.00	0.039
2	*Acacia leucophloea*	1.00	0.2	20	5.353	2.381	3.448	11.18	0.00	0.039
3	*Haldina cordifolia*	1.00	0.4	40	5.353	4.762	6.897	17.01	0.00	0.063
4	*Xylia xylocarpa*	1.00	0.4	40	5.353	4.762	6.897	17.01	0.00	0.063
5	*Phyllanthus emblica*	2.00	0.4	20	10.707	4.762	3.448	18.92	0.00	0.063
6	*Albizia amara*	1.50	0.6	40	8.030	7.143	6.897	22.07	0.01	0.082
7	*Terminalia arjuna*	1.50	0.6	40	8.030	7.143	6.897	22.07	0.01	0.082
8	*Prosopis cineraria*	1.50	0.6	40	8.030	7.143	6.897	22.07	0.01	0.082
9	*Terminalia alata*	1.33	0.8	60	7.138	9.524	10.345	27.01	0.01	0.097
10	*Mitragyna parvifolia*	2.00	0.8	40	10.707	9.524	6.897	27.13	0.01	0.097

TREES (10MX10M)		Sample Site – III: Command/Ayacut Area In The Left HAND SIDE of THE ALIGNMENT IN NW DIRECTION								
S.N.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
11	*Wrightia tinctoria*	2.00	0.8	40	10.707	9.524	6.897	27.13	0.01	0.097
12	*Butea monosperma*	1.25	1	80	6.692	11.905	13.793	32.39	0.01	0.110
13	*Chloroxylon swietenia*	1.60	1.6	100	8.565	19.048	17.241	44.85	0.04	0.137
		18.68	**8.4**	**580**	**100**	**100**	**100**	**300**	**0.10**	**1.051**

Phyto-sociological features of shrubs encountered in sample plots are given in Table 3.58 *Catunaregam spinosa* is identified as the most dominant species with 49.82 Importance Value Index followed by *Holarrhena pubescens* (39.19), *Gymnosporia emarginata* (38.83), *Helicteres isora (33.92), Ziziphus xylopyrus,* & *Erythroxylum monogynum* (33.26), etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For shrubs, Simpson's Index value is 0.13 and the Shannon Wiener Index value is 0.93.

Table 3.58: Phytosociological Attributes of Shrub Species

SHRUBS (3MX3M)		Sample Site – III Command/Ayacut Area In The Left-Hand Side Of The Alignment In Nw Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Calotropis gigantea*	1.00	0.2	20	6.154	2.857	4.762	13.77	0.00	0.04
2	*Dichrostachys cinerea*	1.00	0.2	20	6.154	2.857	4.762	13.77	0.00	0.04
3	*Carissa spinarum*	1.00	0.4	40	6.154	5.714	9.524	21.39	0.00	0.07
4	*Calotropis procera*	2.00	0.4	20	12.308	5.714	4.762	22.78	0.00	0.07
5	*Ziziphus xylopyrus*	2.00	0.8	40	12.308	11.429	9.524	33.26	0.01	0.11
6	*Erythroxylum monogynum*	2.00	0.8	40	12.308	11.429	9.524	33.26	0.01	0.11
7	*Helicteres isora*	1.33	0.8	60	8.205	11.429	14.286	33.92	0.01	0.11
8	*Gymnosporia emarginata*	1.67	1	60	10.256	14.286	14.286	38.83	0.02	0.12
9	*Holarrhena pubescens*	2.50	1	40	15.385	14.286	9.524	39.19	0.02	0.12
10	*Catunaregam spinosa*	1.75	1.4	80	10.769	20.000	19.048	49.82	0.04	0.14
		16.25	**7**	**420**	**100**	**100**	**100**	**300**	**0.13**	**0.93**

Phyto-sociological features of herbs encountered in sample plots are given in Table 3.59. *Aristida setacea is* identified as the most dominant species with 30.05 Importance Value Index followed by *Heteropogon contortus, Hybanthus enneaspermus, Hyptis suaveolens* & *Apluda mutica* (25.92), *Hemidesmus indicus (21.78), Solanum surattense & Amaranthus spinosus* (21.29) species, etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For herbs, Simpson's Index value is 0.08 and the Shannon Wiener Index value is 1.12.

Table 3.59: Phytosociological Attributes of Herbaceous Species

HERBS (1MX1M)		Sample Site – III: Command/Ayacut Area In The Left-Hand Side Of The Alignment In Nw Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index

1	*Achyranthes aspera*	1.00	0.4	40	5.263	4.762	6.250	16.28	0.00	0.06
2	*Aerva lanata*	1.00	0.4	40	5.263	4.762	6.250	16.28	0.00	0.06
3	*Euphorbia hirta*	1.00	0.4	40	5.263	4.762	6.250	16.28	0.00	0.06
4	*Boerhavia diffusa*	1.00	0.4	40	5.263	4.762	6.250	16.28	0.00	0.06
5	*Andrographis paniculata*	2.00	0.4	20	10.526	4.762	3.125	18.41	0.00	0.06
6	*Sida cordifolia*	2.00	0.4	20	10.526	4.762	3.125	18.41	0.00	0.06
7	*Solanum surattense*	1.50	0.6	40	7.895	7.143	6.250	21.29	0.01	0.08
8	*Amaranthus spinosus*	1.50	0.6	40	7.895	7.143	6.250	21.29	0.01	0.08
9	*Hemidesmus indicus*	1.00	0.6	60	5.263	7.143	9.375	21.78	0.01	0.08
10	*Heteropogon contortus*	1.33	0.8	60	7.018	9.524	9.375	25.92	0.01	0.10
11	*Hybanthus enneaspermus*	1.33	0.8	60	7.018	9.524	9.375	25.92	0.01	0.10
12	*Hyptis suaveolens*	1.33	0.8	60	7.018	9.524	9.375	25.92	0.01	0.10
13	*Apluda mutica*	1.33	0.8	60	7.018	9.524	9.375	25.92	0.01	0.10
14	*Aristida setacea*	1.67	1	60	8.772	11.905	9.375	30.05	0.01	0.11
		19.00	**8.4**	**640**	**100**	**100**	**100**	**300**	**0.08**	**1.12**

SAMPLE SITE-4 (S-4)

Phyto-sociological features of trees encountered in sample plots are given in Table 3.60. *Wrightia tinctoria is* identified as the most dominant species with 40.10 Importance Value Index followed by *Diospyros melanoxylon* (32.45), *Strychnus potatorum* (30.42), *Tarenna asiatica* (29.21), species, etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominancei.e. Simpson's Index (λ). For trees, Simpson's Index value is 0.10 and the Shannon Wiener Index value is 1.03.

Table 3.60: Phytosociological Attributes of Tree Species

TREES(10MX10M)		Sample Site – I V: Command/Ayacut Area In The Right Hand Side Of The Alignment In Ne Direction								
S. No.	**Name of the species**	**A**	**D**	**F**	**RA**	**RD**	**RF**	**IVI**	**Simpson's Dominance index**	**Shannon-Wiener Diversity Index**
1	*Anogeisus latifolia*	1.00	0.2	20	4.744	2.04	3.57	10.36	0.00	0.03
2	*Bauhinia racemosa*	2.00	0.4	20	9.488	4.08	3.57	17.14	0.00	0.06
3	*Semecarpus anacardium*	2.00	0.4	20	9.488	4.08	3.57	17.14	0.00	0.06
4	*Terminalia arjuna*	1.50	0.6	40	7.116	6.12	7.14	20.38	0.00	0.07
5	*Albizia lebeck*	1.50	0.6	40	7.116	6.12	7.14	20.38	0.00	0.07
6	*Lagerstroemia parviflora*	2.00	0.8	40	9.488	8.16	7.14	24.79	0.01	0.09
7	*Pterocarpus marsupium*	1.67	1	60	7.906	10.20	10.71	28.82	0.01	0.10
8	*Ceiba pentandra*	1.67	1	60	7.906	10.20	10.71	28.82	0.01	0.10
9	*Tarenna asiatica*	2.50	1	40	11.860	10.20	7.14	29.21	0.01	0.10
10	*Strychnus potatorum*	1.25	1	80	5.930	10.20	14.29	30.42	0.01	0.10
11	*Diospyros melanoxylon*	2.00	1.2	60	9.488	12.24	10.71	32.45	0.01	0.11
12	*Wrightia tinctoria*	2.00	1.6	80	9.488	16.33	14.29	40.10	0.03	0.13
		21.08	**9.8**	**560**	**100.016**	**100.00**	**100.00**	**300**	**0.10**	**1.03**

Phyto-sociological features of shrubs encountered in sample plots are given in Table 3.61. *Getonia floribunda is* identified as the most dominant species with 48.39 Importance Value Index followed by *Dodonaea viscosa* (47.52), *Cleistanthus collinus, Catunaregam spinosa* & *Grewia hirsuta* (41.98), *Canthium coromandelicum* (36.44), etc. There are two important indices to denote the diversity i.e.,

Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For shrubs, Simpson's Index value is 0.15 and the Shannon Wiener Index value is 0.86.

Table 3.61: Phytosociological Attributes of Shrub Species

HRUBS (3MX3M)		Sample Site – IV: Command/Ayacut Area In The Right Hand Side Of The Alignment In Ne Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Dichrostachys cinerea*	1.00	0.2	20	7.79	2.94	4.76	15.50	0.00	0.05
2	*Jatropha glandulifera*	2.00	0.4	20	15.59	5.88	4.76	26.23	0.00	0.07
3	*Canthium coromandelicum*	1.33	0.8	60	10.39	11.76	14.29	36.44	0.01	0.11
4	*Cleistanthus collinus*	1.67	1	60	12.99	14.71	14.29	41.98	0.02	0.12
5	*Catunaregam spinosa*	1.67	1	60	12.99	14.71	14.29	41.98	0.02	0.12
6	*Grewia hirsuta*	1.67	1	60	12.99	14.71	14.29	41.98	0.02	0.12
7	*Dodonaea viscosa*	2.00	1.2	60	15.59	17.65	14.29	47.52	0.03	0.13
8	*Getonia floribunda*	1.50	1.2	80	11.69	17.65	19.05	48.39	0.03	0.13
		12.83	**6.8**	**420**	**100**	**100**	**100**	**300**	**0.15**	**0.86**

3.9.11.1.5 Phyto-Sociological Assessment during Post-Monsson Season (November, 2019)

SAMPLE SITE-1 (S-1)

Phyto-sociological features of trees encountered in sample plots are given in Table 3.62. *Chloroxylon swietenia* is identified as the most dominant species with 28.81 Importance Value Index followed by *Terminalia alata* (28.29), *Lannea coromandelica* (26.68), *Anogeissus latifolia* (22.43), *Tectona grandis* & *Madhuca longifolia* var. *latifolia* (21.63), *Hardwickia binata* & *Lagerstroemia parviflora* 18.20 each species. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and species dominance i.e. Simpson's Index (λ). Simpson's Index values of 0.075 for trees and the Shannon Wiener Index value of 1.16 for trees.

Table 3.62: Phytosociological Attributes of Tree Species

TREES (10MX10M)		Sample Site – I: Land Area In The Environs Of Venkatadri And Kurumurthyraya And Along The Alignment In The Reservoirs								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Lannea coromandelica*	2.67	1.6	60	6.48	10.53	9.68	26.68	0.011	0.10
2	*Terminalia alata*	2.00	1.6	80	4.86	10.53	12.90	28.29	0.011	0.10
3	*Chloroxylon swietenia*	3.00	1.8	60	7.29	11.84	9.68	28.81	0.014	0.11
4	*Tectona grandis*	3.00	1.2	40	7.29	7.89	6.45	21.63	0.006	0.09
5	*Madhuca longifolia var. latifolia*	3.00	1.2	40	7.29	7.89	6.45	21.63	0.006	0.09
6	*Polyalthia cerasoides*	2.00	0.4	20	4.86	2.63	3.23	10.72	0.001	0.04
7	*Haldina cordifolia*	2.00	0.4	20	4.86	2.63	3.23	10.72	0.001	0.04
8	*Bombax ceiba*	1.50	0.6	40	3.64	3.95	6.45	14.04	0.002	0.06
9	*Limonia acidissima*	3.00	0.6	20	7.29	3.95	3.23	14.46	0.002	0.06
10	*Ziziphus xylopyrus*	3.00	0.6	20	7.29	3.95	3.23	14.46	0.002	0.06
11	*Acacia leucophloea*	2.00	0.8	40	4.86	5.26	6.45	16.57	0.003	0.07

TREES (10MX10M)		Sample Site – I: Land Area In The Environs Of Venkatadri And Kurumurthyraya And Along The Alignment In The Reservoirs								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
12	*Dalbergia lanceolaria subsp. paniculata*	2.00	0.8	40	4.86	5.26	6.45	16.57	0.003	0.07
13	*Soymida febrifuga*	2.00	0.8	40	4.86	5.26	6.45	16.57	0.003	0.07
14	*Lagerstroemia parviflora*	4.00	0.8	20	9.72	5.26	3.23	18.20	0.003	0.07
15	*Hardwickia binata*	4.00	0.8	20	9.72	5.26	3.23	18.20	0.003	0.07
16	*Anogeissus latifolia*	2.00	1.2	60	4.86	7.89	9.68	22.43	0.006	0.09
		41.17	**15.2**	**620**	**99.99**	**100**	**100**	**300**	**0.075**	**1.16**

Phyto-sociological features of shrubs encountered in sample plots are given in Table 3.63 *Grewia 6hirsute and Bridelia montana are* identified as the most dominant species each with 40.79 Importance Value Index followed by *Argyreia nervosa* (35.63), *Cocculus hirsutus* (34.88), *Holarrhena pubescens* (33.24), etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and species dominance i.e. Simpson's Index (λ). Simpson's Index values of 0.117 for shrubs and the Shannon Wiener Index value of 0.94 for shrubs.

Table 3.63: Phytosociological Attributes of Shrub Species

SHRUBS (3MX3M)		Sample Site – I: Land Area In The Environs Of Venkatadri And Kurumurthyraya And Along The Alignment In The Reservoirs								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Abrus precatorius*	1.50	0.6	40	9.57	9.09	10.00	28.66	0.008	0.09
2	*Acacia intsia*	1.50	0.6	40	9.57	9.09	10.00	28.66	0.008	0.09
3	*Dioscorea pentaphylla*	1.50	0.6	40	9.57	9.09	10.00	28.66	0.008	0.09
4	*Gardenia gummifera*	1.50	0.6	40	9.57	9.09	10.00	28.66	0.008	0.09
5	*Holarrhena pubescens*	3.00	0.6	20	19.16	9.09	5.00	33.24	0.008	0.09
6	*Cocculus hirsutus*	2.00	0.8	40	12.76	12.12	10.00	34.88	0.015	0.11
7	*Argyreia nervosa*	1.33	0.8	60	8.51	12.12	15.00	35.63	0.015	0.11
8	*Grewia hirsuta*	1.67	1	60	10.64	15.15	15.00	40.79	0.023	0.12
9	*Bridelia montana*	1.67	1	60	10.64	15.15	15.00	40.79	0.023	0.12
		15.67	**6.6**	**400**	**100**	**100**	**100**	**300**	**0.117**	**0.94**

Phyto-sociological features of herbs encountered in sample plots are given in Table 3.64 *Byttneria herbacea is* identified as the most dominant species with 28.67 Importance Value Index followed by *Cyperus clarkei* (26.98), *Sporobolus wallichii* & *Ageratum conyzoides* (26.50) each, *Scleria lithosperma* (21.75), etc. There are two important indices to denote the diversity Simpson's Index values of 0.077 for herbs and the Shannon Wiener Index value of 1.15 for Herbs.

Table 3.64: Phytosociological Attributes of Herbaceous Species

HERBS (1MX1M)	Sample Site – I: Land Area In The Environs Of Venkatadri And Kurumurthyraya And ALONG THE ALIGNMENT IN THE RESERVOIRS

S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Aeschynomene aspera*	1.67	1	60	4.39	6.49	9.09	19.97	0.004	0.08
2	*Ageratum conyzoides*	2.67	1.6	60	7.02	10.39	9.09	26.50	0.011	0.10
3	*Alysicarpus vaginalis*	1.33	0.8	60	3.51	5.19	9.09	17.79	0.003	0.07
4	*Tephrosia spinosa*	1.67	1	60	4.39	6.49	9.09	19.97	0.004	0.08
5	*Sporobolus wallichii*	2.67	1.6	60	7.02	10.39	9.09	26.50	0.011	0.10
6	*Byttneria herbacea*	3.00	1.8	60	7.89	11.69	9.09	28.67	0.014	0.11
7	*Scleria lithosperma*	3.00	1.2	40	7.89	7.79	6.06	21.75	0.006	0.09
8	*Phyllanthus debilis*	4.00	0.8	20	10.53	5.19	3.03	18.75	0.003	0.07
9	*Cyperus clarkei*	4.00	1.6	40	10.53	10.39	6.06	26.98	0.011	0.10
10	*Crotalaria medicaginea*	2.00	0.4	20	5.26	2.60	3.03	10.89	0.001	0.04
11	*Cyanthillium cinereum*	2.00	0.4	20	5.26	2.60	3.03	10.89	0.001	0.04
12	*Heteropogon contortus*	2.00	0.4	20	5.26	2.60	3.03	10.89	0.001	0.04
13	*Justicia glauca*	2.00	0.4	20	5.26	2.60	3.03	10.89	0.001	0.04
14	*Orthosiphon rubicundus*	2.00	0.8	40	5.26	5.19	6.06	16.52	0.003	0.07
15	*Triumfetta rotundifolia*	2.00	0.8	40	5.26	5.19	6.06	16.52	0.003	0.07
16	*Blepharis maderaspatensis*	2.00	0.8	40	5.26	5.19	6.06	16.52	0.003	0.07
		38.00	**15.4**	**660**	**100**	**100**	**100**	**300**	**0.077**	**1.15**

SAMPLE SITE-2 (S-2)

Phyto-sociological features of trees encountered in sample plots are given in Table 3.65. *Tectona grandis and Diospyros melanoxylon are* identified as the most dominant species each with 23.83 Importance Value Index followed by *Acacia leucophloea* (21.84), *Anogeissus latifolia*, *Buchanania cochinchinensis & Lagerstroemia parviflora* (17.86) each, *Lannea coromandelica, Holarrhena pubescens& Wrightia tinctoria* (16.66) each etc. There are two important indices to denote the diversity Simpson's Index values of 0.06 for trees and the Shannon Wiener Index value of 1.24 for trees.

Table 3.65: Phytosociological Attributes of Tree Species

Trees (10mx10m)		Sample Site – II: Land Area In The Environs Of Udandpur & K.P. Laksmidevipalle Reservoirs And Land Area Along The Alignment In The Reservoirs								
S. No.	ame of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Chloroxylon swietenia*	2.00	0.4	20	4.55	2.47	2.63	9.65	0.001	-0.04
2	*Cleistanthus collinus*	2.00	0.4	20	4.55	2.47	2.63	9.65	0.001	-0.04
3	*Grewia tiliifolia*	2.00	0.4	20	4.55	2.47	2.63	9.65	0.001	-0.04
4	*Soymida febrifuga*	1.50	0.6	40	3.41	3.70	5.26	12.38	0.001	0.05
5	*Madhuca longifolia var. latifolia*	1.50	0.6	40	3.41	3.70	5.26	12.38	0.001	0.05
6	*Gardenia latifolia*	3.00	0.6	20	6.82	3.70	2.63	13.15	0.001	0.05
7	*Terminalia alata*	2.00	0.8	40	4.55	4.94	5.26	14.75	0.002	0.06
8	*Dalbergia latifolia*	2.00	0.8	40	4.55	4.94	5.26	14.75	0.002	0.06
9	*Mitragyna parvifolia*	2.00	0.8	40	4.55	4.94	5.26	14.75	0.002	0.06
10	*Terminalia bellirica*	1.33	0.8	60	3.03	4.94	7.89	15.86	0.002	0.06
11	*Lannea coromandelica*	4.00	0.8	20	9.09	4.94	2.63	16.66	0.002	0.06
12	*Holarrhena pubescens*	4.00	0.8	20	9.09	4.94	2.63	16.66	0.002	0.06
13	*Wrightia tinctoria*	4.00	0.8	20	9.09	4.94	2.63	16.66	0.002	0.06
14	*Anogeissus latifolia*	1.67	1	60	3.79	6.17	7.89	17.86	0.004	0.07

Trees (10mx10m)		Sample Site – II: Land Area In The Environs Of Udandpur & K.P. Laksmidevipalle Reservoirs And Land Area Along The Alignment In The Reservoirs								
S. No.	ame of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
15	*Buchanania cochinchinensis*	1.67	1	60	3.79	6.17	7.89	17.86	0.004	0.07
16	*Lagerstroemia parviflora*	1.67	1	60	3.79	6.17	7.89	17.86	0.004	0.07
17	*Acacia leucophloea*	2.33	1.4	60	5.30	8.64	7.89	21.84	0.007	0.09
18	*Tectona grandis*	2.67	1.6	60	6.06	9.88	7.89	23.83	0.010	0.10
19	*Diospyros melanoxylon*	2.67	1.6	60	6.06	9.88	7.89	23.83	0.010	0.10
		44.00	**16**	**760**	**100**	**100**	**100**	**300**	**0.06**	**1.24**

Phyto-sociological features of shrubs encountered in sample plots are given in Table 3.66. *Waltheria indica* is identified as the most dominant species with 44.60 Importance Value Index followed by *Canthium coromandelicum (36.45), Helicteres isora* (32.38), *Ampelocissus latifolia* (28.30), *Hemidesmus indicus* (33.24), etc. There are two important indices to denote the diversity Simpson's Index values of 0.11 for shrubs and the Shannon Wiener Index value of 1.01 for shrubs.

Table 3.66: Phytosociological Attributes of Shrub Species

SHRUBS (3MX3M)		Sample Site – Ii: Land Area in The Environs of Udandpur & K.P. Laksmidevipalle Reservoirs And Land Area Along The Alignment In The Reservoirs								
S.N.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Lantana camara*	1.00	0.2	20	5.08	2.38	4.00	11.46	0.00	0.04
2	*Plumbago zeylanica*	1.00	0.2	20	5.08	2.38	4.00	11.46	0.00	0.04
3	*Butea superba*	1.00	0.4	40	5.08	4.76	8.00	17.85	0.00	0.06
4	*Breynia vitis-idaea*	1.50	0.6	40	7.63	7.14	8.00	22.77	0.01	0.08
5	*Gymnosporia emarginata*	1.50	0.6	40	7.63	7.14	8.00	22.77	0.01	0.08
6	*Woodfordia fruticosa*	1.50	0.6	40	7.63	7.14	8.00	22.77	0.01	0.08
7	*Rivea hypocrateriformis*	1.50	0.6	40	7.63	7.14	8.00	22.77	0.01	0.08
8	*Hemidesmus indicus*	3.00	0.6	20	15.25	7.14	4.00	26.39	0.01	0.08
9	*Ampelocissus latifolia*	1.33	0.8	60	6.78	9.52	12.00	28.30	0.01	0.10
10	*Helicteres isora*	1.67	1	60	8.47	11.90	12.00	32.38	0.01	0.11
11	*Canthium coromandelicum*	2.00	1.2	60	10.17	14.29	12.00	36.45	0.02	0.12
12	*Waltheria indica*	2.67	1.6	60	13.56	19.05	12.00	44.60	0.04	0.14
		19.67	**8.4**	**500**	**100**	**100**	**100**	**300**	**0.11**	**1.01**

Phyto-sociological features of herbs encountered in sample plots are given in Table 3.67 *Spermacoce hispida is* identified as the most dominant species with 35.62 Importance Value Index followed by *Heteropogon contortus* (31.19), *Pulicaria wightiana* (29.93), etc. There are two important indices to denote the diversity Simpson's Index values of 0.09 for herbs and the Shannon Wiener Index value of1.09 for Herbs.

Table 3.67: Phytosociological attributes of Herbaceous species

HERBS (1MX1M)		Sample Site – II: Land Area In The Environs Of Udandpur & K.P. Laksmidevipalle Reservoirs And Land Area Along The Alignment In The Reservoirs								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Byttneria herbacea*	1.00	0.2	20	3.54	1.67	3.33	8.54	0.00	0.03

HERBS (1MX1M)		Sample Site – II: Land Area In The Environs Of Udandpur & K.P. Laksmidevipalle Reservoirs And Land Area Along The Alignment In The Reservoirs								
S. No.	**Name of the species**	**A**	**D**	**F**	**RA**	**RD**	**RF**	**IVI**	**Simpson's Dominance index**	**Shannon-Wiener Diversity Index**
2	*Pavonia odorata*	1.00	0.2	20	3.54	1.67	3.33	8.54	0.00	0.03
3	*Triumfetta rotundifolia*	1.00	0.2	20	3.54	1.67	3.33	8.54	0.00	0.03
4	*Rhynchosia minima*	2.00	0.4	20	7.08	3.33	3.33	13.75	0.00	0.05
5	*Apluda mutica*	2.00	0.4	20	7.08	3.33	3.33	13.75	0.00	0.05
6	*Indigofera linifolia*	2.00	0.4	20	7.08	3.33	3.33	13.75	0.00	0.05
7	*Allmania nodiflora*	1.50	0.6	40	5.31	5.00	6.67	16.98	0.00	0.07
8	*Fimbristylis cymosa*	2.00	0.8	40	7.08	6.67	6.67	20.41	0.00	0.08
9	*Orthosiphon rubicundus*	2.00	0.8	40	7.08	6.67	6.67	20.41	0.00	0.08
10	*Hybanthus enneaspermus*	1.67	1	60	5.90	8.33	10.00	24.23	0.01	0.09
11	*Phyllanthus virgatus*	2.00	1.2	60	7.08	10.00	10.00	27.08	0.01	0.10
12	*Kyllinga bulbosa*	3.00	1.2	40	10.62	10.00	6.67	27.29	0.01	0.10
13	*Pulicaria wightiana*	2.33	1.4	60	8.26	11.67	10.00	29.93	0.01	0.11
14	*Heteropogon contortus*	1.75	1.4	80	6.19	11.67	13.33	31.19	0.01	0.11
15	*Spermacoce hispida*	3.00	1.8	60	10.62	15.00	10.00	35.62	0.02	0.12
		28.25	**12**	**600**	**100**	**100**	**100**		**0.09**	**1.09**

SAMPLE SITE-3 (S-3)

Phyto-sociological features of trees encountered in sample plots are given in Table 3.68. *Diospyros chloroxylon* is identified as the most dominant species with 31.08 Importance Value Index followed by *Annona squamosa* (28.30), *Alangium salviifolium* & *Wrightia tinctoria* (25.52) each, *Ziziphus xylopyrus* (23.06), *Acacia leucophloea & Grewia flavescens 22*.73 each species. There are two important indices to denote the diversity Simpson's Index values of 0.082 for trees and the Shannon Wiener Index value of 1.12 for trees.

Table 3.68: Phytosociological attributes of Tree species

Trees (10mx10m)		SAMPLE SITE – III: Command/Ayacut Area In The Left Hand Side Of The Alignment In NW Direction								
S. No.	**Name of the species**	**A**	**D**	**F**	**RA**	**RD**	**RF**	**IVI**	**Simpson's Dominance index**	**Shannon-Wiener Diversity Index**
1	*Holoptelea integrifolia*	1.00	0.2	20	3.66	1.56	2.94	8.16	0.000	0.03
2	*Xylia xylocarpa*	1.00	0.4	40	3.66	3.13	5.88	12.67	0.001	0.05
3	*Morinda pubescens*	2.00	0.4	20	7.32	3.13	2.94	13.38	0.001	0.05
4	*Azadirachta indica*	2.00	0.4	20	7.31	3.13	2.94	13.38	0.001	0.05
5	*Miliusa tomentosa*	1.50	0.6	40	5.49	4.69	5.88	16.06	0.002	0.06
6	*Buchanania cochinchinensis*	1.50	0.6	40	5.49	4.69	5.88	16.06	0.002	0.06
7	*Cassia fistula*	2.00	0.8	40	7.32	6.25	5.88	19.45	0.004	0.08
8	*Diospyros melanoxylon*	2.00	0.8	40	7.32	6.25	5.88	19.45	0.004	0.08
9	*Acacia leucophloea*	1.67	1	60	6.10	7.81	8.82	22.73	0.006	0.09
10	*Grewia flavescens*	1.67	1	60	6.10	7.81	8.82	22.73	0.006	0.09
11	*Ziziphus xylopyrus*	2.00	1.2	60	4.86	9.38	8.82	23.06	0.009	0.10

Trees (10mx10m)		SAMPLE SITE – III: Command/Ayacut Area In The Left Hand Side Of The Alignment In NW Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
12	*Wrightia tinctoria*	2.00	1.2	60	7.32	9.38	8.82	25.52	0.009	0.10
13	*Alangium salviifolium*	2.00	1.2	60	7.32	9.38	8.82	25.52	0.009	0.10
14	*Annona squamosa*	2.33	1.4	60	8.54	10.94	8.82	28.30	0.012	0.11
15	*Diospyros chloroxylon*	2.67	1.6	60	9.76	12.50	8.82	31.08	0.016	0.11
		27.33	**13**	**680**	**100**	**100**	**100**	**300**	**0.082**	**1.12**

Phyto-sociological features of shrubs encountered in sample plots are given in Table 3.69. *Grewia hirsute is* identified as the most dominant species with 41.12 Importance Value Index followed by *Waltheria indica* (33.21), *Pavonia zeylanica* (29.46), *Holarrhena pubescens, Cajanus scarabaeoides, & Dodonaea viscose* (25.29) each species. There are two important indices to denote the diversity Simpson's Index values of 0.098 for shrubs and the Shannon Wiener Index value of 1.06 for shrubs.

Table 3.69: Phytosociological attributes of Shrub species

SHRUBS (3MX3M)		SAMPLE SITE – III: Command/Ayacut Area In The Left-Hand Side Of The Alignment In NW Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Holarrhena pubescens*	2.00	0.8	40	9.45	8.70	7.14	25.29	0.008	0.09
2	*Pavonia zeylanica*	1.67	1	60	7.87	10.87	10.71	29.46	0.012	0.10
3	*Aristolochia indica*	1.00	0.6	60	4.72	6.52	10.71	21.96	0.004	0.08
4	*Cajanus scarabaeoides*	2.00	0.8	40	9.45	8.70	7.14	25.29	0.008	0.09
5	*Waltheria indica*	2.00	1.2	60	9.45	13.04	10.71	33.21	0.017	0.12
6	*Dodonaea viscosa*	2.00	0.8	40	9.45	8.70	7.14	25.29	0.008	0.09
7	*Lantana camara*	1.50	0.6	40	7.09	6.52	7.14	20.75	0.004	0.08
8	*Grewia hirsuta*	2.00	1.6	80	9.45	17.39	14.29	41.12	0.030	0.13
9	*Bridelia montana*	1.00	0.2	20	4.72	2.17	3.57	10.47	0.000	0.04
10	*Anisomeles indica*	1.00	0.4	40	4.72	4.35	7.14	16.21	0.002	0.06
11	*Carissa spinarum*	1.00	0.4	40	4.72	4.35	7.14	16.21	0.002	0.06
12	*Cayratia pedata*	2.00	0.4	20	9.45	4.35	3.57	17.37	0.002	0.06
13	*Clerodendrum phlomoides*	2.00	0.4	20	9.45	4.35	3.57	17.37	0.002	0.06
		21.17	**9.2**	**560**	**99.98**	**100**	**100**		**0.098**	**1.06**

Phyto-sociological features of herbs encountered in sample plots are given in Table 3.70. *Heteropogon contortus is* identified as the most dominant species with 36.38 Importance Value Index followed by *Cynodon dactylon* (31.37), *Allmania nodiflora* (27.97), *Cyanthillium cinereum* (25.41), *Byttneria herbacea & Rungia repens* (25.23) each species, etc. There are two important indices to

denote the diversity Simpson's Index values of 0.09 for herbs and the Shannon Wiener Index value of 1.09 for Herbs.

Table 3.70: Phytosociological attributes of Herbaceous species

HERBS (1MX1M)		SAMPLE SITE – III: Command/Ayacut Area In The Left Hand Side Of The Alignment In NW Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Tephrosia villosa*	1.00	0.2	20	3.16	1.52	3.33	8.01	0.00	0.03
2	*Sida cordifolia*	1.00	0.2	20	3.16	1.52	3.33	8.01	0.00	0.03
3	*Crotalaria ramosissima*	2.00	0.4	20	6.32	3.03	3.33	12.68	0.00	0.05
4	*Aristida adscensionis*	1.50	0.6	40	4.74	4.55	6.67	15.95	0.00	0.06
5	*Phyllanthus maderaspatensis*	2.00	0.8	40	6.32	6.06	6.67	19.04	0.00	0.07
6	*Alysicarpus monilifer*	2.00	0.8	40	6.32	6.06	6.67	19.04	0.00	0.07
7	*Leucas aspera*	1.67	1	60	5.26	7.58	10.00	22.84	0.01	0.08
8	*Andrographis paniculata*	1.67	1	60	5.26	7.58	10.00	22.84	0.01	0.08
9	*Byttneria herbacea*	3.00	1.2	40	9.47	9.09	6.67	25.23	0.01	0.09
10	*Rungia repens*	3.00	1.2	40	9.47	9.09	6.67	25.23	0.01	0.09
11	*Cyanthillium cinereum*	2.00	1.2	60	6.32	9.09	10.00	25.41	0.01	0.09
12	*Allmania nodiflora*	2.33	1.4	60	7.37	10.61	10.00	27.97	0.01	0.10
13	*Cynodon dactylon*	6.00	1.2	20	18.95	9.09	3.33	31.37	0.01	0.09
14	*Heteropogon contortus*	2.50	2	80	7.89	15.15	13.33	36.38	0.02	0.12
		31.67	**13**	**600**	**100**	**100**	**100**	**300**	**0.09**	**1.09**

SAMPLE SITE-4 (S-4)

Phyto-sociological features of trees encountered in sample plots are given in Table 3.71. *Grewia flavescens is* identified as the most dominant species with 37.91 Importance Value Index followed by *Chloroxylon swietenia* (35.60), *Diospyros chloroxylon* (27.45), *Morinda pubescens* (24.87), etc. There are two important indices to denote the diversity Simpson's Index values of 0.09 for trees and the Shannon Wiener Index value of 1.11 for trees.

Table 3.71: Phytosociological attributes of Tree species

TREES(10MX10M)		SAMPLE SITE – IV: Command/Ayacut Area In The Right Hand Side Of The Alignment In NE Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Ficus mollis*	1.00	0.2	20	3.27	1.49	3.13	7.89	0.000	0.03
2	*Azadirachta indica*	1.00	0.2	20	3.27	1.49	3.13	7.89	0.000	0.03
3	*Acacia nilotica*	1.00	0.2	20	3.27	1.49	3.13	7.89	0.000	0.03
4	*Miliusa*	2.00	0.4	20	6.54	2.99	3.13	12.65	0.001	0.05
5	*Terminalia bellirica*	2.00	0.4	20	6.54	2.99	3.13	12.65	0.001	0.05
6	*Premna mollissima*	2.00	0.4	20	6.54	2.99	3.13	12.65	0.001	0.05

TREES(10MX10M)		SAMPLE SITE – IV: Command/Ayacut Area In The Right Hand Side Of The Alignment In NE Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
7	*Butea monosperma*	2.00	0.8	40	6.54	5.97	6.25	18.76	0.004	0.07
8	*Dolichandrone atrovirens*	2.00	0.8	40	6.54	5.97	6.25	18.76	0.004	0.07
9	*Lagerstroemia parviflora*	2.00	0.8	40	6.54	5.97	6.25	18.76	0.004	0.07
10	*Wrightia tinctoria*	2.00	0.8	40	6.54	5.97	6.25	18.76	0.004	0.07
11	*Cleistanthus collinus*	2.00	0.8	40	6.54	5.97	6.25	18.76	0.004	0.07
12	*Ziziphus xylopyrus*	2.00	0.8	40	6.54	5.97	6.25	18.76	0.004	0.07
13	*Morinda pubescens*	2.00	1.2	60	6.54	8.96	9.38	24.87	0.008	0.09
14	*Diospyros chloroxylon*	2.33	1.4	60	7.63	10.45	9.38	27.45	0.011	0.10
15	*Chloroxylon swietenia*	2.50	2	80	8.18	14.93	12.50	35.60	0.022	0.12
16	*Grewia flavescens*	2.75	2.2	80	8.99	16.42	12.50	37.91	0.027	0.13
		30.58	**13**	**640**	**100**	**100**	**100**	**300**	**0.09**	**1.11**

Phyto-sociological features of shrubs encountered in sample plots are given in Table 3.72. *Hemidesmus indicus is* identified as the most dominant species with 49.06 Importance Value Index followed by *Waltheria indica* (40.67), *Carissa spinarum* (28.54), *Dichrostachys cinerea* (25.51), *Grewia hirsuta* (22.47), etc. There are two important indices to denote the diversity Simpson's Index values of 0.12 for shrubs and the Shannon Wiener Index value of 1.03 for shrubs.

Table 3.72: Phytosociological attributes of Shrub species

SHRUBS (3MX3M)		SAMPLE SITE – IV: Command/Ayacut Area In The Right Hand Side Of The Alignment In NE Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Dichrostachys cinerea*	1.67	1	60	6.39	8.77	10.34	25.51	0.01	0.09
2	*Breynia vitis-idaea*	2.00	0.4	20	7.67	3.51	3.45	14.63	0.00	0.05
3	*Grewia hirsuta*	1.33	0.8	60	5.11	7.02	10.34	22.47	0.00	0.08
4	*Carissa spinarum*	2.00	1.2	60	7.67	10.53	10.34	28.54	0.01	0.10
5	*Jatropha glandulifera*	2.00	0.4	20	7.67	3.51	3.45	14.63	0.00	0.05
6	*Hemidesmus indicus*	3.25	2.6	80	12.46	22.81	13.79	49.06	0.05	0.15
7	*Dodonaea viscosa*	2.00	0.8	40	7.67	7.02	6.90	21.58	0.00	0.08
8	*Waltheria indica*	3.33	2	60	12.78	17.54	10.34	40.67	0.03	0.13
9	*Canthium coromandelicum*	1.00	0.2	20	3.83	1.75	3.45	9.04	0.00	0.03
10	*Bridelia montana*	1.00	0.4	40	3.83	3.51	6.90	14.24	0.00	0.05
11	*Getonia floribunda*	1.00	0.2	20	3.83	1.75	3.45	9.04	0.00	0.03
12	*Rotheca serrata*	2.00	0.4	20	7.67	3.51	3.45	14.63	0.00	0.05
13	*Flueggea leucopyrus*	1.50	0.6	40	5.75	5.26	6.90	17.91	0.00	0.07
14	*Gymnema sylvestre*	1.00	0.2	20	3.83	1.75	3.45	9.04	0.00	0.03
15	*Erythroxylum monogynum*	1.00	0.2	20	3.83	1.75	3.45	9.04	0.00	0.03
		26.08	**11**	**580**	**100**	**100**	**100**	**300**	**0.12**	**1.03**

Phyto-sociological features of herbs encountered in sample plots are given in Table 3.73. *Eragrostiella bifaria is* identified as the most dominant species with 34.53 Importance Value

Index followed by *Hyptis suaveolens, Spermacoce pusilla & Kyllinga bulbosa* (24.41) each, *Glossocardia bosvallia* (23.72), *Orthosiphon rubicundus* (20.39), etc. There are two important indices to denote the diversity Simpson's Index values of 0.080 for herbs and the Shannon Wiener Index value of 1.16 for Herbs.

Table 3.73: Phytosociological attributes of Herbaceous species

Herbs (1mx1m)		SAMPLE SITE – IV: Command/Ayacut Area In The Right Hand Side Of The Alignment In NE Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Rhynchosia minima*	1.00	0.2	20	2.50	1.18	2.78	6.45	0.000	0.02
2	*Echinops echinatus*	2.00	0.4	20	5.00	2.35	2.78	10.13	0.001	0.04
3	*Sesamum indicum*	2.00	0.4	20	5.00	2.35	2.78	10.13	0.001	0.04
4	*Apluda mutica*	2.00	0.4	20	5.00	2.35	2.78	10.13	0.001	0.04
5	*Elytraria acaulis*	2.00	0.4	20	5.00	2.35	2.78	10.13	0.001	0.04
6	*Leucas aspera*	2.00	0.4	20	5.00	2.35	2.78	10.13	0.001	0.04
7	*Heteropogon contortus*	2.00	0.4	20	5.00	2.35	2.78	10.13	0.001	0.04
8	*Evolvulus alsinoides*	2.00	0.4	20	5.00	2.35	2.78	10.13	0.001	0.04
9	*Dinebra retroflexa*	2.00	0.8	40	5.00	4.71	5.56	15.26	0.002	0.06
10	*Byttneria herbacea*	2.00	0.8	40	5.00	4.71	5.56	15.26	0.002	0.06
11	*Gomphrena serrata*	3.00	1.2	40	7.50	7.06	5.56	20.11	0.005	0.08
12	*Justicia procumbens*	3.00	1.2	40	7.50	7.06	5.56	20.11	0.005	0.08
13	*Orthosiphon rubicundus*	2.00	1.2	60	5.00	7.06	8.33	20.39	0.005	0.08
14	*Glossocardia bosvallia*	1.75	1.4	80	4.38	8.24	11.11	23.72	0.007	0.09
15	*Hyptis suaveolens*	2.67	1.6	60	6.67	9.41	8.33	24.41	0.009	0.10
16	*Spermacoce pusilla*	2.67	1.6	60	6.67	9.41	8.33	24.41	0.009	0.10
17	*Kyllinga bulbosa*	2.67	1.6	60	6.67	9.41	8.33	24.41	0.009	0.10
18	*Eragrostiella bifaria*	3.25	2.6	80	8.13	15.29	11.11	34.53	0.023	0.12
		40.00	**17**	**720**	**100**	**100**	**100**	**300**	**0.080**	**1.16**

3.9.11.1.6 Phyto-Sociological Assessment during Pre-Monsson Season (February-March, 2020)

SAMPLING SITE (S-1)

Phyto-sociological features of trees recorded in Sampling Site-1 (S-1) are shown in **Table 3.74.** *Hardwickia binata* is identified as the most dominant species with 36.57 Importance Value Index followed by *Terminalia tomentosa* (35.07), *Albizia amara* (35.06), *Tectona grandis* (28.70), *Bombax ceiba* (26.50), *Boswellia serrata* (24.59) and *Aegle marmelos* (23.11) respectively. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and species dominance i.e. Simpson's Index (λ). For trees, Simpson's Index value is 0.0864 and the Shannon Wiener Index value is 1.03.

Table 3.74: Phytosociological attributes of Tree species

TREES (10MX10M)		Sample Site – I: Land Area In The Environs Of Venkatadri And Kurumurthyraya And Along The Alignment In The Reservoirs								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Boswellia serrata*	2.48	1.2	40	7.49	8.77	8.33	24.59	0.008	0.09
2	*Bombax ceiba*	1.61	1	50	5.23	8.77	12.5	26.50	0.007	0.09
3	*Tectona grandis*	2.95	1.32	40	9.84	10.53	8.33	28.70	0.012	0.1

4	*Hardwickia binate*	3.86	1.52	40	14.2	14.04	8.33	36.57	0.02	0.12
5	*Albizia amara*	2.59	1.48	80	8.52	14.04	12.5	35.06	0.02	0.12
6	*Terminalia tomentosa*	1.69	1.39	60	6.12	12.28	16.67	35.07	0.0014	0.11
7	*Anogeissus latifolia*	2.1	0.33	20	5.89	3.51	4.17	13.57	0.001	0.05
8	*Soymida febrifuga*	2.01	0.52	20	7.55	3.5	4.17	15.22	0.001	0.05
9	*Lagerstroemia parviflora*	3.22	0.54	40	10.14	5.26	4.17	19.57	0.003	0.07
10	*Bridelia retusa*	3.05	0.49	20	10.14	5.26	4.17	19.57	0.003	0.07
11	*Bombax ceiba*	1.92	0.89	40	7.12	7.02	8.33	22.47	0.005	0.08
12	*Aegle marmelos*	1.89	0.75	40	7.76	7.02	8.33	23.11	0.005	0.08
		29.37	**11.43**	**490**	**100**	**100**	**100**	**300**	**0.0864**	**1.03**

Phyto-sociological features of shrubs recorded in Sampling Site-1 (S-1) are shown in **Table 3.75.** *Grewia hirsute* is identified as the most dominant species with 61.54 Importance Value Index followed by *Helicteres isora* (48.08), *Calotropis gigantea* (39.10), *Jatropha curcas* (32.92) & *Tarenna asiatica* (32.90) etc. respectively. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For shrubs, Simpson's Index value is 0.15 and the Shannon Wiener Index value is 0.86.

Table 3.75: Phytosociological attributes of Shrub species

SHRUBS (3MX3M)		SAMPLE SITE – I: Land Area In The Environs Of Venkatadri And Kurumurthyraya And Along The Alignment In The Reservoirs								
S. No.	**Name of the species**	**A**	**D**	**F**	**RA**	**RD**	**RF**	**IVI**	**Simpson's Dominance index**	**Shannon-Wiener Diversity Index**
1	*Adhatoda zeylanica*	1.50	0.6	40	8.66	7.69	11.11	27.46	0.01	0.09
2	*Vitex negundo*	1.50	0.6	40	8.66	7.69	11.11	27.46	0.01	0.09
3	*Annona squamosa*	3.00	0.6	20	17.31	7.69	5.56	30.56	0.01	0.09
4	*Tarenna asiatica*	2.00	0.8	40	11.54	10.26	11.10	32.90	0.01	0.10
5	*Jatropha curcas*	2.00	0.8	40	11.54	10.26	11.13	32.92	0.01	0.10
6	*Calotropis gigantea*	1.67	1	60	9.62	12.82	16.67	39.10	0.02	0.11
7	*Helicteres isora*	2.33	1.4	60	13.46	17.95	16.67	48.08	0.03	0.13
8	*Grewia hirsuta*	3.33	2	60	19.23	25.64	16.67	61.54	0.07	0.15
		17.33	**7.8**	**360**	**100**	**100**	**100**	**300**	**0.15**	**0.86**

Phyto-sociological features of shrubs recorded in Sampling Site-1 (S-1) are shown in **Table 3.76**. *Phyllanthus amarus* is identified as the most dominant species with 52.80 Importance Value Index followed by *Cynodon dactylon* (44.13), *Rivea hypocrateriformis* (34.91), *Heteropogon contortus* (31.79), *Aristolochia bracteolata* (30.68) species etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For herbs, Simpson's Index value is 0.13 and the Shannon Wiener Index value is 0.93.

Table 3.76: Phytosociological attributes of Herbaceous species

HERBS (1MX1M)		Sample Site – I: Land Area In The Environs Of Venkatadri And Kurumurthyraya And Along The Alignment In The Reservoirs								
S. No.	**Name of the species**	**A**	**D**	**F**	**RA**	**RD**	**RF**	**IVI**	**Simpson's Dominance index**	**Shannon-Wiener Diversity Index**
1	*Abrus precatorius*	1.00	0.2	20	4.38	2.04	4.76	11.18	0.000	0.03
2	*Tribulus terrestris*	2.00	0.4	20	8.76	4.08	4.76	17.60	0.002	0.06

3	*Ampelocissus tomentosa*	3.00	0.6	20	13.14	6.12	4.76	24.02	0.004	0.07
4	*Gloriosa superba*	2.00	0.8	40	8.76	8.16	9.52	26.45	0.007	0.09
5	*Mucuna pruriens*	2.00	0.8	40	8.76	8.16	9.52	26.45	0.007	0.09
6	*Aristolochia bracteolata*	2.50	1	40	10.95	10.20	9.52	30.68	0.010	0.10
7	*Heteropogon contortus*	1.67	1	60	7.30	10.20	14.29	31.79	0.010	0.10
8	*Rivea hypocrateriformis*	3.00	1.2	40	13.14	12.24	9.52	34.91	0.015	0.11
9	*Cynodon dactylon*	2.00	1.6	80	8.76	16.33	19.05	44.13	0.027	0.13
10	*Phyllanthus amarus*	3.67	2.2	60	16.06	22.45	14.29	52.80	0.050	0.15
		22.83	**9.8**	**420**	**100.00**	**100.00**	**100.00**	**300**	**0.132**	**0.93**

SAMPLING SITE (S-2)

Phyto-sociological features of trees encountered in sample plots are shown in **Table 3.77.** *Tectona grandis is* identified as the most dominant species with 35.61 Importance Value Index followed by *Acacia leucophloea* (32.66), *Albizia amara* & *Acacia ferruginea* (26.75) each, *Lannea coromandelica* & *Wrightia tinctoria* (24.60) species, etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For trees, Simpson's Index value is 0.09 and the Shannon Wiener Index value is 1.08.

Table 3.77: Phytosociological attributes of Tree species

TREES (10MX10M)		SAMPLE SITE – II: Land Area In The Environs Of Udandpur & K.P. Laksmidevipalle Reservoirs And Land Area Along The Alignment In The Reservoirs								
S. No.	**Name of the species**	**A**	**D**	**F**	**RA**	**RD**	**RF**	**IVI**	**Simpson's Dominance index**	**Shannon-Wiener Diversity Index**
1	*Chloroxylon swietenia*	2.00	0.4	20	6.59	3.70	4.00	14.30	0.00	0.05
2	*Gmelina arborea*	1.50	0.6	40	4.95	5.56	8.00	18.50	0.00	0.07
3	*Terminalia alata*	2.00	0.8	40	6.59	7.41	8.00	22.00	0.01	0.08
4	*Lannea coromandelica*	4.00	0.8	20	13.19	7.41	4.00	24.60	0.01	0.08
5	*Albizia amara*	1.67	1	60	5.50	9.26	12.00	26.75	0.01	0.10
6	*Acacia ferruginea*	1.67	1	60	5.50	9.26	12.00	26.75	0.01	0.10
7	*Acacia leucophloea*	2.33	1.4	60	7.69	12.96	12.00	32.66	0.02	0.12
8	*Tectona grandis*	2.67	1.6	60	8.79	14.81	12.00	35.61	0.02	0.12
		18.17	**8.4**	**360**	**99.98**	**100.00**	**100.00**		**0.15**	**0.86**

Phyto-sociological features of shrubs encountered in sample plots are shown in Table 3.78. *Waltheria indica* is identified as the most dominant species with 58.82 Importance Value Index followed by *Hemidesmus indicus* (46.18), *Anisomeles indica* (41.96), *Phoenix loureiroi* (41.91), *Cocculus hirsutus & Helicteres isora* (31.64) each species, etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For shrubs, Simpson's Index value is 0.15 and the Shannon Wiener Index value is 0.86.

Table 3.78: Phytosociological attributes of Shrub species

SHRUBS (3MX3M)	SAMPLE SITE – II: Land Area In The Environs Of Udandpur & K.P. Laksmidevipalle Reservoirs And Land Area Along The Alignment In The Reservoirs

S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Anisomeles indica*	2.00	1.2	60	11.01	14.29	16.67	41.96	0.02	0.12
2	*Hemidesmus indicus*	2.33	1.4	60	12.84	16.67	16.67	46.18	0.03	0.13
3	*Cocculus hirsutus*	2.00	0.8	40	11.01	9.52	11.11	31.64	0.01	0.10
4	*Phoenix loureiroi*	3.00	1.2	40	16.51	14.29	11.11	41.91	0.02	0.12
5	*Dioscorea oppositifolia*	1.50	0.6	40	8.26	7.14	11.11	26.51	0.01	0.08
6	*Waltheria indica*	3.33	2	60	18.35	23.81	16.67	58.82	0.06	0.15
7	*Helicteres isora*	2.00	0.8	40	11.01	9.52	11.11	31.64	0.01	0.10
8	*Cissampelos pareira*	2.00	0.4	20	11.01	4.76	5.56	21.32	0.00	0.06
		18.17	**8.4**	**360**	**99.98**	**100.00**	**100.00**	**300**	**0.15**	**0.86**

Phyto-sociological features of herbs encountered in sample plots are shown in Table 3.79. *Byttneria herbacea is* identified as the most dominant species with 45.21 Importance Value Index followed by *Tephrosia villosa* & *Knoxia sumatrensis* (35.14) species, etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For herbs, Simpson's Index value is 0.12 and the Shannon Wiener Index value is 0.97.

Table 3.79: Phytosociological attributes of Herbaceous species

HERBS (1MX1M)		SAMPLE SITE – II: Land Area In The Environs Of Udandpur & K.P. Laksmidevipalle Reservoirs And Land Area Along The Alignment In The Reservoirs								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Rhynchosia minima*	2.00	0.4	20	7.64	4.17	5.00	16.81	0.00	0.06
2	*Pulicaria wightiana*	1.50	0.6	40	5.73	6.25	10.00	21.98	0.00	0.08
3	*Orthosiphon rubicundus*	3.00	0.6	20	11.46	6.25	5.00	22.71	0.00	0.08
4	*Dicoma tomentosa*	4.00	0.8	20	15.28	8.33	5.00	28.62	0.01	0.09
5	*Iphigenia mysorensis*	4.00	0.8	20	15.28	8.33	5.00	28.62	0.01	0.09
6	*Hyptis suaveolens*	1.67	1	60	6.37	10.42	15.00	31.79	0.01	0.10
7	*Fimbristylis cymosa*	3.00	1.2	40	11.46	12.50	10.00	33.96	0.02	0.11
8	*Tephrosia villosa*	2.00	1.2	60	7.64	12.50	15.00	35.14	0.02	0.11
9	*Knoxia sumatrensis*	2.00	1.2	60	7.64	12.50	15.00	35.14	0.02	0.11
10	*Byttneria herbacea*	3.00	1.8	60	11.46	18.75	15.00	45.21	0.04	0.14
		26.17	**9.6**	**400**	**99.99**	**100**	**100**		**0.12**	**0.97**

SAMPLING SITE (S-3)

Phyto-sociological features of trees encountered in sample plots are shown in Table 3.80. *Annona squamosa is* identified as the most dominant species with 41.92 Importance Value Index followed by *Morinda pubescens* & *Alangium salviifolium* (34.57) each, *Wrightia tinctoria* & *Buchanania cochinchinensis* (30.89), *Grewia flavescens* & *Aegle marmelos* (26.15) each species, etc.

There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For trees, Simpson's Index value is 0.11 and the Shannon Wiener Index value is 1.00.

Table 3.80: Phytosociological attributes of Tree species

TREES (10MX10M)		Sample Site – III: Command/Ayacut Area In The Left Hand Side Of The Alignment In Nw Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Balanites aegyptiaca*	2.00	0.4	20	9.30	4.26	4.17	17.72	0.00	0.06
2	*Diospyros chloroxylon*	2.00	0.4	20	9.30	4.26	4.17	17.72	0.00	0.06
3	*Dolichandrone atrovirens*	2.00	0.4	20	9.30	4.26	4.17	17.72	0.00	0.06
4	*Acacia chundra*	1.50	0.6	40	6.98	6.38	8.33	21.69	0.00	0.08
5	*Grewia flavescens*	2.00	0.8	40	9.30	8.51	8.33	26.15	0.01	0.09
6	*Aegle marmelos*	2.00	0.8	40	9.30	8.51	8.33	26.15	0.01	0.09
7	*Wrightia tinctoria*	1.67	1	60	7.75	10.64	12.50	30.89	0.01	0.10
8	*Buchanania cochinchinensis*	1.67	1	60	7.75	10.64	12.50	30.89	0.01	0.10
9	*Morinda pubescens*	2.00	1.2	60	9.30	12.77	12.50	34.57	0.02	0.11
10	*Alangium salviifolium*	2.00	1.2	60	9.30	12.77	12.50	34.57	0.02	0.11
11	*Annona squamosa*	2.67	1.6	60	12.40	17.02	12.50	41.92	0.03	0.13
		21.50	**9.4**	**480**	**100**	**100**	**100**	**300**	**0.11**	**1.00**

Phyto-sociological features of shrubs encountered in sample plots are given in Table 3.81. *Aristolochia indica* is identified as the most dominant species with 54.19 Importance Value Index followed by *Waltheria indica* (43.27), *Grewia hirsute* & *Euphorbia caducifolia* (38.92), etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For shrubs, Simpson's Index value is 0.14 and the Shannon Wiener Index value is 0.88.

Table 3.81: Phytosociological attributes of Shrub species

SHRUBS (3MX3M)		SAMPLE SITE – III: Command/Ayacut Area In The Left Hand Side Of The Alignment In NW Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Flacourtia indica*	2.00	0.4	20	10.91	5.26	5.56	21.73	0.00	0.07
2	*Flueggea leucopyrus*	2.00	0.8	40	10.91	10.53	11.11	32.55	0.01	0.10
3	*Lantana camara*	2.00	0.8	40	10.91	10.53	11.11	32.55	0.01	0.10
4	*Hemidesmus indicus*	4.00	0.8	20	21.82	10.53	5.56	37.90	0.01	0.10
5	*Grewia hirsuta*	1.67	1	60	9.09	13.16	16.67	38.92	0.02	0.12
6	*Euphorbia caducifolia*	1.67	1	60	9.09	13.16	16.67	38.92	0.02	0.12
7	*Waltheria indica*	3.00	1.2	40	16.37	15.79	11.11	43.27	0.02	0.13
8	*Aristolochia indica*	2.00	1.6	80	10.91	21.05	22.22	54.19	0.04	0.14
		18.33	**7.6**	**360**	**100.02**	**100.00**	**100.00**	**300**	**0.14**	**0.88**

Phyto-sociological features of herbs encountered in sample plots are given in Table 3.82. *Dicoma tomentosa is* identified as the most dominant species with 54.15 Importance Value Index followed by *Byttneria herbacea* (44.50), *Rungia repens, Phyllanthus virgatus & Alysicarpus monilifer* (33.59), *Pupalia lappacea* (28.13) species, etc. There are two important indices to denote the diversity i.e.,

Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For herbs, Simpson's Index value is 0.13 and the Shannon Wiener Index value is 0.91.

Table 3.82: Phytosociological attributes of Herbaceous species

HERBS (1MX1M)		SAMPLE SITE – III: Command/Ayacut Area In The Left Hand Side Of The Alignment In NW Direction								
S.No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Cymbopogon citratus*	2.00	0.4	20	10.71	5.56	5.88	22.15	0.00	0.07
2	*Trichuriella monsoniae*	2.00	0.4	20	10.71	5.56	5.88	22.15	0.00	0.07
3	*Orthosiphon rubicundus*	1.50	0.6	40	8.03	8.33	11.76	28.13	0.01	0.09
4	*Pupalia lappacea*	1.50	0.6	40	8.03	8.33	11.76	28.13	0.01	0.09
5	*Rungia repens*	2.00	0.8	40	10.71	11.11	11.76	33.59	0.01	0.11
6	*Phyllanthus virgatus*	2.00	0.8	40	10.71	11.11	11.76	33.59	0.01	0.11
7	*Alysicarpus monilifer*	2.00	0.8	40	10.71	11.11	11.76	33.59	0.01	0.11
8	*Byttneria herbacea*	3.00	1.2	40	16.07	16.67	11.76	44.50	0.03	0.13
9	*Dicoma tomentosa*	2.67	1.6	60	14.28	22.22	17.65	54.15	0.05	0.15
		18.67	**7.2**	**340**	**99.98**	**100.00**	**100.00**	**300**	**0.13**	**0.91**

SAMPLING SITE (S-4)

Phyto-sociological features of trees encountered in sample plots are given in Table 3.83. *Grewia flavescens is* identified as the most dominant species with 52.44 Importance Value Index followed by *Acacia farnesiana* (49.41), *Butea monosperma* & *Ziziphus xylopyrus* (34.19), *Dolichandrone atrovirens, Wrightia tinctoria* & *Morinda pubescens* (25.97), species, etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For trees, Simpson's Index value is 0.14 and the Shannon Wiener Index value is 0.93.

Table 3.83: Phytosociological attributes of Tree species

TREES(10MX10M)		SAMPLE SITE – IV: Command/Ayacut Area In The Right Hand Side Of The Alignment In NE Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominance index	Shannon-Wiener Diversity Index
1	*Balanites aegyptiaca*	2.00	0.4	20	8.60	3.92	4.76	17.29	0.00	0.06
2	*Dalbergia sissoo*	2.00	0.4	20	8.60	3.92	4.76	17.29	0.00	0.06
3	*Holoptelea integrifolia*	2.00	0.4	20	8.60	3.92	4.76	17.29	0.00	0.06
4	*Dolichandrone atrovirens*	2.00	0.8	40	8.60	7.84	9.52	25.97	0.01	0.09
5	*Wrightia tinctoria*	2.00	0.8	40	8.60	7.84	9.52	25.97	0.01	0.09
6	*Morinda pubescens*	2.00	0.8	40	8.60	7.84	9.52	25.97	0.01	0.09
7	*Butea monosperma*	3.00	1.2	40	12.90	11.76	9.52	34.19	0.01	0.11
8	*Ziziphus xylopyrus*	3.00	1.2	40	12.90	11.76	9.52	34.19	0.01	0.11
9	*Acacia farnesiana*	2.50	2	80	10.75	19.61	19.05	49.41	0.04	0.14
10	*Grewia flavescens*	2.75	2.2	80	11.83	21.57	19.05	52.44	0.05	0.14
		23.25	**10.2**	**420**	**100.00**	**100.00**	**100.00**	**300**	**0.14**	**0.93**

Phyto-sociological features of shrubs encountered in sample plots are given in Table 3.84. *Waltheria indica is* identified as the most dominant species with 50.41 Importance Value Index followed by *Hemidesmus indicus* (45.02), *Erythroxylum monogynum*, *Canthium coromandelicum* & *Grewia hirsuta*

(40.97), *Breynia vitis-idaea* & *Dodonaea viscosa* (30.76), etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For shrubs, Simpson's Index value is 0.14 and the Shannon Wiener Index value is 0.88.

Table 3.84: Phytosociological attributes of Shrub species

SHRUBS (3MX3M)		SAMPLE SITE – IV: Command/Ayacut Area In The Right Hand Side Of The Alignment In NE Direction								
S. No.	Name of the species	A	D	F	RA	RD	RF	IVI	Simpson's Dominane index	Shannon-Wiener Diversity Index
1	*Erythroxylum monogynum*	2.00	1.2	60	10.35	13.95	16.67	40.97	0.02	0.12
2	*Breynia vitis-idaea*	2.00	0.8	40	10.35	9.30	11.11	30.76	0.01	0.10
3	*Canthium coromandelium*	3.00	1.2	40	15.52	13.95	11.11	40.58	0.02	0.12
4	*Grewia hirsuta*	2.00	1.2	60	10.35	13.95	16.67	40.97	0.02	0.12
5	*Hemidesmus indicus*	2.33	1.4	60	12.07	16.28	16.67	45.02	0.03	0.13
6	*Dodonaea viscose*	2.00	0.8	40	10.35	9.30	11.11	30.76	0.01	0.10
7	*Waltheria indica*	4.00	1.6	40	20.69	18.60	11.11	50.41	0.03	0.14
8	*Derris scandens*	2.00	0.4	20	10.35	4.65	5.56	20.55	0.00	0.06
		19.33	**8.6**	**360**	**100**	**100**	**100**	**300**	**0.14**	**0.88**

Phyto-sociological features of herbs encountered in sample plots are given in Table 3.85 *Apluda mutica is identified* as the most dominant species with 60.21 Importance Value Index followed by *Tephrosia purpurea* (38.67), *Pupalia lappacea* (32.41), *Hyptis suaveolens* (31.80), *Pulicaria wightiana, Cyanthillium cinereum* & *Crotalaria medicaginea* (24.23), each species, etc. There are two important indices to denote the diversity i.e., Shannon Wiener Index (H') and dominance i.e. Simpson's Index (λ). For herbs, Simpson's Index value is 0.14 and the Shannon Wiener Index value is 0.94.

Table 3.85: Phytosociological attributes of Herbaceous species

HERBS (1MX1M)		SAMPLE SITE – IV: Command/Ayacut Area In The Right Hand Side Of The Alignment In NE Direction								
S. No.	**Name of the species**	**A**	**D**	**F**	**RA**	**RD**	**RF**	**IVI**	**Simpson's Dominance index**	**Shannon - Wiener Diversity Index**
1	*Orthosiphon rubicundus*	2.00	0.4	20	7.87	3.64	4.55	16.05	0.00	0.05
2	*Byttneria herbacea*	2.00	0.4	20	7.87	3.64	4.55	16.05	0.00	0.05
3	*Hibiscus micranthus*	2.00	0.4	20	7.87	3.64	4.55	16.05	0.00	0.05
4	*Corchorus aestuans*	2.00	0.4	20	7.87	3.64	4.55	16.05	0.00	0.05
5	*Pulicaria wightiana*	2.00	0.8	40	7.87	7.27	9.09	24.23	0.01	0.08
6	*Cyanthillium cinereum*	2.00	0.8	40	7.87	7.27	9.09	24.23	0.01	0.08
7	*Crotalaria medicaginea*	2.00	0.8	40	7.87	7.27	9.09	24.23	0.01	0.08
8	*Hyptis suaveolens*	3.00	1.2	40	11.80	10.91	9.09	31.80	0.01	0.10
9	*Pupalia lappacea*	2.00	1.2	60	7.87	10.91	13.64	32.41	0.01	0.10
10	*Tephrosia purpurea*	2.67	1.6	60	10.49	14.55	13.64	38.67	0.02	0.12
11	*Apluda mutica*	3.75	3	80	14.75	27.27	18.18	60.21	0.07	0.15
		25.42	**11**	**440**	**100**	**100**	**100**	**300**	**0.14**	**0.94**

3.9.11.1.7 Rare Threatened and Endangered Plant Species

As per IUCN Redlist, *Chloroxylon swietenia, Cleistanthus collinus, Dalbergia latifolia, Pterocarpus marsupium, Cayratia pedata, Curcuma pseudomontana* are vulnerable species encountered during the present study in the study area.

3.9.12 Terrestrial Fauna

The list of faunal species found in the study area has been compiled with the help of secondary sources like Forest Working Plans and was supplemented with information provided by local people during field surveys in the study area.

3.9.12.1 Mammals

To study the probable occurrence of mammals in the area, 2-3 km long transects and trails were walked at each sampling site for any sighting and also by collecting indirect evidence gathered by talking to locals during interaction. For compilation of list aid from Forest Working Plans was taken.

A list of 19 species of mammals reportedly found in the study area was compiled from secondary sources as well-found during survey and the same is given in **Table 3.86**.

Table 3.86: List of mammals reported from the study area with their conservation status

S. N.	Species	Common name	IUCN Red List Category	WPA, 1972 Schedule
1.	**Antilope cervicapra**	**Blackbuck**	**LC**	**Sch I (Part I)**
2.	*Axis Synod*	Chital	LC	Sch III
3.	*Boselaphus tragocamelus*	Nilgai	LC	Sch III
4.	***Canip lupus***	**Wolf**	**-**	**Sch I (Part I)**
5.	*Canis aureus*	Golden Jackal	LC	Sch II (Part I)
6.	*Cervus unicolour*	Sambhar	-	Sch III
7.	*Cuon alpinus*	Wild dog	-	Sch II (Part I)
8.	*Felus chaus*	Jungle Cat	LC	Sch II (Part I)
9.	*Hyaena Felis*	Striped Hyaena	**NT**	Sch III
10.	*Lepus ruficandatus*	Indian Hare	LC	Sch IV
11.	***Lutrogale perspicillata***	**Smooth coated otter**	**VU**	**Sch I (Part II)**
12.	*Macaca mulatta*	Rhesus macaque	LC	Sch II (Part I)
13.	*Mus booduga*	Little Indian Field Mouse	LC	Sch IV
14.	***Panthera pardus***	**Leopard**	**VU**	**Sch I (Part I)**
15.	***Panthera tigris***	**Tiger**	**EN**	**Sch I (Part I)**
16.	*Rattus Rattus*	House Rat	LC	Sch V
17.	*Semnopithecus entellus*	Monkey	**NT**	Sch II (Part I)
18.	*Sus scrofa*	Wild Boar	**NT**	Sch III
19.	*Vulpes bengalensis*	Bengal Fox	LC	Sch II (Part I)

**Source: field survey VSPL and Secondary data from Forest Working Plan*

IUCN- International Union for Conservation of Nature; WPA – Wildlife (Protection) Act, 1972

VU – Vulnerable; NT- Near Threatened; LC - Least Concern

3.9.12.2 *Avifauna*

The avifaunal study was carried out in the study area during the Monsoon (August, 2019) & Winter (November, 2019), when birds from the central Asian countries visit different part of India and use it as a wintering ground followed by study in breeding & cropping season).

The techniques provided in Alfred and Ramakrishna (2004), Ghosh *et.al*. (1990) and Narawade *et al.* (2013) for general Faunistic survey were considered for the present investigation. Identification of avifauna species in the field was carried out with the help of the following field guides:

- Birds of the Indian Subcontinent by R. Grimmett, C. Inskipp & T. Inskipp (SecondEdittion,2014);
- Salim Ali's Book of Indian Birds Indian Bird by Salim Ali (Thirteenth Revised Edition, 2002);
- Bats of the Indian Subcontinent by Bates and Harrison (1997);
- A Field Guide to Indian Mammals by Vivek Menon (2014);
- Scientific publications of Zoological Survey of India (Subsidiary Govt. organization under the control of Ministry of Environment and Climate Change (MoEF&CC), Govt. of India, New Delhi);
- Scientific publications of Bombay Natural History Society (BNHS) and;
- Scientific publications of Wildlife Institute of India (WII).

Comet 10x50 DPSI power (Night vision) standard binocular was used to scan the area to spot bird-species and Cannon EOS 700D, 18-megapixel DSLR (Digital Single-Lens Reflex) Camera was used for taking pictures during the survey.

The avifaunal profile of the study area gives details of resident and migratory bird species having recorded ranges that include the study area.

Resident Avifauna

Resident bird species identified through primary survey with conservation status of the species are provided below in **Table 3.87.** The species sighted during the primary survey and that of conservation status as per the criteria mentioned above are also listed in separate column of the table and are typed in **Bold Font.**

Table 3.87: Resident Avifauna Recorded in Study Area During the Study Period

S.No.	Zoological Name	Common name	Order	IUCN Red List Category*	WPA Schedule	CITES Status	CMS Appendix	Observation during Site Survey in Monsoon Season (August, 2019)	Observation during Site Survey in Winter Season (Feb-March-2020)
1.	*Acridotheres tristis*	Common Myna	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
2.	*Aegithina tiphia*	Common Iora	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
3.	*Ammomanes phoenicura*	Rufous-tailed Lark	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
4.	*Anthus rufulus*	Paddyfield Pipit	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
5.	*Ardeola grayii*	Indian Pond-heron	Pelecaniformes	LC	IV	--	--	--	**Recorded**
6.	*Argya malcolmi*	Large Grey Babbler	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
7.	*Athene brama*	Spotted Owlet	Strigiformes	LC	IV	**II**	--	--	**Recorded**
8.	*Bubulcus ibis*	Cattle Egret	Pelecaniformes	LC	IV	--	--	**Recorded**	**Recorded**
9.	*Centropus sinensis*	Greater Coucal	Cuculiformes	LC	--	--	--	**Recorded**	**Recorded**
10.	*Charadrius dubius*	Little Ringed Plover	Charadriiformes	LC	IV	--	**II**	**Recorded**	--
11.	*Cinnyris asiaticus*	Purple Sunbird	Passeriformes	LC	IV	--	--	**Recorded**	--
12.	*Cisticola juncidis*	Zitting Cisticola	Passeriformes	LC	--	--	--	**Recorded**	--
13.	*Columba livia*	Rock Dove	Columbiformes	LC	IV	--	--	**Recorded**	**Recorded**
14.	*Copsychus saularis*	Oriental Magpie-robin	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
15.	*Coracias benghalensis*	Indian Roller	Coraciiformes	LC	IV	--	--	**Recorded**	**Recorded**
16.	*Corvus splendens*	House Crow	Passeriformes	LC	V	--	--	--	**Recorded**
17.	*Dicaeum erythrorhynchos*	Pale-billed Flowerpecker	Passeriformes	LC	IV	--	--	**Recorded**	--
18.	*Dicrurus caerulescens*	White-bellied Drongo	Passeriformes	LC	IV	--	--	**Recorded**	--
19.	*Dicrurus macrocercus*	Black Drongo	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
20.	*Dumetia hyperythra*	Tawny-bellied Babbler	Passeriformes	LC	IV	--	--	**Recorded**	--
21.	*Egretta garzetta*	Little Egret	Pelecaniformes	LC	IV	--	--	**Recorded**	--
22.	*Elanus caeruleus*	Black-winged Kite	Accipitriformes	LC	IV	**II**	--	**Recorded**	**Recorded**
23.	*Eremopterix griseus*	Ashy-crowned Sparrow-lark	Passeriformes	LC	IV	--	--	**Recorded**	--

S.No.	Zoological Name	Common name	Order	IUCN Red List Category*	WPA Schedule	CITES Status	CMS Appendix	Observation during Site Survey in Monsoon Season (August, 2019)	Observation during Site Survey in Winter Season (Feb-March-2020)
24.	*Eudynamys scolopaceus*	Western Koel	Cuculiformes	LC	IV	--	--	**Recorded**	--
25.	*Francolinus pictus*	Painted Francolin	Galliformes	LC	IV	--	--	**Recorded**	--
26.	*Fulica atra*	Common Coot	Gruiformes	LC	IV	--	**II**	**Recorded**	**Recorded**
27.	*Geokichla citrina*	Orange-headed Thrush	Passeriformes	LC	--	--	--	**Recorded**	**Recorded**
28.	***Gyps indicus***	**Long Billed Vulture/Indian Vulture**		**CE**	**I**	**--**	**--**	**--**	**--**
29.	*Hierococcyx varius*	Common Hawk-cuckoo	Cuculiformes	LC	IV	--	--	**Recorded**	**Recorded**
30.	*Lanius vittatus*	Bay-backed Shrike	Passeriformes	LC	--	--	--	**Recorded**	--
31.	*Leptocoma zeylonica*	Purple-rumped Sunbird	Passeriformes	LC	IV	--	--	**Recorded**	--
32.	*Lonchura (Malacca) atricapilla*	Chestnut Munia	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
33.	*Merops philippinus*	Blue-tailed Bee-eater	Coraciiformes	LC	--	--	--	**Recorded**	**Recorded**
34.	*Microcarbo niger*	Little Cormorant	Suliformes	LC	IV	--	--	**Recorded**	**Recorded**
35.	*Motacilla maderaspatensis*	White-browed Wagtail	Passeriformes	LC	IV	--	--	--	**Recorded**
36.	*Passer domesticus*	House Sparrow	Passeriformes	LC	--	--	--	**Recorded**	**Recorded**
37.	***Pavo cristatus***	**Indian Peafowl**	**Galliformes**	**LC**	**I**	**--**	**--**	**Recorded**	**Recorded**
38.	*Perdicula asiatica*	Jungle Bush-quail	Galliformes	LC	IV	--	--	**Recorded**	--
39.	*Pericrocotus cinnamomeus*	Small Minivet	Passeriformes	LC	--	--	--	**Recorded**	**Recorded**
40.	*Ploceus philippinus*	Baya Weaver	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
41.	*Porphyrio porphyria*	Purple Swamphen	Gruiformes	LC	IV	--	--	**Recorded**	**Recorded**
42.	*Psittacula eupatria*	Alexandrine Parakeet	Psittaciformes	**NT**	IV	**II**	--	**Recorded**	--
43.	*Psittacula krameri*	Rose-ringed Parakeet	Psittaciformes	LC	IV	--	--	**Recorded**	**Recorded**
44.	*Pycnonotus cafer*	Red-vented Bulbul	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
45.	*Rhipidura aureola*	White-browed Fantail	Passeriformes	LC	--	--	--	**--**	**Recorded**
46.	*Saxicola caprata*	Pied Bushchat	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**

S.No.	Zoological Name	Common name	Order	IUCN Red List Category*	WPA Schedule	CITES Status	CMS Appendix	Observation during Site Survey in Monsoon Season (August, 2019)	Observation during Site Survey in Winter Season (Feb-March-2020)
47.	*Saxicoloides fulicatus*	Indian Robin	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
48.	*Spilopelia senegalensis*	Laughing Dove	Columbiformes	LC	IV	--	--	**Recorded**	**Recorded**
49.	*Streptopelia decaocto*	Eurasian Collared-dove	Columbiformes	LC	IV	--	--	**Recorded**	--
50.	*Upupa epops*	Common Hoopoe	Bucerotiformes	LC	--	--	--	**--**	**Recorded**
51.	*Vanellus indicus*	Red-wattled Lapwing	Charadriiformes	LC	IV	--	--	**--**	**Recorded**

** Status assigned by the International Union for Conservation of Nature and Natural Resources, where - C – Least Concern; NT – Near Threatened; CE=Critically Endangered*

**Sources: R. Grimmett, C. Inskipp & T. Inskipp, Birds of the Indian Subcontinent; Salim Ali, Book of Indian Birds; IUCN Red Data List, https://www.cites.org/, www.cms.int/en/species*

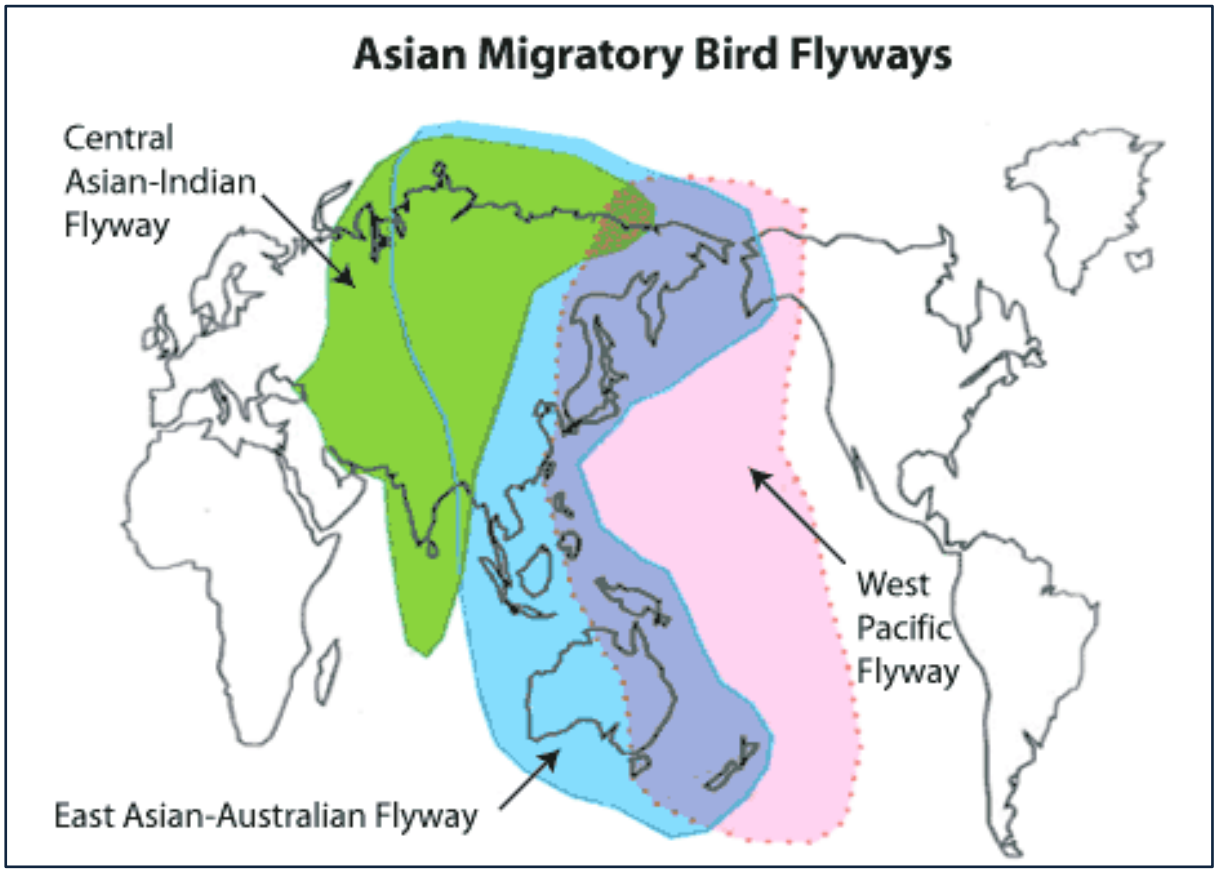
Forest Working Plan Rangareddy, Nalgonda & and Mahbubnagar districts, 2003-2004.

Migratory Bird Species

The migratory birds start visiting the wintering grounds in India from the month of September and stay till the month of March. The migration of the birds happens along nine certain migratory flyways globally. Three flyways overlap the Indian mainland and support high concentrations of migratory birds including several threatened species. Two of these flyways viz. Central Asian Flyway and West Asian-East African Flyway overlap each other in Kutch region of Gujarat state.

Central Asian Flyway

The Central Asian Flyway (CAF) as depicted in **Figure 3.32** covers huge area of Europe and Asia continents including the boundaries of 29 countries. It connects the breeding grounds in northern Russia and wintering grounds in the southern Asia. CAF supports about 307 species which also include several species that undertake regular, seasonal movements within the Indian subcontinent[1]. About 20 globally threatened and 10 Near Threatened (IUCN NT) species use this flyway for the annual movements.



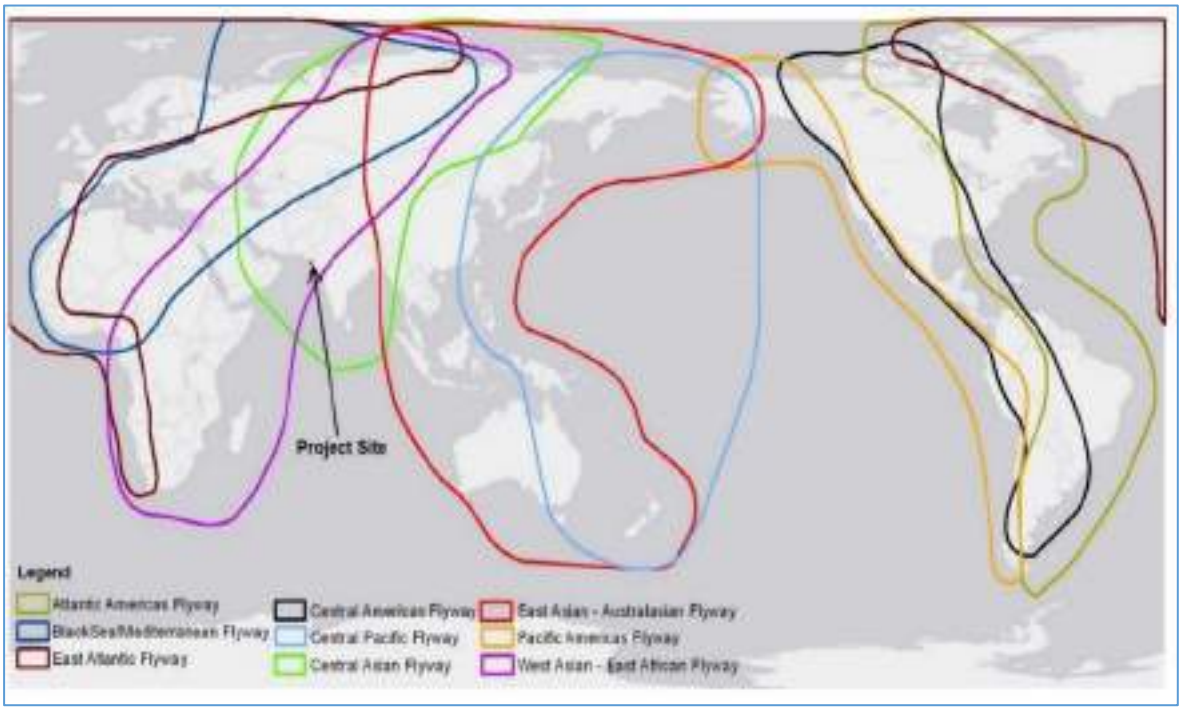
**Source: Birdlife International*

Figure 3.32: Asian Migratory Bird Flyways

[1] Birdlife International, Central Asian Flyway Factsheet

3.9.12.2.1 West Asian-East African Flyway

Through these routes many species of birds migrate annually between mid-Palearctic breeding grounds in Asia and non-breeding sites in eastern and southern Africa and overlaps the boundaries of 64 countries. It also supports the movement of about 20 globally threatened and 13 Near Threatened (IUCN NT) species.



**Source: Wetlands International*

Figure 3.33: Migratory flyways of the world

Thus, the study-area is very likely to be situated in the flight-path of the various winter, summer and passage visitor-birds migrating either to or through the region in which it is situated.

The Migratory bird species sighted during the primary field survey in the study area or water bodies in the command area/ayacut of the study area are listed in **Table 3.88.** The season of migration, the conservation status as per the criteria listed above is also detailed in **Table 3.88.** The species sighted during the field as well as recorded from the secondary sources are also listed in separate column of the Table and are typed in **Bold Letters.**

Table 3.88: Migratory Avifauna Recorded in Study Area During the Study Period

S.No.	Zoological Name	Common name	Order	Migratory Status	IUCN Red List Category	WPA Schedule	CITES Status	CMS Appendix	Observation during Site Survey in Monsoon Season (August, 2019)	Observation during Site Survey in Winter Season (Feb-March, 2020)
1.	*Anthus godlewskii*	Blyth's Pipit	Passeriformes	Winter	LC	IV	--	--	--	**Recorded**
2.	*Merops orientalis*	Asian Green Bee-eater	Coraciiformes	Winter	LC	--	--	--	--	**Recorded**
3.	*Motacilla flava*	Western Yellow Wagtail	Passeriformes	Winter	LC	--	--	--	--	**Recorded**

***** *Status assigned by the International Union for Conservation of Nature and Natural Resources, where -**LC – Least Concern;***

*Sources: R. Grimmett, C. Inskipp & T. Inskipp, Birds of the Indian Subcontinent; Salim Ali, Book of Indian Birds; **IUCN Red Data List, https://www.cites.org/ , www.cms.int/en/species***

Forest Working Plan Mahbubnagar, Nagarkarnool, Nalagonda, Rangareddy, Vikrabad and Narayanpet

Figure 3.34 reveals that a total of 50 resident bird species recorded during both winter & monsoon seasons. Out of the 50 species, 35 resident bird species were recorded in the winter season whereas a total of 43 resident bird species were recorded during the monsoon season.

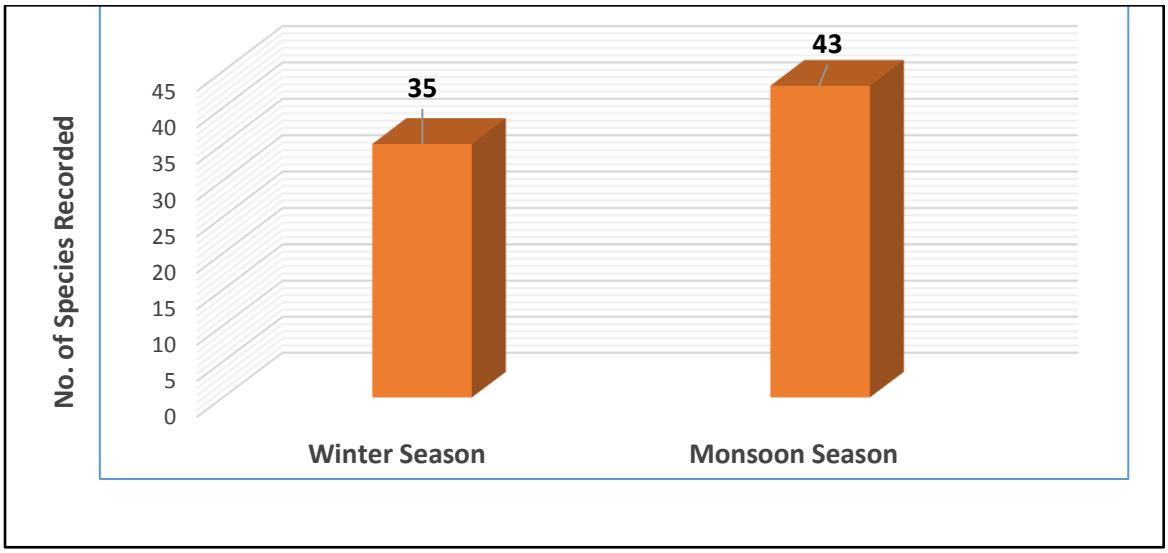


Figure 3.34: Number of Resident Bird Species recorded during Winter & Monsoon Seasons

Species diversity exhibits that the 35-bird species reported in the project study area during the winter season belongs to 13 orders with maximum 18 species (51%) from Order-Passeriformes as presented in **Figure 3.35.** Further, it is revealed that the 43 resident bird species recorded in the study area during the monsoon season belongs to 11 orders with maximum 23 species (53%) from Order-Passeriformes as presented in **Figure 3.36.**

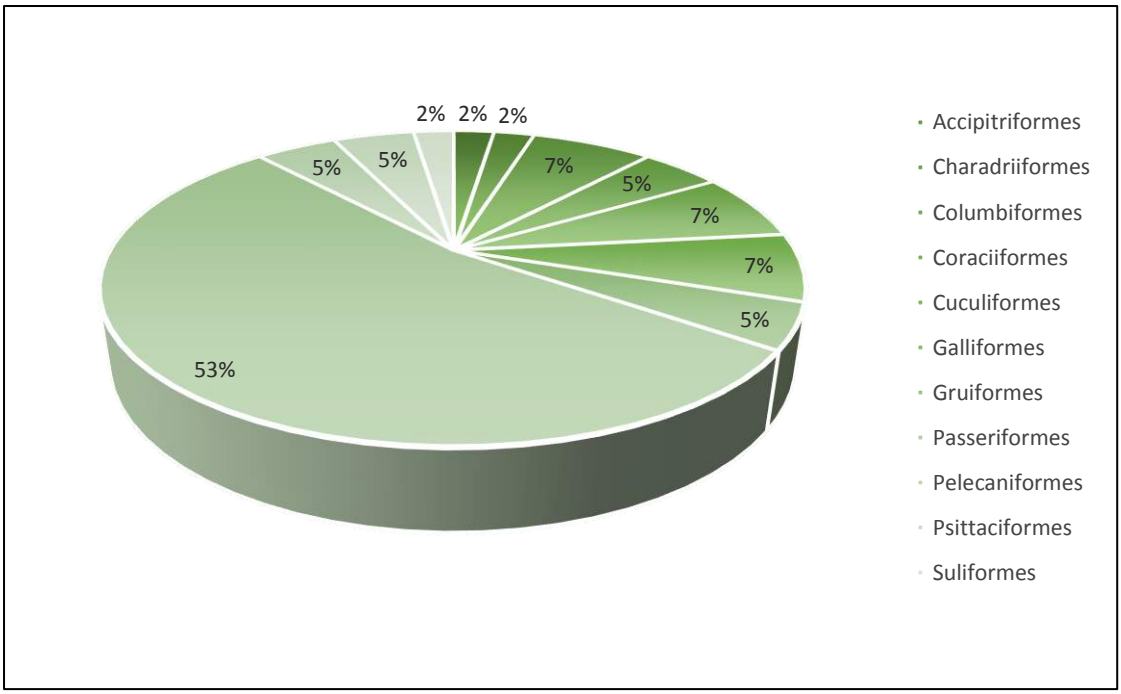


Figure 3.35: Bird Species Diversity of the Study Area during Monsoon Season (August, 2019)

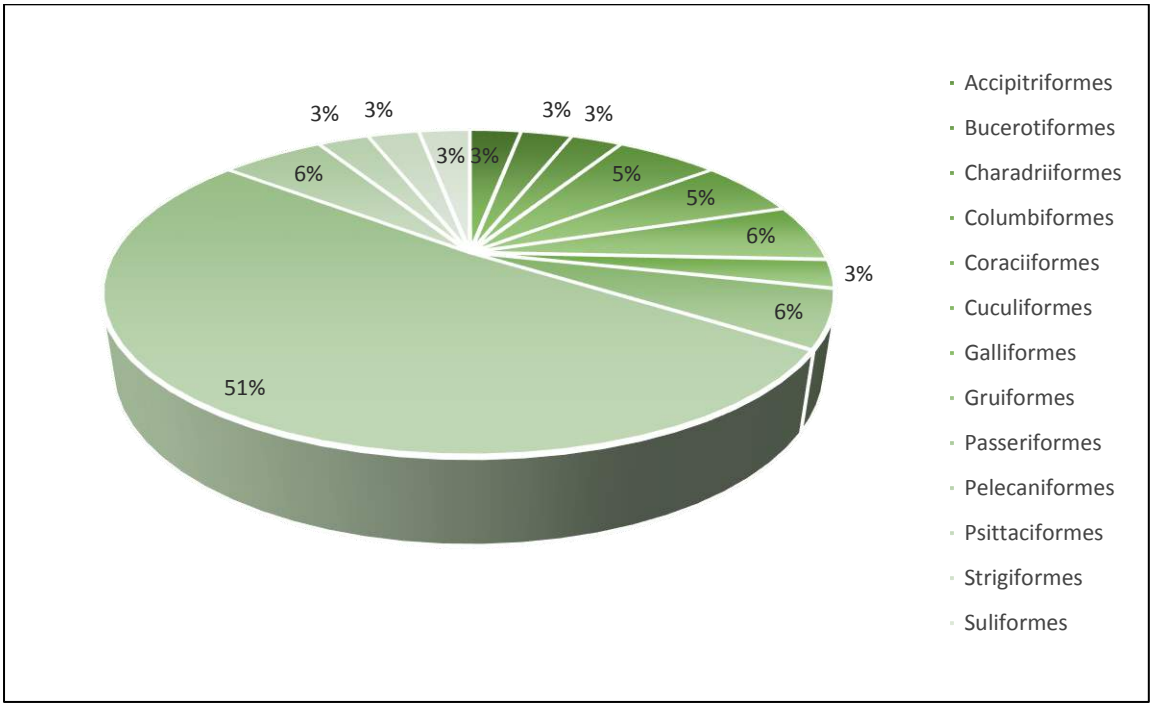


Figure 3.36: Bird Species Diversity of the Study Area during Winter Season (Feb-March, 2020)

3.9.12.3 Herpetofauna

Herpeto-fauna were sampled on the same transects marked for mammals and birds. The following species are recorded from the study area **(Table 3.89).**

Table 3.89: List of Herpetofauna Reported from the Study Area

Sl. No.	Species	Common Name	IUCN Red List Category	WPA, 1972 Schedule
1.	*Mellivora Capensis*	India Ratel	LC	--
2.	*Naja tripudians*	King Cobra	**VU**	Sch II (Part II)
3.	*Viper Russelli*	Viper	--	Sch II (Part II)
4.	*Ptyas mucosa*	Common Rat Snake	--	Sch II (Part II)
5.	*Rana hexadactyla*	Indian Pond Frog	LC	Sch IV
6.	Crocodylus palustris	Mugger Crocodile	**VU**	Sch I (Part I)

Source: Forest Working Plan Rangareddy, Nalgonda & and Mahbubnagar districts, 2003-2004.
IUCN- International Union for Conservation of Nature; WPA – Wildlife (Protection) Act, 1972
** Status assigned by the International Union for Conservation of Nature and Natural Resources, where - LC – Least Concern, VU=Vulnerable, NT=Near Threatened*

3.9.12.4 *Conservation Status of Fauna*

As per IUCN Red list of Threatened Species of Version 2019.3 four mammalian species of vulnerable/near Threatened Category are reported from the study area. According to WPA (1972) also two (04) mammal species are listed in Schedule-I, and six (06) species are listed in Schedule-II.

The data exhibits that, out of 51 Resident Birds species recorded during the study period (monsoon & winter seasons) 06 species falls under species of conservation importance as per

IUCN Red list category, Indian Wildlife (Protection) Act, 1972 (As amended up to, 2006), CITES APPENDIX: I, II and II and; CMS APPENDIX: II.

As estimated, among the 51 resident bird species recorded during the study period (winter & monsoon seasons) only 01 species (Alexandrine Parakeet-*Psittacula eupatria*) belong to "**Near Threatened"** category while 01 species Long Billed Vulture (*Gypes indicus*) is classified under **"Critically Endangered** category of IUCN and the rest of 49 species belongs to **"Least Concern"** category in accordance to IUCN Red list category.

Further 02 species (Indian Peafowl-*Pavo cristatus*) & Long Billed Vulture (*Gypes indicus*) belong to **Schedule I** category of Indian Wildlife (Protection) Act, 1972 (As amended up to, 2006).

Out of the 05 Herpetofauna recorded in the study area one (01) species is listed under vulnerable category of IUCN Red List. While two (03) species are reported as Schedule II species and three (01) specie is listed under Schedule IV of WPA, 1972.

3.9.13 Aquatic Ecology

3.9.13.1 Introduction

Inland freshwater systems such as rivers and lakes harbor high species diversity in terms of plants and animals. These interactive communities not only provide ecological balance to the system, but also designate the ecological state of the system. The species distribution and community structures often indicate the alteration effect and provide cue for mitigation and management solutions. In view of the above, the species richness, distribution and abundance of plankton, benthos and fish communities were assessed at four designated locations within the study area to find out the baseline ecological status of the study locations and predict probable impact of the proposed project activities.

On the basis of reconnaissance surveys, four sites were selected for the assessment. These sites were Foreshore of Srisailam Dam, from where Water shall be extracted for the project, 70 km upstream of Dam (S1), 2. Srisailam reservoir/Dam site 1 (S2), 3. Downstream Srisailam reservoir (S3), and 4. Boinpalli village pond (S4). The sites were designated so as to represent the state of Reservoir, downstream location and end point of the canal (user end). The details of the sites are discussed in the following section.

3.9.13.2 Objectives

The comprehensive surveys were based on the following objectives,

1. To assess the distribution and abundance of different aquatic species (plankton, benthos, fishes).
2. To identify the feeding & breeding grounds of economically important fishes.
3. To assess the existing status of endangered species (if any).

3.9.13.3 Methodology

3.9.13.3.1 Study area and study sites

The descriptions of the study sites are presented in **Table 3.90 and Figure 3.37.,**

AE1: Foreshore of Srisailam Dam (Water Source location of PRLIS project), 70 km upstream of Srisailam Dam

The site is an open water area located at 70 km up-steam of the main reservoir of Srisailam Dam. The site represents deeper section with lentic condition. The bank is a combination of boulder and rocks, and substratum is pebbly. The steep bank is devoid of vegetation and vegetation cover starts at the higher catchment of the site.

AE2: Srisailam Reservoir South side

The site is an open water area located at the southern side of the reservoir. The site is almost 300 m upstream of the dam and represent deeper section with lentic condition. The bank is a combination of boulder and rocks, and substratum is pebbly. The steep bank is devoid of vegetation and vegetation cover starts at the higher catchment of the site.

AE3: Downstream of Reservoir

The site is located at almost 2.5 km downstream of the dam. The slow seepage of water from slow-release water from dam change the condition from lentic to lotic. The flow of the water is slow; however the elevation provides some gradient. This section is also deep with substratum made up of boulders and pebbles. The shoreline id pebbly/cobbles and sandy/silty bank support dense vegetation growth.

AE4: Boinpalli village pond

The site is located almost 93 km (areal distance) from the Srisailam reservoir. This point is the user end of the proposed canal system that will carry irrigation water from the reservoir. The waterbody is a small wetland and gets rejuvenated from seasonal rain. Mostly eutrophic, the pond is shallow wetland system that is the chief water source for the village. The substratum is silty/loamy and upper catchment is surrounded by sparse vegetation.

Table 3.90: Salient features of the study sites

S.No.	Site Code	Sampling site	Geographic coordinates	Location	Water Source
1.	AE 1	70 km Foreshore of Srisailam Reservoir (Water Source location of PRLIS project)	N 16°5'42.68" E 78°23'54.69"	Near Srisailam Dam Museum	Krishna River
2.	AE-2	Srisailam Reservoir South side	N 16° 4'59.97" E 78°53'34.34"	Near APTDC Boating point	Krishna River
3.	AE-3	D/s of Reservoir	N 16° 5'58.87" E 78°54'53.84"	Near Pathalaganga	Krishna River
4.	AE-4	Boinpalli village pond	N 16°44'17.29" E 78°20'56.07"	Boinpalli village	Rain-fed

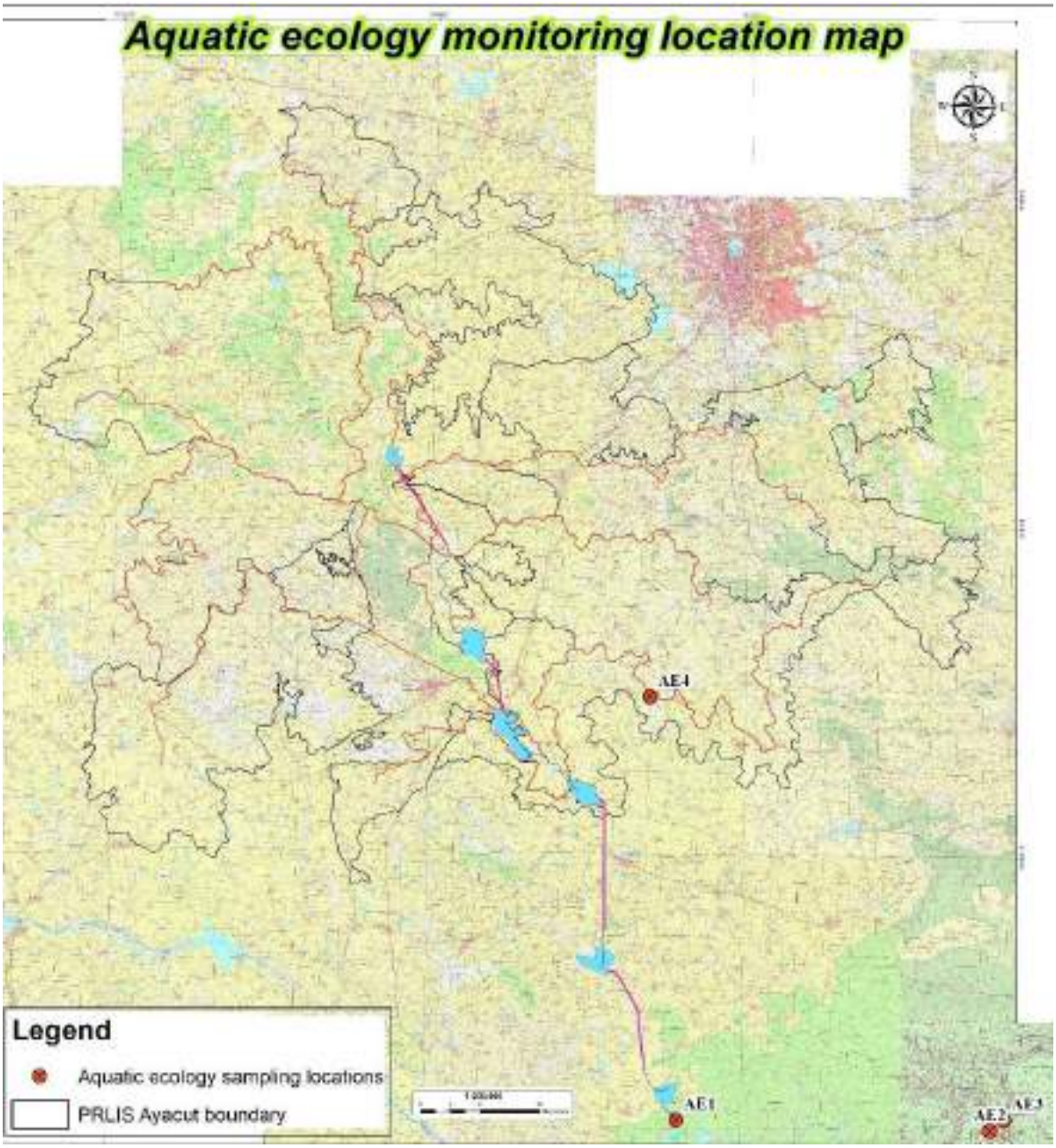


Figure 3.37: Samplings locations for Aquatic Ecology

3.9.13.3.2 Sampling methods

The sampling to assess the biotic diversity and abundance of the plankton, benthos and fish communities, were carried out during August (2019), November (2019) and March (2020) covering the Monsoon, Post-Monsoon and Pre-monsoon seasons, respectively. The methodology adopted for assessment of the ecological state, is described in detail in the following sections.

3.9.13.3.3 Collection, preservation and identification of Phytoplankton

The plankton samples were collected from sub-surface water, at least at 0.3 m depth. In the case of phytoplankton, 500 mL sample water was collected in polyethylene bottles and 1 mL of Lugol's

solution was added for fixation and preservation. The samples were centrifuged and decanted. A volume of 10 ml was collected in double-stoppered amber polyethylene bottles for further qualitative analysis. The species were identified using standard books and monographs (Battish, 1992; Dhanapathi, 2000).

3.9.13.3.4 Collection, preservation and identification of Zooplanktons

The zooplankton samples were collected by filtering 100 liters of sub-surface water through plankton net made up of bolting silk cloth no 20. A sub-sample of 30 mL was collected again, in polyethylene double stoppered bottles and 4-5 drops of formalin and glycerin were added. The samples were stored for further qualitative and quantitative study. The identification of zooplanktons was done up to species in most cases, according to the reference books (Battish, 1992; Dhanapathi, 2000).

3.9.13.3.5 Collection, preservation and identification of Zoo-benthos

Samples were collected with the help of Ekman's dredge, scoop and D-frame nets, as standard practice. The full profile of the bank was collected including substratum for collection of as many zoo-benthos, as possible. Samples were sieved through a sieve having mesh size of 0.5 to 0.6 mm. The benthos was picked and preserved in 4% formalin solution for further identification. Macro-faunal diversity was identified under the Metzer light microscope and highly magnified hand lens with the help of standard keys and manuals (Rao, 1989; Chandra, 1991).

3.9.13.3.6 Collection, preservation and identification of phyto-benthos

The phyto-benthos samples were collected from sub-surface soil under water. The substratum was scrapped and the sediment/soil sample were filtered and collected in polyethylene bottles and 1 mL of Lugol's solution was added for fixation and preservation. The samples were centrifuged and decanted. A volume of 50 ml was collected in amber polyethylene bottles for further qualitative analysis. The species were identified using standard books and monographs (Battish, 1992; Dhanapathi, 2000).

3.9.13.3.7 Collection and identification of fishes

Fishes were captured with the help of local fishermen and the Catch per unit effort (CPUE) method was adopted. Nets were cast and three sample were taken at each sampling site. Both the combination of cast and gill nets were used. The species were identified in the field with the help of field guide Jhingran, 1975. The species that were not identified in the filed were put onto their dorsal side and pictures were taken. Experts were consulted further with photographs and species were identified. All captured fishes were re-released in the site.

3.9.13.4 Results & Discussion

3.9.13.4.1 Status of Phytoplankton community

Phytoplankton are microscopic aquatic plants, occurring as unicellular, colonial or filamentous forms, and are free floated or suspended in open waters. They are photosynthetic organism, primary producers and are grazed by zooplanktons. The phytoplankton community was represented by 47 species in the study area. Irrespective of season, the Chlorophyceae

dominated (20 species), followed by Bacillariophyceae, (16 species). During August 2019 (monsoon), the AE1 and AE2 showed similar species assemblage (Table 3.92) and represented by 46 species, each (Table 3.91). This trend continued during November 2019 (post-monsoon) and March 2020 (pre-monsoon). However, for the AE3 the dominant species of the reservoir were observed in all study duration. The AE4, a distant waterbody showed peculiar phytoplankton community assemblage and due to absence of perennial source of water, lacked most of the species. The community structure is presented in Table 3.92, the seasonal variation in abundance is presented in Table 3.93 and the population density is presented in Table 3.94.

Table 3.91: Spatio-Temporal Variation in Phytoplankton Species Abundance and Distribution

Class	Species	Monsoon (August, 2019)				Post-Monsoon (November, 2019)				Pre-monsoon (March, 2020)			
		AE1	AE 2	AE 3	AE 4	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4
Bacillariophyceae													
1.	*Amphora sp*	++	++	+	-	++	++	++	-	++	+	+	-
2.	*Asteronella sp*	++	++	+	-	++	++	+	+	++	++	+	-
3.	*Bacillaria paradoxa*	++	++	+	-	+++	++	+	-	+++	+++	+	-
4.	*Cyclotella sp*	++	++	+	+	++	++	+	+	++	++	+	-
5.	*Cymbella sp*	++	++	+	+	++	++	+	+	++	++	+	+
6.	*Epithemia sp*	++	++	++	+	++	++	++	+	++	++	++	+
7.	*Fragillaria sp*	++	++	-	-	++	++	+	-	++	++	+	-
8.	*Frustula sp*	++	++	++	+	++	++	++	+	++	++	++	+
9.	*Gomphonema sp*	+	++	++	-	++	++	++	-	++	+	++	-
10.	*Hanzchia sp*	++	++	++	+	++	++	++	+	++	++	++	-
11.	*M. pseudofilamentasa*	++	++	++	-	++	++	++	-	++	++	++	-
12.	*Melosira sp*	++	++	++	-	++	++	++	-	++	++	++	-
13.	*Nitzschia sp*	++	++	++	+	++	+++	+	+	++	+++	+	+
14.	*Pinnularia sp*	++	++	+	+	++	++	+	+	+	++	+	-
15.	*Stauratrum sp*	+++	++	+	-	++	++	+	-	++	+	+	-
16.	*Tabellaria sp*	++	++	+	-	++	++	+	-	++	++	+	-
Chlorophyceae													
17.	*Ankistrodesmus gracillis*	+++	++	+	+	++	+++	+	+	++	+++	+	-
18.	*A.hantzschii*	++	++	++	-	++	++	++	-	+	++	++	-
19.	*A. spiralis*	++	++	+	-	++	+++	+	-	++	+++	+	-
20.	*Botryococcus brauni*	++	++	++	+	++	++	++	+	+++	+++	++	+
21.	*C.cambrium*	++	++	++	-	++	++	++	-	++	++	++	-
22.	*Crucigenia crucifera*	+	++	-	+	+	++	+	+	+	+	-	+
23.	*C.reticulatum*	++	++	+	-	++	++	++	-	++	++	++	-
24.	*Chlorella sp*	++	++	+	-	+++	++	+	-	++	++	+	-
25.	*Chlorococcum humicola*	++	++	++	+	++	++	++	+	++	++	++	-
26.	*Closterium longissima*	++	+	++	+	++	+++	++	+	++	+	+	-
27.	*Coelastrum*	++	++	+	+	++	++	++	+	++	++	++	+

Class	Species	Monsoon (August, 2019)				Post-Monsoon (November, 2019)				Pre-monsoon (March, 2020)			
		AE1	AE 2	AE 3	AE 4	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4
	microporum												
28.	*Crucigenia tetrapaedia*	+	+	+	+	+	+	++	+	++	+	++	+
29.	*Denticulla sp*	++	++	+	+	++	++	++	+	++	++	++	+
30.	*Euastrum denticulatum*	+++	+++	++	-	++	++	++	-	++	++	++	
31.	*O.curviceps*	++	++	+	-	++	++	+	-	++	++	+	-
32.	*Oedogonium sp*	++	++	++	-	++	++	++	-	++	++	+	-
33.	*Oocystis crassa*	++	++	++	+	++	++	++	-	++	++	++	-
34.	*Scenedesmus alterans*	+	+	+	-	++	++	++	-	++	++	+	-
35.	*Ulothrix sp*	+	+	+	-	+	++	+	-	+	+	+	-
36.	*Volvox sp*	-	-	+	+	-	-	+	+	-	-	+	+
Cyanophyceae													
37.	*Anabaena sp*	++	++	+	+	++	++	+	+	++	++	+	+
38.	*Merismopedia sp*	++	++	++	+	++	++	++	+	++	++	++	+
39.	*Microcystis aeruginosa*	+	++	+	+	++	++	+	++	+	+	+	+
40.	*Mougeotia sp*	++	++	++	+	++	++	++	+	++	++	++	+
41.	*Merismopedia sp*	++	++	+	-	++	++	+	+	++	++	+	-
42.	*Oscillatoria sp*	+	+	-	-	++	++	+	-	+	++	+	-
43.	*Pleodorina sp*	++	++	++	-	++	++	++	-	++	++	++	-
44.	*Rivularia aquatica*	++	++	+	-	++	++	+	-	++	+	+	-
Euglenaphyceae													
45.	*Euglena acus*	++	+	+	+	+	+	+	+	+	+	+	+
46.	*Euglena oxyuris*	+	+	+	+	+	++	+	+	++	++	-	-
47.	*Tetradon sp*	+	+	+	+	+	+	+	+	+	+	+	+

- = Absent, + = Present, ++= Common, +++ = Abundant

Table 3.92: Spatio-Temporal Variation in The Abundance of Phytoplankton Community Abundance and Distribution

Class	Species abundance during Monsoon (August, 2019)				Species abundance during Post-Monsoon (November, 2019)				Species abundance Pre-monsoon (March, 2020)			
	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4
Bacillariophyceae	16	16	15	7	16	16	16	8	16	16	16	4
Chlorophyceae	19	19	19	10	19	19	19	9	19	19	19	6
Cyanophyceae	8	8	7	4	8	8	7	5	8	8	7	4
Euglenophyceae	3	3	3	3	3	3	3	3	3	3	2	2
Total	**46**	**46**	**44**	**24**	**46**	**46**	**45**	**25**	**46**	**46**	**44**	**16**

3.9.13.4.2 Status of Zooplankton community

Zooplanktons are microscopic aquatic animals, free floated and suspended in open or pelagic waters. In natural aquatic ecosystem, zooplanktons are heterotrophic and comprise of the first consumer level of the trophic structure of any aquatic ecosystem. The zooplanktons were represented by 23 species (Table 3.94). Upstream of reservoir site (AE1 & AE2) were predominant with Protozoa and Rotifers represented by seven species each (Table 3.95). The downstream location AE3 was also under the influence of the zooplankton communities of the reservoir. However, site S4 was dissimilar in community composition. August 2019 (monsoon), the AE1 and AE2 showed similar species assemblage (Table 3.93) and represented by 23 species, each (Table 3.95). This trend continued during November 2019 (post-monsoon) and March 2020 (pre-monsoon). However, for the AE3 the dominant species (22 nos.) of the reservoir were observed in all study duration. The S4, a distant waterbody showed peculiar phytoplankton community assemblage and due to absence of perennial source of water, lacked most of the species (range 11-12). The abundance of species is presented in Table 3.94 and the seasonal variation in abundance in the community level is presented in Table 3.95.

As was represented by community structure, the density of the phytoplanktons varied in a similar fashion, and ranged from 4.4-4.8 X 10^4 /L for S1, which is among the highest in all sites (Table 3.96). Zooplankton density was highest at AE2 which ranged from 375 to 386 (Table 3.96). The site-wise density of phyto- and zooplanktons are presented in Table 3.96.

Table 3.93: Spatio-Temporal Variation in Zooplankton Species Abundance and Distribution

Taxa	Species	Monsoon (August, 2019)				Post-Monsoon (November, 2019)				Pre-monsoon (March, 2020)			
		AE 1	AE 2	AE 3	AE 4	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4
Protozoa													
1.	*Arcella discoides*	++	++	++	-	++	++	++	-	++	+++	++	-
2.	*Arcella vulgaris*	++	++	++	+	++	++	++	+	++	++	++	+
3.	*Centrocypris sp*	++	++	++	+	++	++	++	++	++	++	++	+
4.	*Centropyxis sp*	++	++	++	-	++	++	++	-	++	++	++	-
5.	*Centropyxis aculeate*	++	++	++	+	++	+++	++	+	++	+++	++	+
6.	*Difflugia sp*	++	+++	++	+	++	+++	++	+	++	++	++	+
7.	*Paramecium sp*	++	++	++	-	++	+++	++	-	++	+++	++	-
Rotifera													
8.	*Asplancha sp*	++	++	++	+	++	++	++	+	++	++	++	+
9.	*Brachionus bidentata*	++	++	+	+	++	++	+	+	++	++	+	+
10.	*Brachionus calyciflorus*	++	+++	++	+	++	++	++	+	+++	++	++	-
11.	*Brachionus falcatus*	++	++	+	-	++	++	++	-	++	++	+	-
12.	*Brachionus patulus*	+++	++	++	+	+++	+++	++	+	++	++	++	+
13.	*Keratella tropica*	++	++	++	+	+++	+++	++	+	++	++	++	+
14.	*Testudinella sp.*	+	++	+	-	+	++	+	-	+	++	+	-
Copepoda													
15.	*Mesocyclops*	+	+	+	+	+	+	+	+	+	+	+	+
16.	*Phyllodiaptomus*	+	+	+	-	+	+	+	-	++	+	+	-

Taxa	Species	Monsoon (August, 2019)				Post-Monsoon (November, 2019)				Pre-monsoon (March, 2020)			
		AE 1	AE 2	AE 3	AE 4	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4
17.	*Cyclops sp*	+	+	+	-	+	++	+	-	+	+	+	-
18.	*Diaptomus sp*	+	+	+	+	++	++	+	+	+	+	+	+
Cladocera													
19.	*Alona sp*	+	+	+	-	+	+	+	-	+	++	+	-
20.	*Bosmina sp*	++	+	+	-	++	++	+	-	+	+	+	-
21.	*Cypris sp*	+	++	+	-	+	++	+	-	+	+	+	-
22.	*Daphnia sp*	+	+	+	+	+	+	-	++	+	+	-	+
23.	*Polyphemus*	++	++	+	-	++	++	+	-	++	++	+	-

- = Absent, + = Present, ++= Common, +++ = Abundant

Table 3.94: Spatio-Temporal Variation in The Abundance of The Phytoplankton Community Abundance and Distribution

Taxa	Species abundance during Monsoon (August, 2019)				Species abundance during Post-Monsoon (November, 2019)				Species abundance during Pre-Monsoon (March,2020)			
	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4
Protozoa	7	7	7	4	7	7	7	4	7	7	7	4
Rotifera	7	7	7	5	7	7	7	5	7	7	7	4
Copepoda	4	4	4	2	4	4	4	2	4	4	4	2
Cladocera	5	5	5	1	5	5	4	1	5	5	4	1
Total	**23**	**23**	**23**	**12**	**23**	**23**	**22**	**12**	**23**	**23**	**22**	**11**

Table 3.95: Spatio-Temporal Variation in The Population Density of Plankton Community

Plankton community	Population density during Monsoon (August, 2019)				Population density during Post-Monsoon (November, 2019)				Population density during Pre-Monsoon (March, 2020)			
	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4
Phytoplankton (No. of Species X 10^4/L)	4.6	4.7	3.1	1.6	4.8	4.7	3.6	2.1	4.4	4.6	3.3	1.4
Zooplankton (No. of individuals /L)	340	375	232	86	358	386	240	72	328	378	214	65

3.9.13.4.3 Status of Phyto-benthos community

The phyto-benthos community was represented by 16 species belonging to Bacillariophyceae, Chlorophyceae and Myxophyceae (Table 3.96). The community was predominated by Chlorophyceae, and represented by nine species. The phyto-benthos in the upstream samples (AE1, AE2) were similar in community composition (Table 3.99) and were represented by 15 to 16 species.

Table 3.96: Spatio-Temporal Variation in Phyto-Benthos Species Abundance and Distribution

S. No.	Taxa	Monsoon (August, 2019)				Post-Monsoon (November, 2019)				Pre-monsoon (March, 2020)			
		AE1	AE2	AE	AE	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4

				3	4								
	Bacillariophyceae												
1.	*Diatoma sp.*	+	++	++	+	+	+	+	+	+	++	++	+
2.	*Navicula sp.*	+	+	+	-	+	+	+	-	++	+	+	-
3.	*Achnanthes sp*	++	++	+	-	+	+	+	-	++	+	+	-
4.	*Cocconeis sp.*	+	-	-	-	+	+	+	+	-	-	-	-
	Chlorophyceae												
5.	*Clorococcus sp.*	+	+	+	-	+	+	+	-	+	+	+	-
6.	*Closterium sp.*	+	++	-	-	++	++	-	-	+	++	-	-
7.	*Chlorella sp.*	+++	+++	++	++	++	++	++	++	+++	++	++	+
8.	*Tetrapedia sp.*	++	++	+	-	++	++	+	-	++	++	+	-
9.	*Euglena acus*	++	++	++	+	++	++	++	++	++	+	++	+
10.	*Ulothrix sp.*	++	++	+	-	++	++	+	-	++	++	+	-
11.	*Crucigenia sp.*	++	++	-	-	++	++	-	-	+++	++	-	-
12.	*Spirogyra*	+	+	+	++	+++	+++	+	++	+	+	+	++
13.	*Hydrodictyon sp.*	++	++	-	-	++	++	-	-	++	++	-	-
	Myxophyceae												
14.	*Nostoc sp.*	++	++	++	-	++	++	++	-	++	++	++	-
15.	*Oscillatoria sp.*	++	+	+	+	++	++	+	+	+	+	+	+
16.	*Gomphosphaeria sp.*	+	+	+	++	+	+	+	++	+	+	+	+

- = Absent, + = Present, ++= Common, +++ = Abundant

3.9.13.4.4 Status of Zoo-benthos community

The zoo-benthos community was represented by 25 species belonging to Phyla Arthropoda, Annelida and Mollusca (Table 3.97). The community was predominated by Arthropoda and were represented by 19 species. The zoo-benthos in the samples (AE1 & AE2) were similar in community composition (Table 3.98) and were represented by 17 to 19 species. The high abundance and density of phytoplankton in the water enables high assemblages of zoo-benthos in the reservoir. The site AE3 had a pebble/cobble substratum and therefore, was represented by flow-tolerating species. The site AE4 was isolated and frequented by runoffs. The higher organic content enabled proliferation of Chironomid larvae and annelids in the water (Table 3.98).

Table 3.97: Spatio-Temporal Variation in Zoo-Benthos Species Abundance and Distribution

S. No.		Monsoon (August, 2019)				Post-Monsoon (November, 2019)				Pre-monsoon (March, 2020)			
	Taxa	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4
	Phylum Arthropoda												
1.	Chironomidae	-	-	-	++	-	-	-	++	-	-	-	+++
2.	Tanabidae	++	++	+	-	++	++	+	-	++	++	+	-
3.	Culicidae	-	-	-	+	-	-	-	+	-	-	-	+
4.	Tipulidae	+	+	+	-	++	++	+	-	+	+	+	-
5.	Notonectidae	+	+	+	-	++	++	++	-	+	+	+	-
6.	Hydrometridae	+	+	+	-	++	++	+	-	+	+	+	-
7.	Philopotamidae	+	+	+	-	+	+	++	-	+	+	+	-
8.	Dytiscidae	+	+	-	+	++	+	-	+	++	++	+	+
9.	Sialidae	+	+	-	-	++	+	-	-	++	++	-	-
10.	Ephemerellidae	+	+	-	-	+	+	-	-	+	+	-	-

S. No.	Taxa	Monsoon (August, 2019)				Post-Monsoon (November, 2019)				Pre-monsoon (March, 2020)			
		AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4
	Phylum Arthropoda												
11.	Pothaminthidae	-	+	-	-	-	+	-	-	-	+	-	-
12.	Palaemonidae	++	++	-	-	++	++	-	-	++	++	-	-
13.	Psephenidae	+	+	+	+	++	++	+	+	++	++	+	+
14.	Libellulidae	+	+	+	-	++	++	++	-	++	++	+	-
15.	Aeschnidae	+	+	+	+	++	++	+	++	++	++	+	+
16.	Haliplidae	+	+	+	-	+	+	+	-	-	-	-	-
17.	Hydrophilidae	++	++	+	+	++	++	+	+	++	++	+	+
18.	Gomphidae	+	+	+	++	+	+	+	++	+	+	+	++
19.	Gammaridae	+	+	+	+	+	+	+	+	+	+	+	+
	Phylum Annelida												
20.	Polychaeta	-	-	-	+	-	-	-	+	-	-	-	+
21.	Nanididae	-	-	+	+	-	-	+	+	-	-	-	+
22.	Tubificidae	-	-	+	++	-	-	+	++	-	-	+	++
23.	Lumbriculidae	-	-	+	+	-	-	+	+	-	-	+	+
	Phylum Mollusca												
24.	Vivparidae	++	++	++	++	++	++	++	++	++	++	++	++
25.	Lymnaeidae	+	+	-	+++	+	+	-	+++	+	+	-	++

- = Absent, + = Present, ++= Common, +++ = Abundant

Table 3.98: Spatio-Temporal Variation in The Species Abundance of The Benthos

Taxa	Monsoon (August, 2019)				Post-Monsoon (November, 2019)				Pre-monsoon (March, 2020)			
	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4
Zoo-benthos	18	19	16	14	18	19	16	14	17	18	15	14
Phyto-benthos	16	15	12	6	16	16	13	7	15	15	12	6

3.9.13.4.5 Status of Fish community

The Srisailam reservoir upper Krishna complex are regularly stocked, mainly with Indian Major Carps (IMCs), thereby maintaining sustainable production with availability of fish in their lotic sectors as well. About 2.93 lakh fish seedlings of Catla and Rohu species were released into the backwaters of Srisailam reservoir under the Rashtriya Krishi Vikas Yojana (RKVY). The fish seedlings come to harvest in six months. During current survey, a total of 16 species including IMCs were captured from the study sites (Table 3.100). Most of the species were Least Concern according to IUCN Red List. Mrigal, Catla and Rohu were predominant in the reservoir irrespective of seasons. This is due to the ranching exercises that are being carried out in the reservoir.

The families were dominated by Cyprinidae and were represented by six species. The monsoon and post-monsoon catch in the reservoir sites (AE1 & AE2) showed almost similar species composition due to breeding season and represented by 12 species. *Catla catla* is a major species of fishery in the Srisailam reservoir. The site AE3 had some elements from the reservoir, however

lacked the IMCs throughout the study duration. The site AE4 is isolated from any river system, and therefore mainly represented by species of Channidae family.

3.9.13.4.6 Fish Breeding site

The Reservoir is a ranching area and fingerlings of IMCs were often released for aquaculture and commercial fisheries purpose. However, the habitat in the reservoir provided breeding opportunities for the native fishes, however, no specific fish breeding ground was observed during the current survey. The site AE3 is downstream rapid and shallow water area, and fish species found in that section of the river may not find the habitat suitable for breeding. The site AE4 was a pond and was not connected to any river. The pond was inhabited by very few fish species, however, small-scale breeding may occur in the pond. As there was no commercial fishing activity in the pond and only subsistence fishing by locals was supported, it was inferred that, the pond was not a prolific breeding ground.

3.9.13.4.7 Fish migration

No anadromous or catadromous species of fish was captured during the study, and therefore, disruption in fish migration was not predicted due to project activities. However, the canal system might enhance the habitat availability for certain species and improve the distribution pattern in the surrounding area.

Table 3.99: Spatio-Temporal Variation in Fish Species Abundance and Distribution

S. No.	Fish species	Scientific name	IUCN Red List	Monsoon (August, 2019)				Post-Monsoon (November, 2019)				Pre-monsoon (March, 2020)			
				AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4	AE1	AE2	AE3	AE4
	Family Cobitidae														
1.	Guntia Loach	*Lepidocephalichthys guntea*	LC	+	+	+	-	+	+	+	-	+	+	+	-
	Family Nemacheilidae														
2.	Telangana Loach	*Indoreonectes telanganaensis*	NE	++	++	+	-	++	++	+	-	+	+	+	-
	Family Cyprinidae														
3.	Mrigal Carp	*Cirrhinus mrigala*	LC	+++	+++	-	-	++	++	-	-	++	+++	-	-
4.	Catla	*Catla catla*	LC	+++	+++	-	-	+++	+++	-	-	++	+++	-	-
5.	Deccan Labeo	*Labeo kawrus*	LC	++	++	+	-	+++	+++	+	-	++	+	+	-
6.	Roho Labeo	*Labeo rohita*	LC	+++	+++	-	-	+++	+++	-	-	+++	+++	-	-
7.	Boga Labeo	*Labeo boga*	LC	++	++	++	-	++	++	++	-	++	++	++	-
8.	Stone Roller	*Tariqilabeo latius*	LC	-	-	+	-	-	-	+	-	-	-	+	-
	Family Danionidae														
9.	Slender Rasbora	*Rasbora daniconius*	LC	+	+	+	-	+	+	+	-	+	+	+	-
	Family Bagridae														
10.	Krishna Mystus	*Hemibagrus maydelli*	LC	++	++	+	-	++	++	+	-	++	++	+	-
11.	Long Whiskered Cat-fish	*Sperata aor*	LC	++	++	-	-	+++	+++	-	-	++	++	-	-
	Family Pangasiidae														
12.	Pangas Catfish	*Pangasius pangasius*	LC	++	++	+	-	++	++	+	-	++	++	+	-
	Family Channidae														
13.	Spotted Snakehead	*Channa punctata*	LC	-	-	-	+	-	-	-	+	-	-	-	+
14.	Striped Snakehead	*Channa striata*	LC	-	-	-	+	-	-	-	+	-	-	-	+
	Family Poeciliidae														
15.	Mosquito Fish	*Gambusia affinis*	LC	-	-	-	+	-	-	-	+	-	-	-	+
	Family Mugilidae														
16.	Corsula	*Rhinomugil corsula*	LC	+	+	+	+	+	+	+	+	+	+	+	-

LC—Least Concern | NE—Not Evaluated

3.9.13.4.8 Fisheries

The present section provides an overview of the fish composition and fisheries based on secondary literature survey in the Krishna River & Srisailam Reservoir. The secondary data pertaining to fisheries in Krishna River & Srisailam Reservoirwere collected from various publicly available literature and research papers. It was observed during field visit, no large-scale fishing activities are being practiced by the population in and around the project area. During interaction with the local inhabitants and Fisheries Department, Mahbubnagar, Nalgonda and Rangareddy districts. It was confirmed that there are no permanent fishermen in the project area. However, few locals are involved in fishing activities to augment their income. No family is fully dependent on fishery for their livelihood and income generation. The fisheries are done mostly for subsistence. Fish species reported in the area are presented in **Table 3.100.**

Table 3.100: List of Important Fish Species Found in Study Area

Sl. No.	1. Species	2. Common name	IUCN Red List Category
3.	*Bagarius beggaries*	Devil Catfish	5. NT
4.	*Catla cattle*	Catla	8. LC
5.	*Cirrhinus mrigal*	Mirgal	11. NA
6.	*Clarias batrachus*	Walking Catfish	14. LC
7.	*Heteropneustes fossilis*	Asian stinging catfish	17. LC
8.	*Hypselobarbus jerdoni*	Jerdon's Carp	20. LC
9.	*Labeo calbasu*	Karnataka Labeo	23. LC
10.	*Labeo rohita*	Rohu	26. LC
11.	*Mystus cavasius*	Gangetic Mystus	29. LC
12.	*Mystus tengra*	Tengara catfish	32. NA
13.	*Mystus vittatus*	Striped Dwarf Catfish	35. LC
14.	*Ompok bimaculatus*	Butter Catfish	38. NT
15.	*Ompok pabda*	Pabdah catfish	41. NT
16.	*Oreochromis mossambicus*	Mozambique Tilapia	44. NT
17.	*Salmophasia bacaila*	Large Razorbelly Minnow	47. LC

***Source:** http://www.fisheriesjournal.com/archives/2015/vol2issue5/PartB/2-5-61.pdf*

IUCN- International Union for Conservation of Nature; WPA – Wildlife (Protection) Act, 1972

** Status assigned by the International Union for Conservation of Nature and Natural Resources, where - **LC – Least Concern, NT=Near Threatened, NA: Not Assessed***

3.9.13.4.9 Riparian Vegetation

Riparian vegetation is an important component of the aquatic ecosystem because it on the one hand, provides shade and cover to the fish on the other hand, helps to regulate the temperature of the river or stream. The important riparian vegetation observed in the project areas along the river banks of the river is presented in **Table 3.101.**

Table 3.101: Important Riparian Vegetation Observed Along River

Common Name	Botanical Name	Family
TREES		
Vepa	*Azadirachta indica*	Meliaceae
Guggilamu	*Boswellia serrata*	Burseraceae
Modugu	*Butea monosperma*	Fabaceae

Common Name	Botanical Name	Family
TREES		
Rela	*Cassia fistula*	Fabaceae
Getregi	*Dalbergia latifolia*	Fabaceae
Pachari	*Dalbergia paniculata*	Fabaceae
Gumpena	*Lannea coromandelica*	Anacardiaceae
Korivi	*Lepisanthes tetraphylla*	Sapindaceae
Velaga	*Limonia acidissima*	Rutaceae
Alla Neredu	*Syzygium cumini*	Myrtaceae
Teak	*Tectona grandis*	Lamiaceae
Erumaddi	*Terminalia arjuna*	Combretaceae
Tanikaya	*Terminalia bellirica*	Combretaceae
SHRUBS		
Addarsham	*Adhatoda zeylanica*	Acanthaceae
Jilledu	*Calotropis gigantea*	Apocynaceae
Nepalam	*Jatropha curcas*	Euphorbiaceae
Konda Papidi	*Tarenna asiatica*	Rubiaceae
Bankitutthuri	*Triumfetta rotundifolia*	Tiliaceae
Indhuvara	*Vitex negundo*	Lamiaceae
HERBS		
Nelavemu	*Andrographis paniculata*	Acanthaceae
Chandra Poda	*Argyreia sericea*	Convolvulaceae
Cheepuru Gaddi	*Aristida setacea*	Poaceae
Gadidagdapa	*Aristolochia bracteolata*	Aristolochiaceae
Adavinabhi	*Gloriosa superba*	Colchicaceae

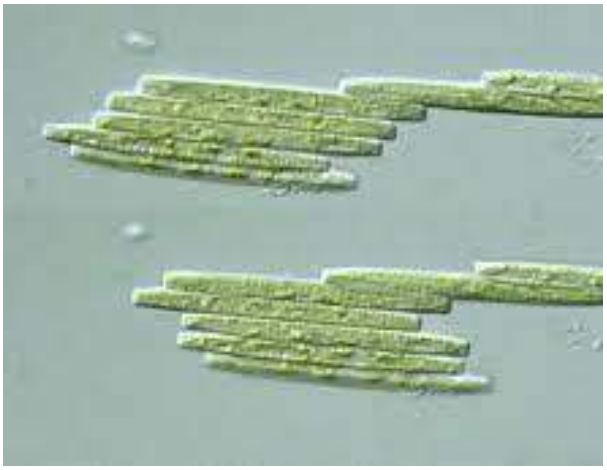
3.9.13.5 Conclusion

The biodiversity of aquatic micro- and macro-fauna indicated that the upstream areas (AE1 & AE2) support unique assemblages and the food web was supported by the habitat. The water regime in the downstream site AE3 was dependent on the release water from dam and some of the biotic elements of the reservoir was populating the habitat. The site AE4 was isolated from any perennial river system, and therefore rain-fed. The water regime was seasonal and could not support much diversity.

Plate 1

Ankistrodesmus sp.

Arcella vulgaris



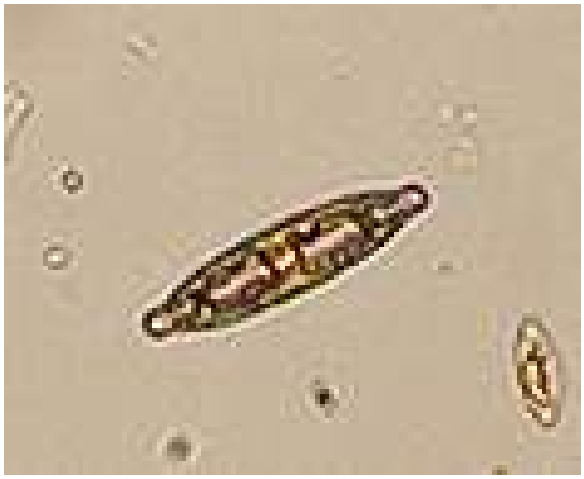
Bacillaria paradoxa

Brachionus patulus

Nizchia sp.

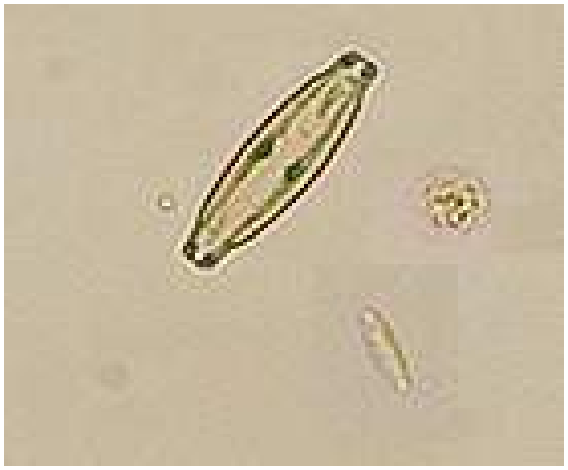
Daphnia sp.

Plate 2



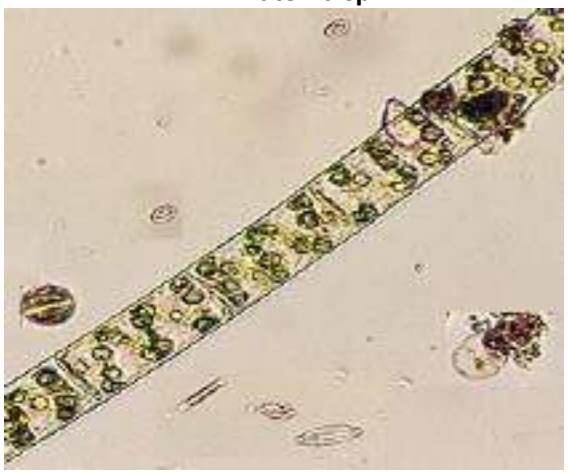
Navicula sp.

Libellulidae



Diatoma sp.

Lymnaeidae



Spirogyra sp.

Chironomidae larvae

Plate 3

Labeo rohita

Lepidocephalichthys guntea

Sperata aor

3.10 SOCIO-ECONOMIC ENVIRONMENT

The development projects are invariably planned based on the availability of exploitable natural resources. These projects attract flow of finances, investments, jobs and other livelihood opportunities, which brings in people from diverse cultural and social background. Such planned activities not only provide impetus to the local economy but also bring about a multi-dimensional economic, social and cultural change. Most often it has been observed that such development projects are commissioned in economically and socially backward areas, which are inhabited by some of the indigenous populations. The development of irrigation facilities unfortunately herald's displacement of local people due to formation of reservoir and land required for the project components. This unpleasant situation is mainly caused due to the agricultural land and settlements being situated near the river banks and due to location of the proposed diversion structures across the river bed and the formation of reservoir at higher levels generally cause submergence of private land and assets besides forests and revenue land as well as land required for development of canal irrigation. This un-toward situation brings heavy stress into the life of the indigenous people residing in the project area from centuries. The hapless persons are often socio-economically wracked if they are not rehabilitated and resettled and are allowed to continue their traditional activities even after resettlement. The plight of such persons who do not have rights over the land on which they are critically dependent for their bare subsistence becomes gory. The obtaining situation calls for proper assessment of the adverse impact such as economic and socio-cultural on project affected families.

The present socio-economic assessment involves primary field survey of socio-economic status of the people of the study area in general and the project affected villages and the PAF in general. Review of secondary data, such as District Census Statistical Handbooks-2016 and the records of National Informatics Centre data, for the parameters of demography, occupational structure of people within the study area which mainly comprises of the villages, where the project area is located as per revenue records. The information in this context was gathered on the following socio-economic parameters viz.

- Demographic profile
- Educational levels
- Occupational Profile
- Cropping pattern
- Other socio-economic parameters

3.10.1 Details of The Districts Falling Under the Ayacut Area

Mahbubnagar:

Erstwhile Mahabubnagar is the largest in the district and 7th most populous in the state. Mahabubnagar is located at 16.73°N 77.98°E. It has an average elevation of 498 metres (1633 feet). The city of Mahabubnagar is located at a distance of 98 km from Hyderabad 108 km from Kurnool.

Narayanpet:

The district has been created on 17th February,2019, and has an area of 2336 sq.km. There are 11 mandals in the district.

Nalgonda:

Nalgonda city is the headquarters of the Nalgonda district, as well as the headquarters of the Nalgonda mandal in the Nalgonda revenue division. The municipality of Nalgonda was categorized as a "Grade-III municipality" when it was first created in 1941. It is now a "Special Grade Municipality."

Nalgonda's jurisdictional area is spread over 105 km2 (41 sq mi). Its population is distributed over an area of 123.54 km2 (47.70 sq mi), which includes residents of the municipality Nalgonda, the rural areas of Panagallu, Gollaguda, Cherlapalli, Arjalabhavi, Gandhamvarigudam, and Marriguda.

Rangareddy

Rangareddy district is one of the 31 districts in the Indian state of Telangana. The district headquarters are located at Shamshabad. The district was named after the former deputy chief minister of the joint state of Andhra Pradesh, Konda Venkata Ranga Reddy. The district shares boundarieswith Nalgonda, Yadadri, Hyderabad, Medchal, Nagarkurnool, Mahabubnagar, Sangar eddy and Vikarabad districts.

Vikarabad

Vikarabad is the headquarter of the district. It was a part of Rangareddy district before the re-organization of districts in the state.

Nagarkurnool

Nagarkurnool district is covered in the southern region of Telangana has been carved out of Mahabubnagar district. It has three revenue divisions Nagarkurnool, Achampet, Kalwakurthy and with total twenty mandals.

3.10.2 Population Details of All District and Mandals Covering Ayacut

The total number of households in the command area of the project is estimated to be 7,71,354 and majority (31.3%) of these households is in Rangareddy district with 2,67,218 followed by Mahabubnagar and Vikarabad districts with 2,40,003 (31.1%) and 1,74,397 (22.6%) households respectively (**Table3-102**). Lowest number of households is there in the command area of Nalgonda district. The total population of these households is estimated to be 35,61,580 consisting of 17,98,712 males and 17,62,869 females. The average size of the household in the command area is assessed to be 4.62 persons per household and the same is maximum in Mahabubnagar district at 4.92 persons per household and minimum in Nalgonda district at 4.11 persons per household. At the aggregate level sex ratio of the command area is 980 females per 1000 males. The same is in the range of 951 in Rangareddy district to 1000 in Vikarabad district.

Table 3.102:Details of Population of Districts

S No	District	Total Population					
		No. of HH	Total	Male	Female	HH Size	Sex Ratio
1	Mahabubnagar and Narayanpet	240,003	1,180,333	592,090	588,244	4.92	994
2	Nagarkurnool	95,479	417,799	211,090	206,709	4.38	979
3	Nalgonda	19,938	82,026	41,541	40,485	4.11	975
4	Rangareddy	241,537	1,053,571	540,032	513,539	4.36	951
5	Vikarabad	174,397	827,851	413,959	413,892	4.75	1,000
Total		**771,354**	**3,561,580**	**1,798,712**	**1,762,869**	**4.62**	**980**

3.10.3 Caste Wise Distribution of Population

Table 3.103 provides composition of total population of command area in terms of SCs and STs. The total population of SCs in the command area is estimated to 6,67,434 persons and this population accounted for 18.7% of the total population of the command area. The share of SC population in total population of command area is in the range of 15.8% in Mahabubnagar district to 20.4% in Vikarabad district. The ST population in the command area accounted for 10.5% of total population. The share of ST population is highest at 11.3% in the command area of the project in Vikarabad district and lowest at 10.0% in Rangareddy district. The sex ration among SC household in the command area of the project is higher at 1002 females per 1000 males as compared to the same (980 females per 1000 males) for the total population of the command area. The sex ratio among the ST households is lower at 947 females per 1000 males as compared to the same for the total population of the command area.

Table 3.103: Caste Wise Distribution of Population

Sl. No.	New District	SC Population				ST Population			
		Total	Male	Female	% Total SC	Total	Male	Female	% Total ST
1	Mahabubnagar and Narayanpet	186,216	91,851	94,365	15.8%	125,092	63,764	61,328	10.6%
2	Nagarkurnool	85,269	42,724	42,545	20.3%	42,699	22,076	20,623	10.2%
3	Nalgonda	15,728	7,894	7,834	19.2%	9,084	4,752	4,332	11.1%
4	Rangareddy	211,091	107,311	103,780	20.0%	104,985	54,627	50,358	10.0%
5	Vikarabad	169,130	83,586	85,544	20.4%	93,512	47,502	46,010	11.3%
Total		667,434	333,366	334,068	18.7%	375,372	192,721	182,651	10.5%

The total population of Scheduled Cast and Scheduled Tribe in mandals of Ayacut is 6,67,434 (18.7%) and 3,75,372(10.5%) respectively **(Table 3.104).** The highest percentage of SC and ST in mandals in command area is under Vikarabad district, being 20.4% and 11.3% respectively. The lowest percentage of SC in mandals in command area is under Mahabubnagar district, being 20.4%. The lowest percentage of ST in mandals in command area is under Rangareddy district, being 10.0%.

Table 3.104: Caste Wise Distribution of Population in Mandals Under Ayacut

Sl.No.	District/Mandal	SC Population				ST Population			
		Total	Male	Female	%	Total	Male	Female	%
A- Erstwhile Mahabubnagar									
1	Addakal & Moosapet	7,100	3,551	3,549	13.6	2,722	1,426	1,296	5.2
2	Balanagar & Rajapur	10,878	5,429	5,449	16.3	20,892	10,898	9,994	31.3
3	Bhoothpur	8,011	4,039	3,972	16.1	5,026	2,520	2,506	10.1
4	Damaragidda	10,742	5,296	5,446	18.5	2,567	1,296	1,271	4.4
5	Devarkadra	8,191	4,141	4,050	14.0	1,091	546	545	1.9%
6	Dhanwada & Marikal	10,713	4,982	5,731	16.7	5,089	2,645	2,444	7.9
7	Hanwada	8,084	4,050	4,034	14.7	10,355	5,253	5,102	18.8
8	Jadcherla	14,821	7,106	7,715	14.4	12,154	6,201	5,953	11.8
9	Koilkonda	8,842	4,432	4,410	13.3	12,747	6,460	6,287	19.1
10	Kosgi	9,333	4,596	4,737	16.2	3,134	1,621	1,513	5.5
11	Maddur	11,026	5,544	5,482	16.4	8,529	4,278	4,251	12.7
12	Mahbubnagar	12,114	6,066	6,048	13.3	10,322	5,216	5,106	11.3
13	Makthal	11,319	5,523	5,796	15.7	503	249	254	0.7
14	Midjil	8,438	4,149	4,289	23.6	2,792	1,384	1,408	7.8
15	Narayanpet	9,219	4,577	4,642	16.4	5,650	2,843	2,807	10.1
16	Narva	7,669	3,791	3,878	15.5	1,987	974	1,013	4.0
17	Nawabpet	9,436	4,766	4,670	18.1	6,100	3,131	2,969	11.7
18	Utkoor	9,953	4,841	5,112	17.8	814	411	403	1.5
19	Gandeed	10,327	4,972	5,355	14.7	12,618	6,412	6,206	17.9
Total Mahabubnagar		186,216	91,851	94,365	15.8	125,092	63,764	61,328	10.6
B -Nagarkurnool									
1	Bijinapalle	13,261	6,634	6,627	18.3	8,662	4,435	4,227	11.9
2	Kalwakurthy	12,532	6,284	6,248	19.6	4,640	2,585	2,055	7.2
3	Nagarkurnool	14,067	7,014	7,053	18.8	860	436	424	1.2
4	Urkonda	8,036	3,951	4,085	23.6	2,659	1,318	1,341	7.8
5	Tadoor	8,862	4,435	4,427	23.1	1,311	667	644	3.4
6	Thimmajipet	7,764	3,861	3,903	19.2	6,855	3,520	3,335	17.0
7	Vangoor	10,575	5,432	5,143	21.1	6,737	3,435	3,302	13.4
8	Veldanda	10,172	5,113	5,059	22.1	10,975	5,680	5,295	23.9
Total Nagarkurnool		85,269	42,724	42,545	20.3	42,699	22,076	20,623	10.2
C-Nalgonda									
1	Chintha Palle	8,925	4,464	4,461	19.8	5,615	2,925	2,690	12.5
2	Marriguda	6,803	3,430	3,373	18.4	3,469	1,827	1,642	9.4
Total Nalgonda Mandals		15,728	7,894	7,834	19.2	9,084	4,752	4,332	11.1
D-Rangareddy									
1	Amangal & Kadthal	9,270	4,779	4,491	14.9	17,716	9,404	8,312	28.6
2	Farooqnagar	14,964	7,467	7,497	13.3	11,607	6,028	5,579	10.3
3	Keshampet	8,904	4,523	4,381	20.9	4,163	2,133	2,030	9.8
4	Kondurg & Chowdarigudem	13,889	7,026	6,863	23.0	4,004	2,078	1,926	6.6
5	Kothur & Nandigama	10,418	5,253	5,165	16.0	6,172	3,180	2,992	9.5
6	Madgul	10,728	5,394	5,334	21.8	8,060	4,196	3,864	16.4

Sl.No.	District/Mandal	SC Population				ST Population			
		Total	Male	Female	%	Total	Male	Female	%
7	Talakondapalle	11,006	5,624	5,382	20.8	11,063	5,708	5,355	20.9
8	Chevella	12,577	6,329	6,248	21.6	377	186	191	0.6
9	Ibrahimpatnam	17,107	8,629	8,478	23.1	2,484	1,203	1,281	3.4
10	Kandukur	13,139	6,704	6,435	24.1	4,351	2,334	2,017	8.0
11	Maheswaram	12,968	6,622	6,346	19.9	10,014	5,339	4,675	15.4
12	Manchal	7,937	4,098	3,839	17.1	10,433	5,406	5,027	22.4
13	Moinabad	13,784	7,269	6,515	24.5	240	135	105	0.4
14	Shabad	11,766	5,937	5,829	22.9	1,781	917	864	3.5
15	Shamshabad	15,968	8,077	7,891	18.2	6,134	3,060	3,074	7.0
16	Shankarpalle	14,190	7,175	7,015	21.7	2,085	1,042	1,043	3.2
17	Yacharam	12,476	6,405	6,071	25.3	4,301	2,278	2,023	8.7
Total Rangareddy		211091	107311	103780	20.0	104985	54627	50358	10.0
E-Vikarabad									
1	Bomraspet	8,199	4,036	4,163	14.7	15,198	7,641	7,557	27.2
2	Doulathabad	9,426	4,655	4,771	18.3	4,247	2,131	2,116	8.2
3	Kodangal	10,420	5,130	5,290	19.4	2,972	1,484	1,488	5.5
4	Bantwaram	9,713	4,785	4,928	29.3	1,218	636	582	3.7
5	Basheerabad	7,058	3,479	3,579	16.2	7,986	4,027	3,959	18.3
6	Dharur	8,366	4,041	4,325	18.6	5,588	2,840	2,748	12.4
7	Doma	8,361	4,126	4,235	17.3	8,479	4,319	4,160	17.6
8	Kulkacharla	8,598	4,375	4,223	12.2	18,557	9,740	8,817	26.4
9	Marpalle	13,811	6,794	7,017	27.0	2,329	1,258	1,071	4.6
10	Mominpet	12,464	6,181	6,283	28.8	3,137	1,622	1,515	7.3
11	Nawabpet_V	11,985	6,076	5,909	29.0	187	89	98	0.5
12	Pargi	12,758	6,212	6,546	20.3	4,891	2,435	2,456	7.8
13	Peddemul & Kotipally	9,755	4,795	4,960	18.8	8,902	4,487	4,415	17.2
14	Pudur	11,225	5,677	5,548	25.0	1,478	732	746	3.3
15	Tandur	9,881	4,837	5,044	18.4	2,780	1,370	1,410	5.2
16	Vicarabad	8,273	4,135	4,138	25.6	1,897	918	979	5.9
17	Yelal	8,837	4,252	4,585	19.5	3,666	1,773	1,893	8.1
Total Vikarabad Mandal		169130	83586	85544	20.4	93512	47502	46010	11.3
Grand Total		667434	333366	334068	18.7	375372	192721	182651	10.5

3.10.4 Literacy Rate

Literacy rate is one of the most significant indicators of human and social development. This not only reflects the educational attainment of the population but also reflects on the status of women, caste equation and economic condition of a particular area. It also shows the skill level of the people and their capability to get trained and work. The literacy rate of male and female is given in **Table 3.105** to describe the total and gender- wise literacy rate of the people in the Study Area.

Population of literates in the command area of PRLIS is estimated to be 17,44,413 and the population in the age group of above 6 years of command area is 31,05,465. The literacy rate in

the command area of the project is 56.2%. The literacy rate in the command area is in the range of 53.1% in command area in Mahabubnagar district to 60.9% in command area of Rangareddy district.

Table 3.105: Literacy Rate in Command Area of Project

SN	New District	Literacy				
		Total Population	Population in the age group 0-6	Population in the age group above 6	Literates Population	Literacy Rate
1	Erstwhile Mahabubnagar	1,180,333	158,851	1,021,482	542,886	53.1%
2	Nagarkurnool	417,799	52,346	365,454	200,630	54.9%
3	Nalgonda	82,026	9,688	72,338	41,134	56.9%
4	Rangareddy	1,053,571	131,523	922,048	561,615	60.9%
5	Vikarabad	827,851	103,708	724,143	398,148	55.0%
Total		**3,561,580**	**456,116**	**3,105,465**	**1,744,413**	**56.2%**

3.10.5 Working Population

In the study area, people are mainly involved in agricultural and animal husbandry. Majority of the families in the area are small farmers with limited resources. Due to lack of proper irrigation facility, people are heavily dependent on rainfall. The traditional agricultural practices and fragmented land in the area result in limited output of the produce. Thus, people are shifting to non-agricultural activities in the tertiary sector.

The total number of main and marginal workers in command area mandals of the project is estimated to be 15,42,482 and 279,908 persons respectively. The district wise classification of main workers and marginal workers according to four-fold classification of workers viz., cultivators, agricultural labourers, HH industries workers and others, is presented in Table 10.19. Agricultural labourers accounted for maximum of the total main and marginal workers with 5,97,119 (39%) and 181,642 (65%) workers respectively. Cultivators accounted for 35% and 9% of total main and marginal workers in command area mandals respectively. Agricultural labourers accounted for maximum of total main workers in the command area of all districts except for Vikarabad district wherein cultivators accounted for maximum. The occupational structure of the study area population as per census classification is provided in **Table 3.106** and **Table 3.107.**

Table 3.106: Distribution of Main Workers in Four Categories of Economic Activities

Name of District & Mandal	Main Workers				
	Cultivators	Agricultural Labourers	HH Industries Workers	Other Workers	Total Main Workers
Erstwhile Mahabubnagar					
Addakal & Moosapet	5,106	10,807	706	6,628	23,247
Balanagar & Rajapur	10,626	11,303	493	6,442	28,864
Bhoothpur	5,649	8,767	389	5,525	20,330
Damaragidda	12,024	10,497	572	3,043	26,136
Devarkadra	6,505	13,436	384	6,112	26,437
Dhanwada & Marikal	8,338	13,499	1,565	6,007	29,409

Name of District & Mandal	Main Workers				
	Cultivators	Agricultural Labourers	HH Industries Workers	Other Workers	Total Main Workers
Hanwada	7,888	12,194	216	5,531	25,829
Jadcherla	9,956	12,887	924	18,096	41,863
Koilkonda	10,694	15,866	631	5,982	33,173
Kosgi	9,706	10,256	765	5,575	26,302
Maddur	11,263	10,793	335	3,518	25,909
Mahbubnagar	5,181	9,901	635	19,568	35,285
Makthal	9,172	11,117	457	7,094	27,840
Midjil	7,569	6,230	288	2,434	16,521
Narayanpet	7,063	13,356	1,356	5,080	26,855
Narva	6,853	12,237	533	3,906	23,529
Nawabpet	9,159	10,241	294	4,655	24,349
Utkoor	6,142	9,546	804	4,831	21,323
Gandeed	10,968	13,942	604	4,625	30,139
Total Mahabubnagar	**159,862**	**216,875**	**11,951**	**124,652**	**513,340**
Nagarkurnool					
Bijinapalle	8,441	17,309	783	7,280	33,813
Kalwakurthy	9,863	9,706	548	9,538	29,655
Nagarkurnool	8,310	10,884	784	11,499	31,477
Urkonda	6,881	5,664	262	2,213	15,020
Tadoor	10,597	6,596	225	2,789	20,207
Thimmajipet	6,970	8,831	297	2,947	19,045
Vangoor	11,934	9,054	317	4,141	25,446
Veldanda	9,746	9,893	217	3,729	23,585
Total	72,742	77,937	3,433	44,136	198,248
Nalgonda					
Chintha Palle	4,548	10,030	319	4,221	19,118
Marriguda	3,701	8,126	273	2,883	14,983
Total Nagarkurnool	**8,249**	**18,156**	**592**	**7,104**	**34,101**
Rangareddy					
Amangal & Kadthal	8,893	8,985	424	9,282	27,584
Farooqnagar	8,957	11,875	1,306	18,981	41,119
Keshampet	7,563	8,110	337	3,654	19,664
Kondurg & Chowdarigudem	13,535	11,230	258	3,963	28,986
Kothur & Nandigama	8,591	7,054	554	11,191	27,390
Madgul	9,255	8,965	455	4,045	22,720
Talakondapalle	9,941	9,219	583	3,673	23,416
Chevella	15,359	9,353	295	3,444	28,451
Ibrahimpatnam	4,515	8,440	666	13,033	26,654
Kandukur	8,283	9,648	369	5,526	23,826
Maheswaram	8,015	7,573	391	9,887	25,866
Manchal	4,115	8,081	420	6,342	18,958
Moinabad	8,425	6,489	344	7,173	22,431

Name of District & Mandal	Main Workers				
	Cultivators	Agricultural Labourers	HH Industries Workers	Other Workers	Total Main Workers
Shabad	9,830	7,265	282	3,389	20,766
Shamshabad	5,354	7,987	685	17,241	31,267
Shankarpalle	12,149	7,479	565	6,273	26,466
Yacharam	5,307	7,414	446	6,127	19,294
Total Rangareddy	**148,087**	**145,167**	**8,380**	**133,224**	**434,858**
Vikarabad					
Bomraspet	15,175	7,885	437	3,612	27,109
Doulathabad	10,797	9,425	480	3,194	23,896
Kodangal	6,758	9,242	568	4,388	20,956
Bantwaram	9,420	6,638	146	1,191	17,395
Basheerabad	5,212	8,028	962	3,214	17,416
Dharur	9,784	7,814	500	2,624	20,722
Doma	9,403	8,648	331	2,989	21,371
Kulkacharla	12,311	10,020	482	4,535	27,348
Marpalle	10,331	9,164	256	2,467	22,218
Mominpet	7,775	8,605	168	2,723	19,271
Nawabpet_V	10,505	7,126	170	2,273	20,074
Pargi	11,789	8,804	453	5,471	26,517
Peddemul & Kotipally	8,843	11,000	408	3,328	23,579
Pudur	10,443	6,142	291	2,296	19,172
Tandur	3,878	7,147	676	8,683	20,384
Vicarabad	9,694	4,517	234	1,727	16,172
Yelal	6,229	8,779	371	2,956	18,335
Total Vikarabad	**158,347**	**138,984**	**6,933**	**57,671**	**361,935**
Grand Total	**547,287**	**597,119**	**31,289**	**366,787**	**1,542,482**

Table 3.107: Distribution of Marginal Workers in Four Categories of Economic Activities

Name of District & Mandal	Marginal Workers				
	Cultivators	Agricultural Labourers	HH Industries Workers	Other Workers	Total Marginal Workers
Erstwhile Mahabubnagar					
Addakal & Moosapet	248	3,025	133	1,006	4,412
Balanagar & Rajapur	522	3,477	199	1,127	5,325
Bhoothpur	241	3,949	183	1,030	5,403
Damaragidda	537	4,377	285	1,235	6,434
Devarkadra	233	2,783	94	1,068	4,178
Dhanwada & Marikal	506	2,347	398	1,036	4,287
Hanwada	170	2,808	54	769	3,801
Jadcherla	289	2,262	186	2,163	4,900
Koilkonda	341	1,931	185	547	3,004
Kosgi	197	2,227	121	564	3,109

Name of District & Mandal	Marginal Workers				
	Cultivators	Agricultural Labourers	HH Industries Workers	Other Workers	Total Marginal Workers
Maddur	1,378	8,436	252	1,058	11,124
Mahbubnagar	290	2,370	121	2,346	5,127
Makthal	285	6,172	133	1,399	7,989
Midjil	186	1,271	64	395	1,916
Narayanpet	186	2,887	272	804	4,149
Narva	185	2,947	325	999	4,456
Nawabpet	284	2,096	93	524	2,997
Utkoor	310	5,139	512	1,639	7,600
Gandeed	1,090	3,111	242	1,579	6,022
Total	7,478	63,615	3,852	21,288	96,233
Nagarkurnool					
Bijinapalle	625	3,099	259	1,545	5,528
Kalwakurthy	107	1,118	89	655	1,969
Nagarkurnool	198	2,254	146	1,626	4,224
Urkonda	169	1,155	58	359	1,741
Tadoor	64	674	49	280	1,067
Thimmajipet	315	2,187	66	440	3,008
Vangoor	397	1,590	55	616	2,658
Veldanda	385	1,515	95	355	2,350
Total	2,260	13,592	817	5,876	22,545
Nalgonda					
Chintha Palle	236	2,985	257	646	4,124
Marriguda	109	3,631	82	369	4,191
Total	345	6,616	339	1,015	8,315
Rangareddy					
Amangal & Kadthal	247	1,726	79	769	2,821
Farooqnagar	447	5,911	238	3,028	9,624
Keshampet	290	2,152	53	376	2,871
Kondurg & Chowdarigudem	407	1,847	86	777	3,117
Kothur & Nandigama	227	2,069	150	980	3,426
Madgul	433	2,333	193	621	3,580
Talakondapalle	446	3,765	144	900	5,255
Chevella	243	1,284	35	346	1,908
Ibrahimpatnam	380	1,716	118	1,807	4,021
Kandukur	390	2,607	122	723	3,842
Maheswaram	298	2,683	92	685	3,758
Manchal	510	2,000	196	1,264	3,970
Moinabad	178	2,363	54	1,174	3,769
Shabad	590	4,278	117	1,176	6,161
Shamshabad	316	2,717	183	2,566	5,782
Shankarpalle	345	3,624	180	1,337	5,486
Yacharam	533	3,507	126	886	5,052

Name of District & Mandal	Marginal Workers				
	Cultivators	Agricultural Labourers	HH Industries Workers	Other Workers	Total Marginal Workers
20 Manda	6,280	46,582	2,166	19,415	74,443
Vikarabad					
Bomraspet	362	2,473	92	580	3,507
Doulathabad	378	3,932	180	796	5,286
Kodangal	373	3,882	215	835	5,305
Bantwaram	302	1,043	81	228	1,654
Basheerabad	399	3,535	263	1,665	5,862
Dharur	303	2,150	160	596	3,209
Doma	1,145	3,073	273	699	5,190
Kulkacharla	1,179	5,020	201	1,861	8,261
Marpalle	496	3,475	85	490	4,546
Mominpet	490	2,961	33	454	3,938
Nawabpet_V	394	1,569	32	508	2,503
Pargi	648	2,762	185	1,002	4,597
Peddemul & Kotipally	652	2,682	118	1,114	4,566
Pudur	1,016	2,682	74	841	4,613
Tandur	399	4,330	272	1,947	6,948
Vicarabad	350	1,497	60	1,009	2,916
Yelal	249	4,171	173	878	5,471
Total	9,135	51,237	2,497	15,503	78,372
Grand Total	25,498	181,642	9,671	63,097	279,908

3.10.6 Size Distribution of Land Holdings Benefiting From PRLIS Command

The distribution of landholdings according to size of holding in the districts of the command area of the project and the percentage share of different land holding sizes is given in Table 10.6. Majority (50%) of holdings in project command mandals belong to the marginal farmers (less than 1 ha) followed by small farmers (1-2 ha), which account for about 27.1 percent of total holdings. Further, an analysis of the size distribution of holdings shows that the small and marginal farmers constitute 77 percent of the total cultivators with an average size 0.51 Ha and 1.42 ha respectively, holding 41.6 percent of the total cultivated area. The share of semi-medium farmers (2.0-4.0 ha size) are 16.3 percent and 28.30 percent of the total cultivated area with an average size of 2.68 Ha. The Medium farmers in (4.0-10 ha) are 5.8 percent who are holding 21.9 percent of the total cultivated area with an average size of 5.77 ha. The farmers in the size holdings of above 10.0 ha are negligible with 0.80 per cent but holds 8.6 per cent of total cultivated low with an average size of 16.00 ha holding. The total average size of the holding in the command area is 1.55 ha, while the average size of 1.12 ha in the entire state of Telangana. Refer Table 10.6 for district wise details.

Out of all 5 project command districts, the maximum (53%) number of Marginal Farmers (Below 1 ha) found in Mahabubnagar district where as maximum (29.1 %) number of Small Farmers (1 - 2 ha) observed in Nalgonda district. Interestingly, maximum (1.1%) number of Large Farmers

was also found in Nagarkurnool district. The total holdings in command area mandals is 11,24,457 ha and of which 497,976 ha is going to be benefited with PRLIS i.e., about 44.3% of cultivable lands. Farmer class/size wise distribution is given in **Table 3.108.**

Table 3.108: Size Distribution of Land Holdings in PRLIS Command

S No	Category Particulars		Mahabubnagar	Nagarkurnool	Nalgonda	Rangareddy	Vikarabad	Total Command
	No. of Mandals		22	8	2	20	18	70
1	Marginal Farmers (Below 1 ha)	No	119,783	43,240	9,643	106,256	86,612	365,535
2		Area, ha	59,168.1	22,784.9	5,151.1	53,641.9	45,613.1	186,359.2
3		Ave. Size	0.49	0.53	0.53	0.50	0.53	0.51
4	Small Farmers (1 - 2 ha)	No	58,749	27,067	6,358	54,578	50,994	197,746
5		Area, ha	83,372.1	38,720.4	9,020.6	77,415.0	72,440.4	280,968.6
6		Ave. Size	1.42	1.43	1.42	1.42	1.42	1.42
7	Semi Medium Farmers (2 - 4 ha)	No	34,073	17,665	4,041	33,959	29,343	119,080
8		Area, ha	91,260.0	47,435.3	10,843.9	90,746.4	78,427.1	318,712.7
9		Ave. Size	2.68	2.69	2.68	2.67	2.67	2.68
10	Medium Farmers (4 - 10 ha)	No	11,516	6,607	1,585	12,497	10,370	42,574
11		Area, ha	67,129.8	38,390.3	9,034.0	71,854.8	59,437.2	245,846.1
12		Ave. Size	5.83	5.81	5.70	5.75	5.73	5.77
13	Large Farmers (10.01 ha and above)	No	1,705	1,104	196	1,733	1,341	6,078
14		Area, ha	25,652.6	16,201.9	3,033.6	27,473.4	20,209.7	92,571.1
15		Ave. Size	15.05	14.68	15.48	15.85	15.07	15.23
16	Total	No	225,825	95,682	21,823	209,023	178,660	731,014
17		Area, ha	326,582.7	163,532.8	37,083.2	321,131.6	276,127.5	1,124,457.8
18		Ave. Size	1.45	1.71	1.70	1.54	1.55	1.54

3.10.7 Social Class Wise Distribution of Farmers Benefiting From PRLIS Command

Social class wise estimated benefiting farmers indicates that the share of SC and STs is 29.2% and majority is BCs with 40.8%. The general category accounts to around 30.0%. Details of the same are furnished in the table below. The overall estimated benefiting population is about 15.21 lakhs and of which majority are from Mahabubnagar (37%) followed Rangareddy and Vikarabad with 27% each. The loest is from Nalgonda with 2% of total benefiting poupation (**Table 3.109**).

Table 3.109: Social Class Wise Distribution of Farmers in PRLIS Command

Social Class	Mahabubnagar	Nagarkurnool	Nalgonda	Rangareddy	Vikarabad	Total Command	%
General	37,371	6,975	2,441	29,101	22,175	98,063	30.0%
BC	47,564	10,038	2,541	37,037	36,181	133,360	40.8%
SC	18,176	4,961	1,370	18,931	17,462	60,900	18.6%
ST	12,210	2,484	791	9,415	9,655	34,555	10.6%
Total	**115,321**	**24,458**	**7,143**	**94,484**	**85,473**	**326,879**	**100.0%**

Benefiting Population	**567,069**	**107,014**	**29,387**	**412,134**	**405,735**	**1,521,339**	

3.10.8 Area Under Different Crops in Command Area District

The major crops grown in Mahabubnagar district are Redgram (22.41%) followed by Cotton (21.70%). The high-water consuming crops like Rice and Sugarcane accounts for 19.3% and 0.25% of the gross cropped area of the district respectively. Two crops namely Cotton (39.20%) and Maize (31.69%) accounted for over 70.89% of gross cropped area in Nagarkurnool district. The high-water consuming crops like Rice and Sugarcane account for 6.00% and 0.02% of the gross cropped area of the district respectively. In Nalgonda district Cotton (50.25%) and Rice (31.29%) are major crops grown in the district together accounting for over 81.54% of gross cropped area. The Share of Horticulture crops is about 8.43%. The high-water consuming crop like Sugarcane accounts for 0.23% of the gross cropped area of the district. In Rangareddy district the major crops grown is Cotton (30.52% %) followed by Maize (26.23%). The high-water consuming crops like Rice and Sugarcane account for 12.78% and 0.20% of the gross cropped area of the district respectively. The Share of Horticulture crops is higher at about 24%. In Vikarabad district the major crops grown in the district are red gram (22.71%) and Cotton (22.55%). The high-water consuming crops like Rice and Sugarcane accounts for 9.30% and 1.04% of the gross cropped area of the district respectively. The Share of Horticulture crops is about 15%. Crop-wise details of districts are shown in **Table3.110.**

Table 3.110: District Wise Area Under Different Crops

S.N.	Crop	Mahabubnagar		Nagarkurnool		Nalgonda		Rangareddy		Vikarabad	
		Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
1	Rice	63,180	19.28	12,752	6.00	212,730	31.29	27,840	12.78	17,788	9.30
2	Jowar	13,412	4.09	2,685	1.26	2,162	0.32	4,621	2.12	6,660	3.48
3	Maize	39,687	12.11	67,304	31.69	2,540	0.37	57,136	26.23	29,081	15.21
4	Red gram	73,424	22.41	5,126	2.41	21,831	3.21	4,665	2.14	43,428	22.71
5	Green gram	4,632	1.41	0	0.00	21,873	3.22	3	0.00	6,207	3.25
6	Black gram	577	0.18	0	0.00	941	0.14	0	0.00	3,883	2.03
7	Bengalgram	567	0.17	224	0.11	226	0.03	1,721	0.79	2,885	1.51
8	Groundnut	26,725	8.16	19,158	9.02	11,770	1.73	1,923	0.88	7,216	3.77
9	Sunflower	1,535	0.47	53	0.02	12	0.00	526	0.24	116	0.06
10	Chillies	157	0.05	346	0.16	5,286	0.78	140	0.06	415	0.22
11	Sugarcane	816	0.25	42	0.02	1,574	0.23	438	0.20	1,997	1.04
12	Cotton	71,108	21.70	83,274	39.20	341,655	50.25	66,477	30.52	43,129	22.55
13	Horticulture	31,883	9.73	21,451	10.10	57,348	8.43	52,350	24.03	28,424	14.86

3.10.9 Extent of Land (Public / Private), Houses and Other Assets to Be Acquired

The total Private (Patta land) and Government land required for the main canal and for distribution system shall be 13,092 ha and 2,698 ha respectively **(Table 3.111).** No residential structure, shop and cattle shed shall be acquired.

Table 3.111: District Wise Land to be Acquired for Canal Network

S.N.	District	PAF	Private (**Patta land) to be acquired** (ha)	**Total Private**	**Govt. Land**	**Total Land**

			Main Canal	Branches Distributaries and Minors	land (ha)	(ha)	
1	Mahabubnagar	3027	1681	1750	3431	339	3770
2	Narayanpet	1019	566	485	1051	104	1155
3	Nagarkurnool	1195	870	560	1430	124	1554
4	Nalgonda	185	0	200	200	10	210
5	Rangareddy	3670	1877	1802	3679	395	4074
6	Vikarabad	5795	1201	2100	3301	1726	5027
Total		**14,891**	**6,195**	**6,897**	**13,092**	**2698**	**15790**

CHAPTER 4 ANTICIPATED IMPACT & MITIGATION MEASURES

Identification and prediction of impacts are the most important aspects in EIA studies. The main purpose of collecting environmental baseline data of study area is to predict the effects of project before it's carried out so that new plan may be designed accordingly. The key areas for which impacts are identified are Land environment, Water resources, Water quality, Terrestrial ecology, Aquatic ecology, ambient air quality, ambient noise levels and Socio-economic aspects.

In light of the predicted impacts, various mitigation measures are suggested emphasizing to avoid/ minimize its negative impacts. The quantum and magnitude of an impact is assessed based on its nature, viz. positive/ negative, reversible/ irreversible, short term (confined to construction phase)/ long term (remains in operational phase), local/ strategic, adverse/ beneficial and significant/ insignificant.

In irrigation projects, most activities occur in the construction phase and decreases significantly thereafter. Considering this, impact identification has been divided broadly into two categories, viz. impacts during the construction phase and impacts during operational phase. Impacts due to project location have also been discussed in the chapter. Wherever possible, anticipated impacts have been quantified and otherwise, qualitative assessment has been undertaken.

4.1 IMPACTS DUE TO PROJECT LOCATION AND MITIGATION

Environmental impacts before in initiating construction activities are identified during the planning phase. This happens due to identification of the project in a location which may be susceptible to adverse impacts due to natural environmental conditions. Impacts of the project due to its location are as follows:

(i) Loss of land

(ii) Geological Risk

(iii) Risk due to seismicity & earthquake

(iv) Loss to forest

4.1.1 Loss of Land

The total land requirement for entire project shall be 28273 ha comprised of 12483 ha and 15790 ha for Phase-I &Phase-II respectively. The apportionment between Government, Patta and forest land requirement under Phase-I shall be 2768.86 ha, 9508.60ha and 205.54 ha respectively whereas for Phase-II it shall be 2698 ha, 13092ha and nil ha respectively.

Therefore, due to the project, there shall be loss of 22600.60 ha agricultural land either due to submergence or owing to other project works like digging of canals and consequently loss of production from the land. The project affected families shall be adequately compensated for land loss and cost of land to be acquired as per provision under RFCT_LARR 2013.

4.1.2 Geological Risk

Considering the past earthquake and tectonic history, it can be presumed that there is little or

no likelihood of occurrence of high magnitude (more than 5.0 ML) earthquake in the project area. The project site, which is covered under erstwhile Mahabubnagar, Rangareddy and Nalgonda districts, is distinctly located in Zone II which is a Low Damage Risk Zone (MSKVI or less)

Since, the project is in seismic zone II as per Seismic Zonation Map of India and designing of canal system and reservoir will be as per design code. Therefore, possible occurrence of earthquake shall not pose any danger to the civil structures as suitable seismic co-efficient has been accounted for in the design. Since no major underground construction are involved the chances of geological surprises are not much. The intensity of anticipated environmental impact on geology of the area will be weak and extent of anticipated impact will be local. No impact is anticipated on the geology of the area during the operation phase.

4.1.3 Risks Due to Seismicity and Earthquake

The project area is in seismic zone II (moderate) as per Seismic Zone Map. For the design of earthquake resistance dam/hydraulic structures, applicable relevant standards and guidelines as per IS: 1893:2002 have been considered.

4.1.4 Loss of Forest land

For Phase-I works, diversion of 205.48 ha of forest land in Achampet Division of Nagarkurnool District for works of Lift-I Pumphouse, formation of Anjanagiri Reservoir, tunnel in between Anjanagiri reservoir at Narlapurand Veerajanya Reservoir at Yedula has been affected. Thus, there shall be loss of 208.48 ha of forest land besides habitat fragmentation.

4.2 IMPACTS ON LAND ENVIRONMENT

The land use class of 205.6 ha forest land diverted for Phase-I shall change into waterbody as well as built up area. The land use class of Patta land coming under submergence in reservoir shall change into waterbody. The land use of Patta land used in construction of open canal, tunnels and approach canals shall change into waterbody as well as built up area. The land use class agriculture land (private land) and barren land (revenue) involved in canal section shall change into waterbody and built-up area. The change shall be permanent and irreversible.

4.2.1 Immigration of Labour

During the construction phase congregation of approximately 13500 workers is likely to take place in the project area, for which semi-permanent / temporary accommodation would be required. Due to labour influx, pressure on land and water resource would occur. The disposal of sewage, solid waste would be required. If the labour force is not provided with proper fuel arrangements, the pressure on adjoining forest for fuel wood may take place. To reduce the dependence on forest the project proponent / contractors shall provide alternate fuel substituting fuelwood with LPG for cooking and domestic electricity connection for lighting. Conflict between the migrants and the local population may occur for employment. To mitigate the adverse impact due to labour immigration the laborers shall be provided accommodation in labour colony equipped with safe drinking water supply and sanitation arrangement with

installation of STP. Medical facilities shall be provided to workforce by establishing a small dispensary near labour colony for which provisions has been made under the EMP. The impact due to labour immigration during construction shall be of temporary nature and shall cease to exist after the completion of the work as the labour shall be repatriated from the construction site. In the operation phase the project will have full-fledged infrastructure to meet the requirement of the reduced strength of 300 project workers Labour engaged in construction activity will also move away once the project work is completed; therefore, no additional impact is expected.

4.2.2 Quarry Operation and Muck Disposal

the total quantity of muck generated from works under all 21 packages shall be 11,09,83,510 cum of which 2,41,86,734 cum shall be used for works under same packages while 2,85,83,491 cum shall be used for works under other packages and balance 5,82,13,285 shall be disposed at designated area (1996 ha) acquired for the muck disposal purpose. The rock mass shall be separately stacked in spoil banks so that it can be transported to stone crushing units for manufacturing of crushed aggregate of various sizes/grades and into crushed sand. The excavated hard rock shall be recycled as stone for revetment works and also for pitching ono slope of embankment of reservoir.

The total quantity of muck / debris to be generated due to Phase-II of the project, shall be 1510.82 Lakh cum, out of which 254.03 lakh cum shall be consumed in banking. 1115.74 lakh cum shall be disposed as spoil banks and 141.05 lakh cum shall be recycled as aggregate after crushing and used in concrete and stone works in canal works. The total quantity of muck which is mainly ordinary earth, shall be entirely consumed on project work requiring earthwork in filling like coffer bunds for canal drainage works, part of guide bund and in filling section of canal system and rest shall be dumped in spoil banks leaving nothing to be disposed outside of project area. The excavated hard rock shall be recycled as stone aggregates and crushed sand and as stone for revetment works. Thus, muck disposal shall neither be problematic nor cause any impact on the environment.

To meet the demand of 72.1 lakh cum of coarse aggregate, 26.30lakh cum fine aggregate, 87.56 lakhs cum of boulder/pitching stone,115.04 lakhs cum of filter material and 120.45 lakh cum of COT filling material besides embankment and hearting quantity under Phase-II, the project proponent shall get sufficient earth and rock mass from excavation for production of these materials through crushing.

To meet the demand of 138 lakh cum of coarse aggregate, 80 lakhs cum of boulder/pitching stone and 10 lakhs cum of filter material under Phase-II, the project proponent shall get sufficient rock mass from excavation of canals for production of these materials through crushing. The requirement of sand shall be met from fine crushing of aggregate material. The mitigation measures have been suggested under the borrow area plan and muck management plan under EMP.

4.2.3 Change In Land Quality Including Waste Disposal

Due to excavation activities in the main canal and distribution system there shall be disturbance

to the land profile which triggers land erosion. The soil erosion due to transport of detached material through drainage network generally gives rise to a series of problems, notably depletion of flow capacity, steady loss of storage capacity. The lack of proper vegetal cover is a factor to cause degradation and thereby results in severe run off/soil erosion. For reducing the soil erosion in the command area, Command Area Development Plan has been conceived. The project activities shall not create any waste per se. The solid waste shall generate from project and labour colony which shall be disposed in designated landfill after segregation. The sewage waste shall be disposed after treatment through STP.

Other source of waste during construction will be construction waste primarily including waste (arising out of the batching & mixing plant), slurry and washings from bins of coarse and fine aggregates etc. If not properly managed, construction waste can reduce land fertility of the project area. Increased dust also deteriorates the land fertility if proper mitigation measures are not taken. The leakage of POL and washings of workshop floors bring oil and grease with it. It shall be collected in oil separators before disposal on land. The soil contamination with oil shall be totally avoided.

4.3 IMPACTS ON WATER ENVIRONMENT

4.3.1 Change In Surface and Ground Water Quality

4.3.1.1 Construction Phase

Water requirement during construction stage will be met from groundwater resource. Since no water abstraction structure has been proposed from surface water source for meeting construction water requirement, there shall be no occasion for contamination on this count. Nonetheless, the silt laden water emanating from all other open-air works and from the foundation works of canal structure would bring considerable sediments in water. The discharge coming out of batching and crushing plants would also bring considerable sediments in water due to washing of plants and aggregate material. The leakage of POL and washings of workshop floors and washing of vehicle and equipment bring oil and grease with it and shall increase the concentration of oil and grease in water, if discharged into the river section. The impact shall be felt during construction with the slight increase in turbidity in the river/ water bodies despite resorting to de-siltation of silt laden discharge coming from various excavation points, but the transparency of the water shall not be impaired to the extent that the available sunlight ceases to power the photosynthetic reactions.

Apart from ground water recharge from the application of water in command area, the quality of ground water will also improve in the entire area as the quality of surface water to be applied conforms to class “C” water as per IS:2296-1982.

4.3.1.2 Operation Phase

In operation phase due to running of canals and application of water in fields in such area where water table is high, waterlogging and soil salinity development can occur due to heavy losses of water due to seepage from canals, distributaries and water courses. The water logging problem is further aggravated in such area which are prone to Inadequate drainage and poor maintenance of existing drainage system and outlets - inadequate farm water management.

Since the distributaries and minors do not run around the year the incidence of growth of aquatic weeds can't be ruled out. The incidence of pollution load into canal water due to decay of biomass; from effluent from agriculture and industrial sources can impair water quality.

4.3.1.3 Mitigation Measures

- Sediment extraction before releasing the water into the nearby water body.
- Siltation tank for settling discharge from stone crushers and batching and mixing plant.
- Conjunctive use of surface and ground waters can result in reducing water logging.
- Proper surface and subsurface drainage in area prone to water logging.
- Strict and stringent steps for controlling the practice of passing agriculture and industrial effluent into canals.
- Proper maintenance and routine weed control in canal section.

4.3.2 Pisciculture Development

Under Phase-I of projects 6 reservoirs shall be constructed in which water shall be available round the year. Therefore, Fisheries management Plan for reservoirs based on the stocking–cum capture fishery technique has been proposed under EMP.

4.3.3 Change In Hydraulic Regime and Downstream Flows

The project envisions lifting of 90TMC @1.5 TMC in about 60 days during the flood season from the fore shore of the Srisailam Reservoir project on Krishna River. Therefore, the most obvious impact hydraulic impact shall be alteration of the downstream flow regime during the period the water from the reservoir shall be lifted for storing in reservoirs for drinking /industrial and irrigation purpose. The daily abstraction of water shall be about 680 cumecs during period of abstraction. The most common attribute of water abstraction shall be a decrease in the magnitude of flood peaks downstream of the dam.

In the area where new storage reservoirs shall be created and when impounded with water new surface and groundwater paths shall be created which will alter the ground water hydraulic regime due to recharge of ground water from these structures.

4.3.3.1 Ground water recharge from reservoirs

Recharge due to tanks/pond seepage is given by the equation: RT (recharge from tanks and ponds) = AWSA (average water spread area or 60% of design water spread area) X Days (number of days water is actually available in tanks and ponds) X R Factor (a recharge factor in mm/day). GEC recommends a norm of 1.4 mm/day as recharge factor. Recharge during monsoon and non-monsoon periods was computed separately.

Table 4.1 shows the results of computation of recharge due to tank/pond seepage in PRLIS Scheme after completion of the scheme. It was found that the recharge from tank/pond seepage in PRLIS Command is **0.86** TMC ft. (24.42MCM). The recharge is more (about 69% of the total) in the non-monsoon period (0.59 TMC ft), than in the monsoon (0.27 TMC ft).

Table 4.1: Recharge from Reservoir Seepage

SN	Reservoir	Water Spread m2	Water Availability Days		Recharge due to Tank Seepage (MCM)		
		60% of design	Monsoon	Non-mon	Monsoon	Non-mon	Total
1	Anjanagiri	5,985,720	90	200	0.75	1.68	2.43
2	Veeranjaneya	11,973,540	90	200	1.51	3.35	4.86
3	Venkatadri	10,578,300	90	200	1.33	2.96	4.29
4	Kurumurthiyraya	16,209,960	90	200	2.04	4.54	6.58
5	Udandapur	11,721,720	90	200	1.48	3.28	4.76
6	KP Lakshmidevipally	3,671,400	90	200	0.46	1.03	1.49
	Total			**MCM**	**7.58**	**16.84**	**24.42**
		TMC Ft.			**0.27**	**0.59**	**0.86**

4.3.3.2 Ground water recharge from Canal Seepage

Recharge due to seepage from canals, in command area is estimated (**Table4.2**) using the dimensions given in the PRLIS canal designs. Wherever the information was given in ranges, average is taken. The average canal running days will be 90 days in the monsoon and 120 days in non-monsoon to suite the irrigation requirement of the planned cropping systems, post scheme command. As all main canals are lined and in normal soils with some clay content along with sand, the GEC recommended seepage factor – 3.50 ha m/day/million sqm of wetted area and for Unlined canals in normal soils with some clay content along with sand - 17.5ha m/day/million sqm of wetted area was used in computation of recharge. The estimate seepage is around 214.42 MCM.

Table 4.2: Recharge from Canal Seepage

S.N.	Name of the Canal	Length (Km)	Wetted Area (m2)	Recharge from Canal Seepage MCM		
				Monsoon	Non-monsoon	Total
1	Venkatadri Main	152.00	30,33,881	9.56	5.10	14.65
2	Venkatadri LLC	29.60	2,52,931	0.8	0.42	1.22
3	Kurumurthyraya HLC	108.00	23,11,243	7.28	3.88	11.16
4	Kurumurthyraya LLC	36.00	4,10,427	1.29	0.69	1.98
5	Udandapur 1 R	4.60	36,317	0.11	0.06	0.18
6	Udandapur 2 R	72.00	13,42,194	4.23	2.25	6.48
7	Udandapur SMC	25.00	2,04,875	0.65	0.34	0.99
8	Udandapur LMC	137.73	30,45,772	9.59	5.12	14.71
9	Udandapur Maddur	113.20	21,17,821	6.67	3.56	10.23
10	Udandapr Hanwada	22.74	1,76,833	0.56	0.30	0.85
11	KP Lakshmi NMC	89.00	14,92,088	4.7	2.51	7.21
12	KP Lakshmi EMC	106.00	21,32,473	6.72	3.58	10.30
13	KP Lakshmi SMC	19.60	2,24,385	0.71	0.38	1.08
14	Distributory	1320.00	38,30,858	60.34	32.18	92.52
15	Minor	1,300.00	16,91,408	26.64	14.21	40.85
Total			**MCM**	**139.84**	**74.58**	**214.42**
			TMC ft	**4.94**	**2.63**	**7.57**
Percentage				65.22	34.78	100%

4.3.3.3 Ground water recharge from field application

Table 4.3 shows the summary of the estimated future groundwater recharge from return flow from irrigation. It is estimated that the groundwater recharge due to return flow from irrigation in PRLIS Command 416.54 MCM (14.71TMC ft).

Table 4.3: Recharge from Field Application

Irrigated area under Rice (monsoon)	-	ha.		
Irrigated area under Rice (non-monsoon)	-	ha.		
Irrigated area under non-rice (monsoon)	495,835	ha.		
Irrigated area under non-rice (non-monsoon)	77,887	ha.		
Irrigation Return Flow Factor*	**Rice**	**Non-rice**		
Water Level (mbgl) - Monsoon Av. - 9 m bgl	50.00	30.00		
Water Level (mbgl) - Non-mosoon Av. - 12 m bgl	46.70	27.30		
	Ha.m.	**MCM**	**TMC ft.**	**%**
Irrigation Water Applied (monsoon)				
For rice cultivation – NA	-	-	-	
For non-rice cultivation (0.233 m/ha.)	115,529.56	1,155.30	40.80	
Irrigation Water Applied (non-monsoon)				
For rice cultivation - NA	-	-	-	
For non-rice cultivation (0.329 m/ha.)	25,624.82	256.25	9.05	
Recharge due to irrigation (monsoon)	**34,658.87**	**346.59**	**12.24**	83.21
From rice cultivation	-	-	-	
From non-rice cultivation	34,658.87	346.59	12.24	
Recharge due to irrigation (non-monsoon)	**6,995.58**	**69.96**	**2.47**	16.79
From rice cultivation	-	-	-	
From non-rice cultivation	6,995.58	69.96	2.47	
RETURN FLOW FROM IRRIGATION - SURFACE WATER	**41,654.44**	**416.54**	**14.71**	
Irrigation water applied is taken as per irrigation water requirements worked out.				
Irrigation Return Flow Factor and estimation as per GEC Guidelines 2015				

4.3.3.4 Total Recharge and Net Groundwater Availability after scheme completion in PRLIS Area

Computation of Net annual groundwater availability after scheme completion is done considering both the command and non-command areas of the PRLIS in future. The final numbers were arrived at after deducting the unaccounted natural discharges from the total recharge (rainfall and secondary, both in command and non-command areas). The total recharge due to project shall be 1291.02 MCM, which has been summed up in **Table 4.4.** Accounting for unavoidable natural discharge (10%), the net ground water recharge shall be 1161.92 MCM.

Table 4.4: Total Recharge from PRLIS Reservoirs, Canal System /Field Application

Form of Groundwater Recharge	Recharge (MCM)			Recharge (TMC ft.)		
	Mon	Non-mon	Total	Mon	Non-mon	Total
Command Area						
Recharge from Rainfall	254.00	75.23	329.22	8.97	2.66	11.63
From canal seepage	139.84	74.58	214.42	4.94	2.63	7.57
From seepage of tanks and ponds	7.58	16.84	24.42	0.27	0.59	0.86
From return flow of Irrigation –	346.59	69.96	416.54	12.24	2.47	14.71

SW						
Total Future Recharge – Command	**748.00**	**236.60**	**984.60**	**26.42**	**8.36**	**34.77**
Non-Command Area						
Recharge from Rainfall	149.51	49.46	198.97	5.28	1.75	7.03
From return flow of Irrigation – GW	70.63	36.82	107.45	2.49	1.30	3.79
Total Future Recharge -Non-command	**220.13**	**86.28**	**306.42**	**7.77**	**3.05**	**10.82**
Total Future Recharge –Total	**968.13**	**322.88**	**1291.02**	**34.19**	**11.40**	**45.59**
Unavoidable natural discharges (10%)	96.81	32.29	129.10	3.42	1.14	4.56
Net groundwater availability – Future	**871.32**	**290.60**	**1,161.92**	**30.77**	**10.26**	**41.03**

4.3.4 Water Pollution Due to Disposal of Sewage

The untreated sewage and other solid waste increases, if discharged to the waterbody increases its BOD loading and render water un-potable without conventional treatment and disinfection. The staff quarters during construction shall be developed for staff for housing 300 populations The domestic water requirement for the project staff shall be of the order of 30m^3/day @ 100 lpcd. Assuming that about 80% of the water supplied will be generated as sewage, i.e.,24 m^3/day. The BOD load contributed by domestic sources will be about 238mg / litre, assuming per capita BOD contribution as 19 g/day. There is no flow in the rivers near to the colony areas except monsoon period which implies that there is no discharge in the river for dilution of BOD load from sewage from labour colony.

Thus, the disposal of untreated sewage can lead to water pollution, resulting in increase in coliforms and other various pathogens, which can lead to incidence of water borne diseases. For avoiding this situation provision of STP has been made in the EMP. The sewage waste shall be disposed after treatment through STP. The effluent to be discharged should conform to the Standard adopted vide GSR1265(E), dated 13.10. 2017 (**Table 4.5**). It must be ensured the limits in respect of parameters are not exceeded

Table 4.5: Effluent Discharge Standard

S.N.	Effluent discharge parameter	Concentration
1	pH	6.5-9.0
2	Bio- Chemical Oxygen Demand (BOD)	<30 mg/litre
3	Total Suspended Solids (TSS)	<100 mg/litre
4	Fecal Coliform (FC) (Most Probable Number per 100 milliliter, MPN/100ml	<1000

4.3.5 Water Pollution from Labour Colonies/Camps and Washing Equipment

The labour colonies shall be located at appropriate place in the project area. For ease and facilitating works it is proposed to house the labour in camps, and for complete project it is anticipated that 45 camps shall be established.

The total domestic water requirement for the construction worker and the technical staff is of the order of 1181 m^3/day. Assuming that about 80% of the water supplied will be generated as sewage, i.e., 945 m^3/day. The BOD load contributed by domestic sources will be about 238mg / litre, assuming per capita BOD contribution as 19 g/day.

Thus, the disposal of untreated sewage can lead to water pollution, resulting in increase in coliforms and other various pathogens, which can lead to incidence of water borne diseases. Therefore, project authorities would be taking appropriate measures to check such disposal into the river. To avoid any deterioration in water quality due to disposal of untreated sewage from labour camps, appropriate sewage treatment facilities will be commissioned in the labour camps. The sewage waste shall be disposed after treatment through STP. The effluent to be discharged should conform to the laid down Standard (**Table 4.5**)

The leakage of POL and washings of workshop floors and washing of vehicle and equipment bring oil and grease with it and shall increase the concentration of oil and grease in water, if discharged into the river section. Therefore, it shall be collected in oil separators provided in the concrete drains before disposal on water body/ land. The water and soil contamination with oil and grease shall be totally avoided. Even during construction period vigil should be taken by not allowing washing of any vehicle in the river section in the reservoir reach up-stream of the dam axis. The workshop shall be planned away from the river.

4.4 IMPACTS ON AIR ENVIRONENT

4.4.1 Change In Ambient Air and GLC

The air pollution impact of excavation in ordinary earth and boulders and rock is directly dependent upon construction methodology, annual rate of excavation, mode of transport within the construction site, mode of screening and method of crushing. The air pollution sources at the proposed dam site can be broadly classified into three categories, viz. area source, line source and instantaneous point source.

Extraction of stone by various activities includes excavation pit(s) and activities happening in the excavation area like drilling, blasting, hauling and loading/unloading. The dust emission from these areas will be fugitive in nature. The excavator operations, loading/unloading operations will also cause dust emission though it will be confined to the area of operation of the machinery. The gaseous emission from their operation shall be minimal and limited within the excavation area.

Transportation of excavated material from the excavation site to either spoil banks (dumping sites) or the stone crusher unit are categorized as line source. Since the dumper movement on haul road will be within the canal construction area, no adverse impact shall be felt in the settlement area.

Blasting is the major source of instantaneous emission sources of particulate matter and NOx. The large quantity of dust will be wind borne. With the proposed control measures, the fugitive emissions will be minimized in terms of their impact on environment

4.4.2 Dust Dispersion Modelling for Excavation Operation

In In order to predict the particulate emissions, Lakes Environmental Aermod View version 9.8.1 (Air Dispersion Modelling Software) an interface based on ISCST3 - was used to predict changes in air quality i.e., maximum ground level concentration (GLC's) of Particulate Matter. Short term model options were opted for uniform emissions rates. The air modelling was conducted to predict GLC of fugitive dust emission particulate matter i.e. PM_{10} and $PM_{2.5}$ and gaseous pollutants SO_2 and NOx ,which are released due to detonation of explosives during blasting operations.

In the present study, the emission rates suggested by the United States Environmental Protection Agency (USEPA–42-Fifth Edition, Chapter-13- Miscellaneous Sources, Section 13.2.3 for Heavy Construction Operation and 13.3 for Explosive Detonation) have been used. For emission factors due to detonation of explosives Table 13.3-1 was followed. For largely used explosive ANFO with5.8-8% Fuel oil, the emission rates for NOx and SO_2 has been adopted as 8 kg/ton and 1 kg/ton. Emission factor of 2.69ton /hectare/month of activity has been adopted for TSP and values for PM_{10} and $PM_{2.5}$ have been worked out using relation PM_{10}= 0.34 TSP and $PM_{2.5}$ =0.03 TSP.

The maximum construction activities shall take place at the head reach of main canals as at that point canals excavation and construction of head regulator shall also be involved. Therefore, air modelling has been carried at the head reaches of Venkatadri Main Canal taking off from Venkatadri reservoir, High level canal taking off from Kurumurtharya reservoir, Left Main Canal taking off from Udandapur reservoir and North Main Canal taking off from KP Lakshmidevi Pally reservoir. Isopleths for 24-hourly GLC developed for all pollutants are shown in **Figure 4.1** through **Figure 4.4**. The anticipated values of GLC at head reach of various main canal and nearby settlements for various pollutants are shown in **Table 4.6.**

The maximum predicted GLC for pollutant PM_{10} due to excavation activities at the head reaches of Venkatadri Main Canal taking off from Venkatadri reservoir, High level canal taking off from reservoir. Left Main Canal taking off from Udandapur reservoir and North Main Canal taking off from KP Lakshmidevi Pally reservoir was found to be 10.74µg/m^3, 8.57µg/m^3,8.02µg/m^3 and 9.24µg/m^3respectively.

The maximum predicted GLC for pollutant $PM_{2.5}$ due to excavation activities at the head reaches of Venkatadri Main Canal taking off from Venkatadri reservoir, High level canal taking off from reservoir. Left Main Canal taking off from Udandapur reservoir and North Main Canal taking off from KP Lakshmidevi Pally reservoir was found to be 1.13µg/m^3, 0.96µg/m^3,1.34µg/m^3 and 1.39µg/m^3respectively.

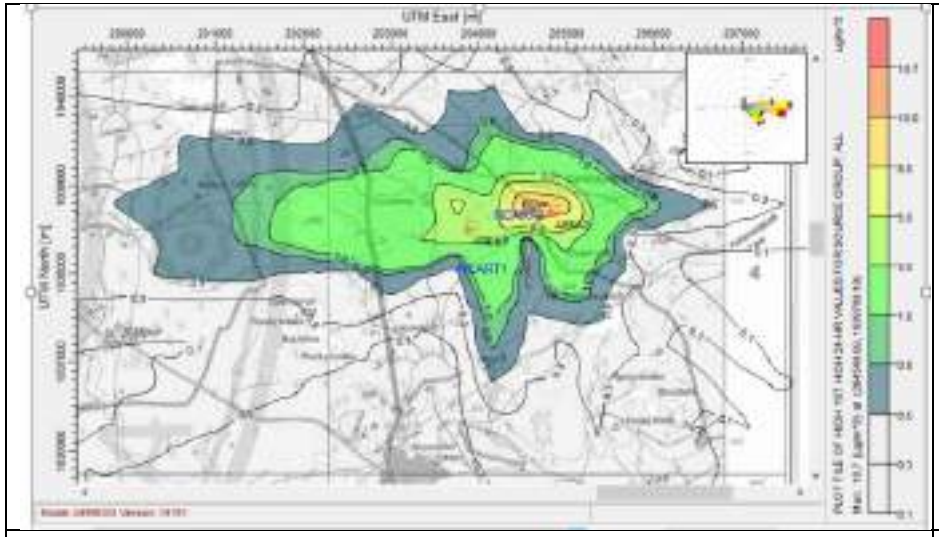
The maximum predicted GLC for pollutant NOx due to excavation activities at the head reaches of Venkatadri Main Canal taking off from Venkatadri reservoir, High level canal taking off from reservoir. Left Main Canal taking off from Udandapur reservoir and North Main Canal taking off from KP Lakshmidevi Pally reservoir was found to be 3.92 µg/m^3, 5.36µg/m^3,5.35µg/m^3 and 5.78µg/m^3respectively.

The maximum predicted GLC for pollutant SO_2 due to excavation activities at the head reaches of Venkatadri Main Canal taking off from Venkatadri reservoir, High level canal taking off from reservoir. Left Main Canal taking off from Udandapur reservoir and North Main Canal taking off

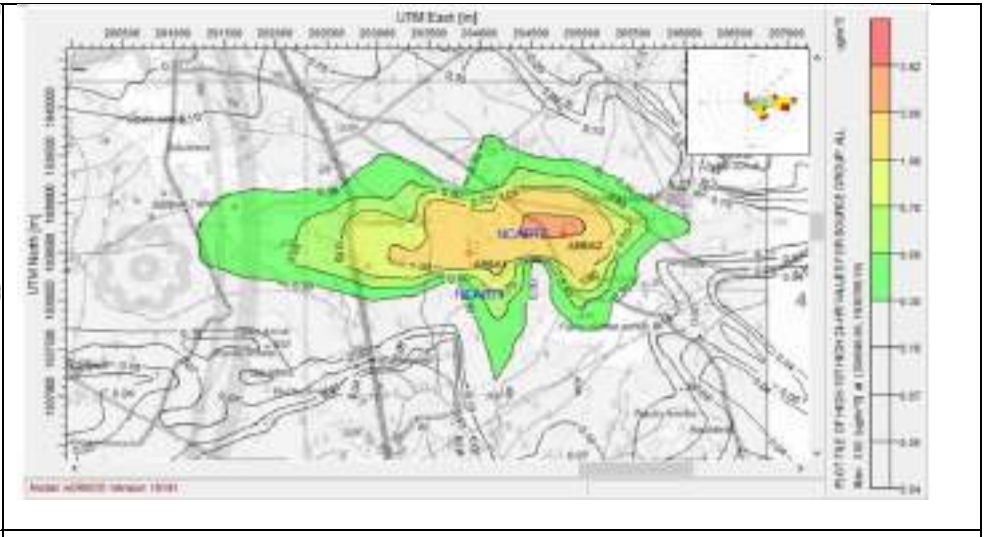
from KP Lakshmidevi Pally reservoir was found to be 3.50 µg/m^3, 0.86µg/m^3,1.07µg/m^3 and 0.81µg/m^3respectively.

Table 4.6: Maximum Concentration at Receptors

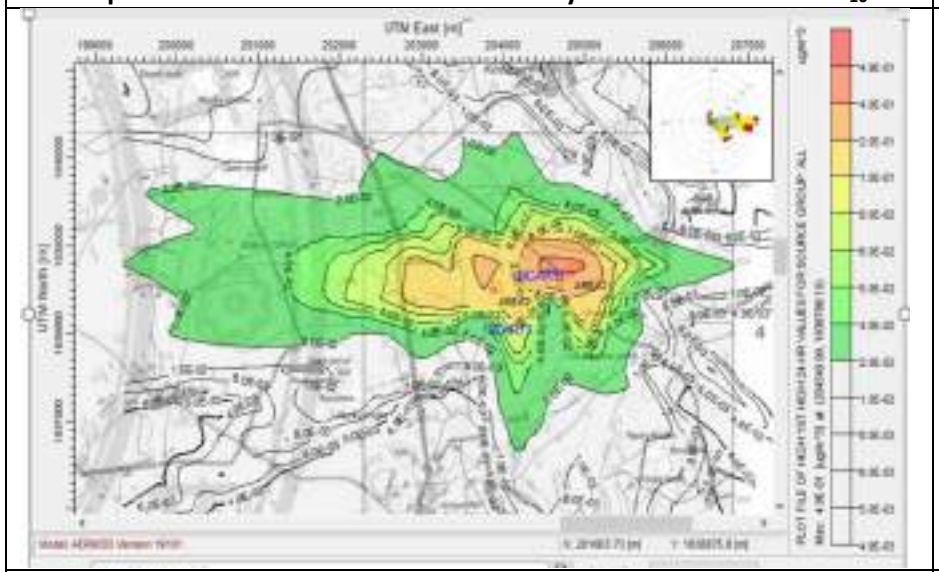
Location	24 -hourly Maximum GLC (µg/m^3)			
	PM_{10}	$PM_{2.5}$	NOx	SO_2
Venkatadri Main Canal taking off from Venkatadri Reservoir				
Head VMC	10.74	1.13	3.92	0.50
Yankayapalli	0.57	0.05	0.21	0.03
Yankayapalli	3.50	0.37	1.28	0.16
High level canal taking off from Kurumurtharya Reservoir				
Head HLC	8.57	0.96	5.36	0.86
Tadparli	0.58	0.06	0.36	0.05
Kottur	0.37	0.04	0.24	0.04
Left Main Canal taking off Udanadapur Reservoir				
Head LMC	8.02	1.34	5.35	1.07
Banda Elkacharla	1.43	0.24	0.95	0.19
Kamanpalle	0.19	0.03	0.13	0.03
North Main Canal taking off from KP Lakshmidevi Palley Reservoir				
Head NMC	9.24	1.39	5.78	0.81
Rawalpalle	1.06	0.16	0.66	0.09
Syadpalle	0.95	0.14	0.59	0.08



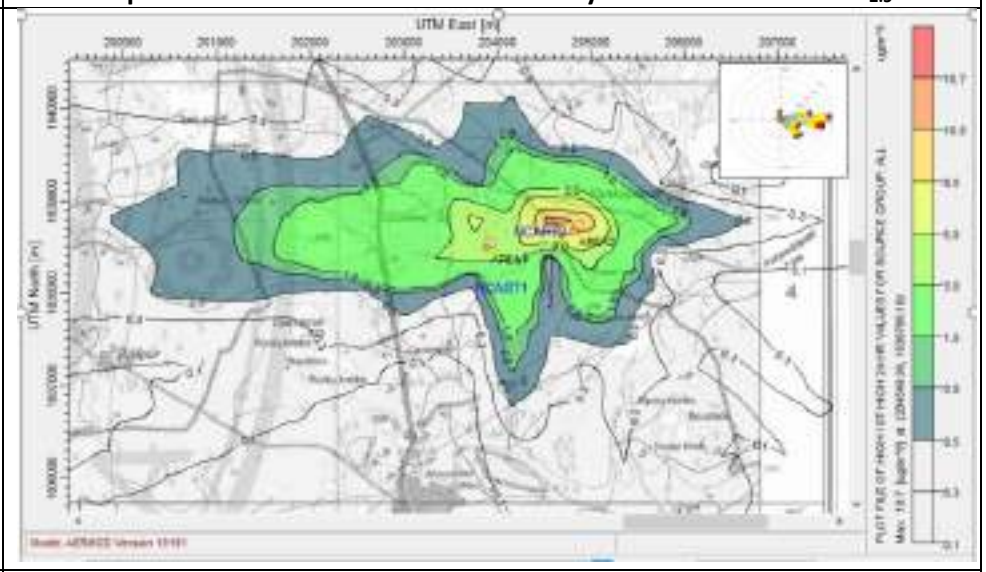
Isopleth of Maximum Predicted 24 hourly Concentration for PM_{10}



Isopleth of Maximum Predicted 24 hourly Concentration for $PM_{2.5}$

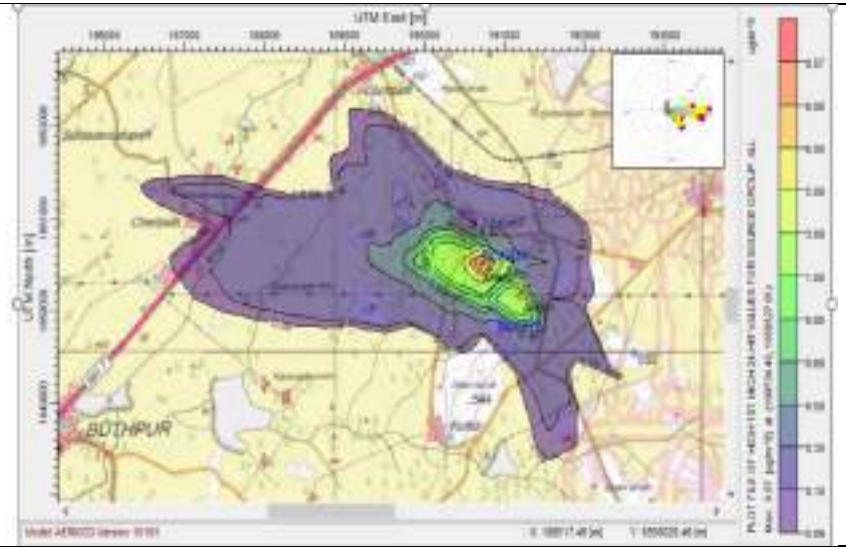


Isopleth of Maximum Predicted 24 hourly Concentration for NOx

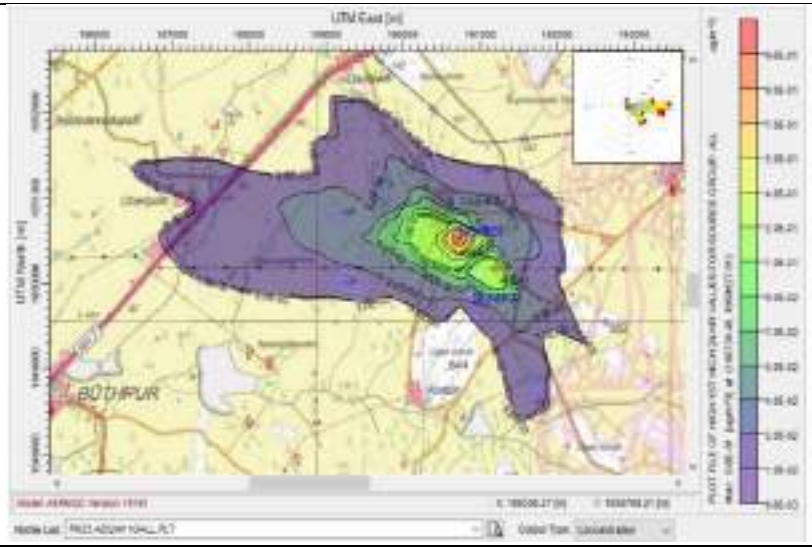


Isopleth of Maximum Predicted 24 hourly Concentration for SO_2

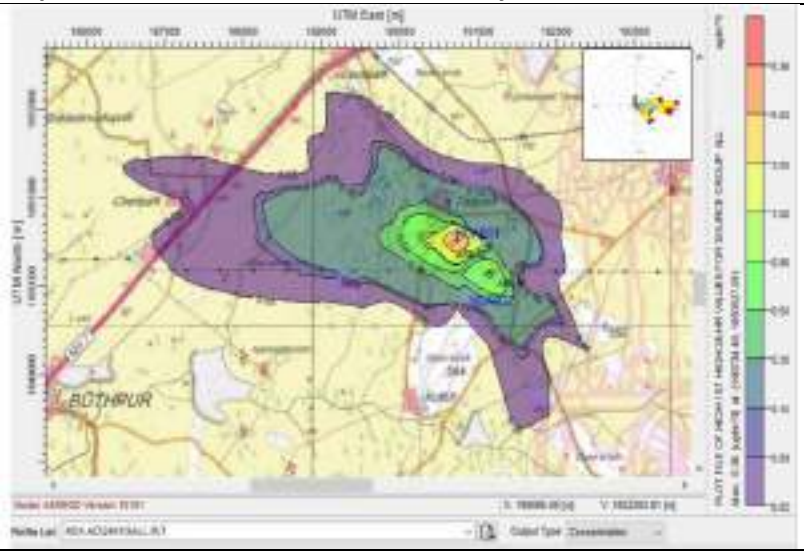
Figure 4.1: Isopleth of Maximum Predicted 24-hourly GLC for Pollutants (VMC)



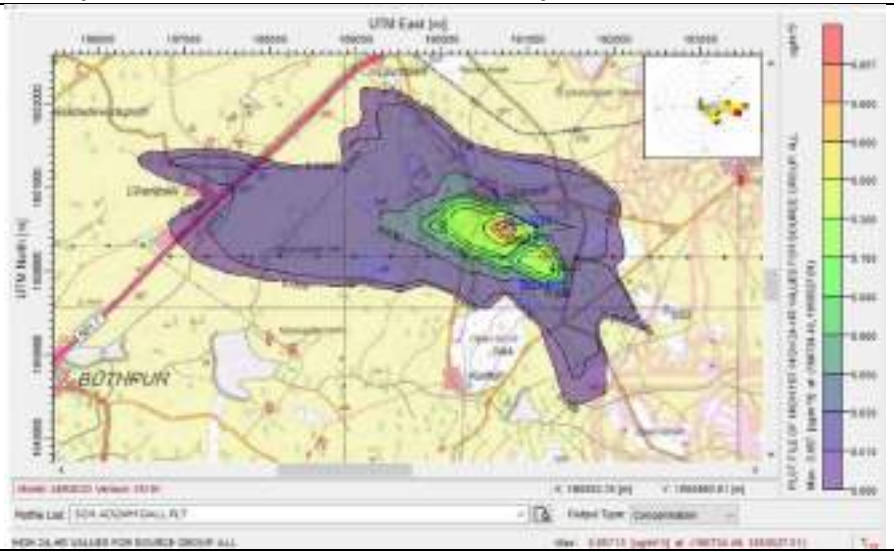
Isopleth of Maximum Predicted 24 hourly Concentration for PM_{10}



Isopleth of Maximum Predicted 24 hourly Concentration for $PM_{2.5}$

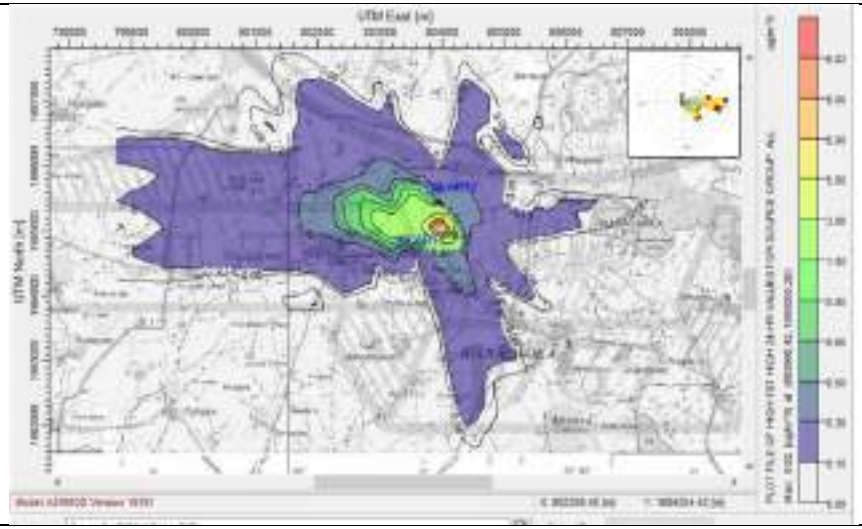


Isopleth of Maximum Predicted 24 hourly Concentration for NOx

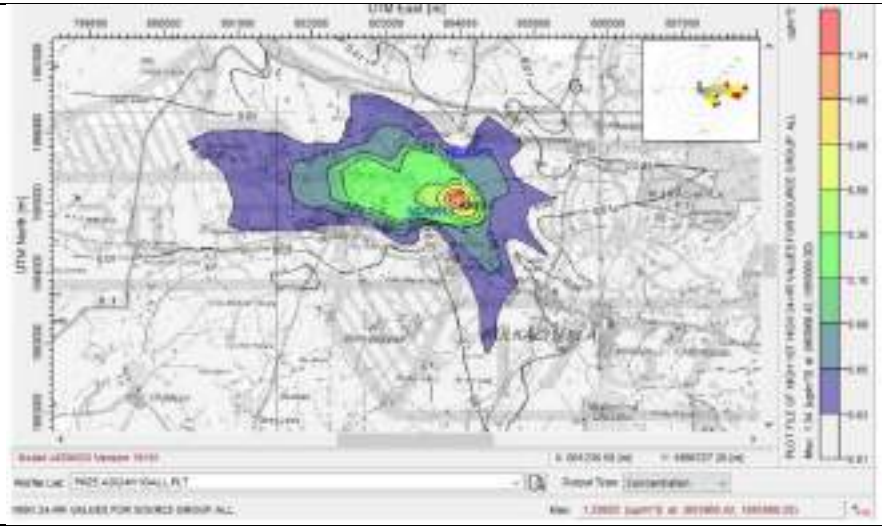


Isopleth of Maximum Predicted 24 hourly Concentration for SO_2

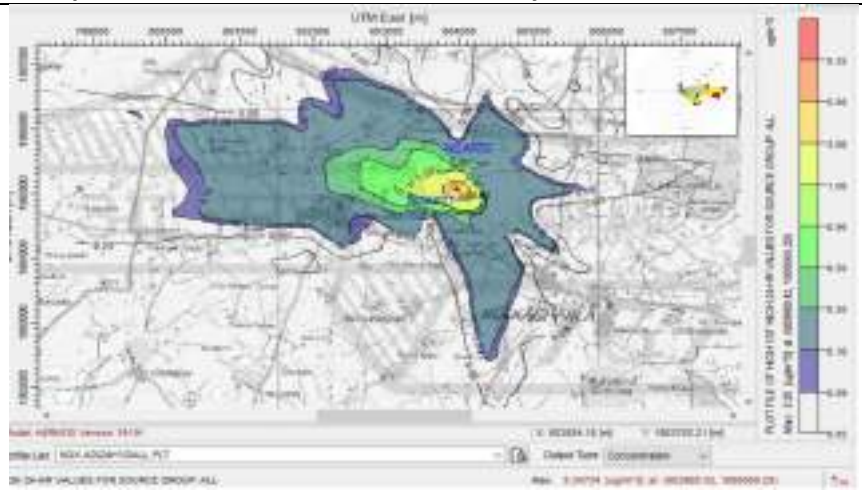
Figure 4.2: Isopleth of Maximum Predicted 24-hourly GLC for Pollutants (HLC)



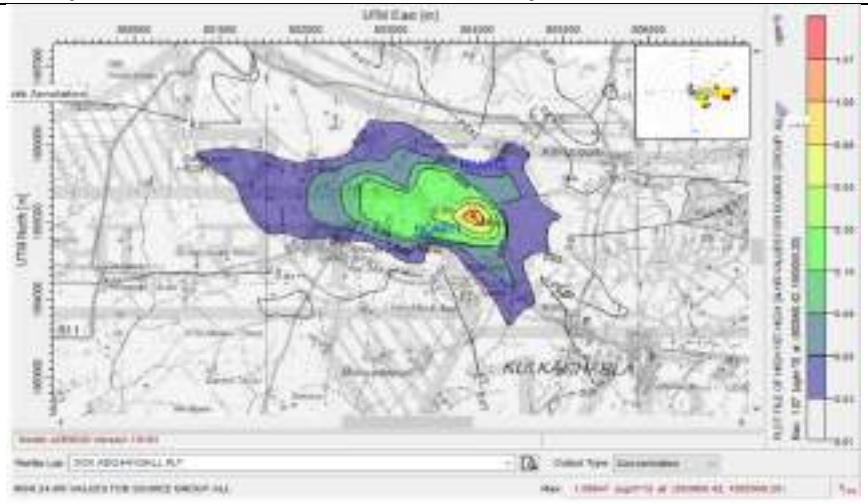
Isopleth of Maximum Predicted 24 hourly Concentration for PM_{10}



Isopleth of Maximum Predicted 24 hourly Concentration for $PM_{2.5}$

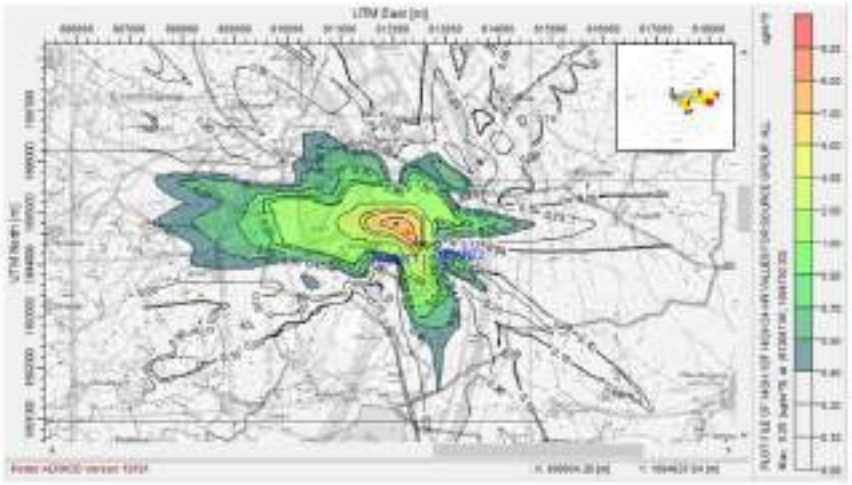


Isopleth of Maximum Predicted 24 hourly Concentration for NOx

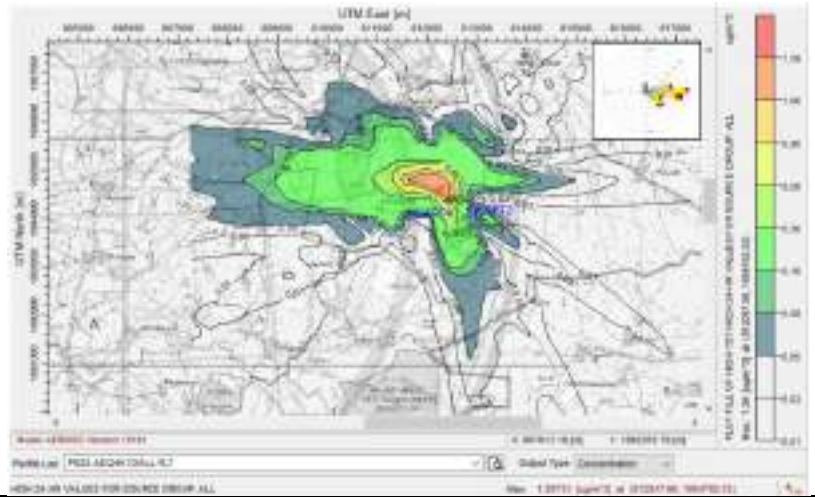


Isopleth of Maximum Predicted 24 hourly Concentration for SO_2

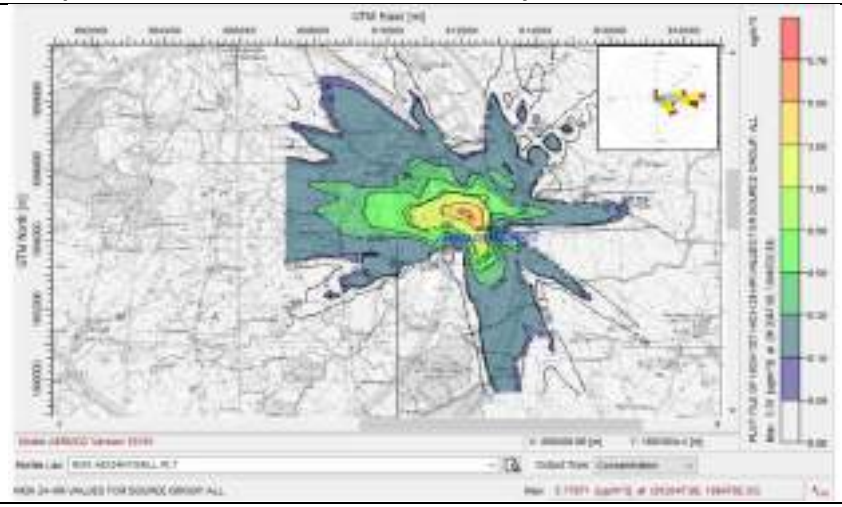
Figure 4.3: Isopleth of Maximum Predicted 24-hourly GLC for Pollutants (LMC)



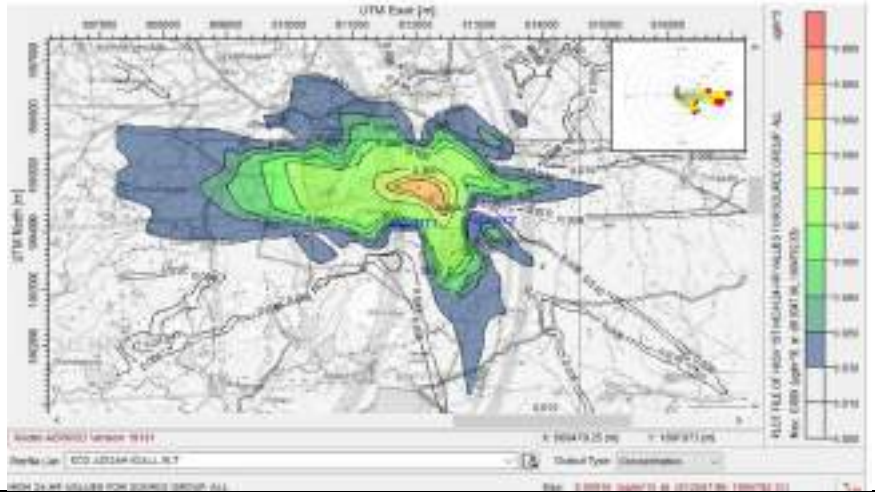
Isopleth of Maximum Predicted 24 hourly Concentration for PM_{10}



Isopleth of Maximum Predicted 24 hourly Concentration for $PM_{2.5}$



Isopleth of Maximum Predicted 24 hourly Concentration for NOx



Isopleth of Maximum Predicted 24 hourly Concentration for SO_2

Figure 4.4: Isopleth of Maximum Predicted 24-hourly GLC for Pollutants (NMC)

4.4.2.1 Resultant Impact

The resultant impact due to construction activities at head of main canals on the Ambient air quality for air pollutants (PM_{10}, $PM_{2.5}$, NOx and SO_2) at the head reach of main canals is presented in **Table 4.7** which shows that, the resultant concentration level at each of the locations are within the NAAQS. The maximum resultant concentration for PM_{10}, $PM_{2.5}$, NOx and SO_2 are 60.04 µg/m^3, 27.73 µg/m^3, 23.48 µg/m^3 and 7.97 µg/m^{3}respectively.

Table 4.7: Predicted Resultant Levels for Air Pollutants Due to Construction((µg/m^3)

Location	Pollutants	Max. Conc.	Predicted GLC (PM_{10})	Resultant concentration	NAAQS (µg/m^3)
Head VMC (Venkatadri Reservoir)	PM_{10}	49.3	10.74	60.04	100
	$PM_{2.5}$	26.6	1.13	27.73	60
	NOx	17.3	3.92	21.22	80
	SO_2	6.4	0.50	6.9	80
Head HLC (Kurumurtharya Reservoir)	PM_{10}	39.6	8.57	48.17	100
	$PM_{2.5}$	22.2	0.96	23.16	60
	NOx	16.4	5.36	21.76	80
	SO_2	6.6	0.86	7.46	80
Head LMC (Udanadapur Reservoir)	PM_{10}	42.6	8.02	50.62	100
	$PM_{2.5}$	23.9	1.34	25.24	60
	NOx	16.1	5.35	21.45	80
	SO_2	6.9	1.07	7.97	80
Head NMC (Lakshmidevi Palley Reservoir)	PM_{10}	42.1	9.24	51.34	100
	$PM_{2.5}$	20.4	1.39	21.79	60
	NOx	17.7	5.78	23.48	80
	SO_2	5.6	0.81	6.41	80

4.4.2.2 Mitigation Measures

Following mitigation measures shall be adopted during mining activities to control air pollution load below the prescribed limits:

Dust generated due to drilling, blasting, ripping, and vehicular movements will be suppressed by water spraying during and after the operations.

Water sprinkling will be done on the haul road and other roads at regular intervals.

To avoid the dust generation during the drilling operations, wet drilling method will be practiced or wet drill machine will be used.

- Dust mask will also be provided to the workers.
- Proper regular maintenance of machineries will be done.
- Speed of the vehicles will be kept within the prescribed limits.
- Trucks/ dumpers will not be over loaded.
- At the feeding points stone crusher air mist spray shall be carried out and hooded conveyer belts shall be used.

4.4.3 Effects on Soil Materials, Vegetation and Human Health

Drilling and blasting invariably results in land degradation and formation of loose soil particles which are mainly fugitive dust. These dust particles are usually blown away along the wind direction and get deposited on the canopy of surrounding vegetation and agricultural crops thereby interfering with photosynthesis and other physiological activities of the green cover. Finally, this may result in reduced ecological functions of the forest ecosystems as well as economic productivity of the agro-ecosystems. In the present case the fugitive dust emission is maximum at the site of excavation which reduces to very low concentration near the villages and has no significant impact on the soil. Due to running of vehicles and machinery deployed in excavation activities the ground level concentration of PM_{10} in nearby settlement has been found to be negligible being 3.50 µg/m^3 which shall not cause any adverse impact on soil. The GLC of PM_{10} and NO_x, resulting due to running of vehicles on kuchha road, about 500m and 1000m have been found to be negligible being 1.4µg/m^3 and 1.10µg/m^3 respectively which shall not cause any adverse impact on soil.

Nitrogen oxides also upset the chemical balance of nutrients in the water, which can cause problems with the animals and plants that are dependent upon the water, leading to reduction of the fish and shellfish population. The gaseous pollutant Oxides of Nitrogen (NOx) react in the atmosphere to form Nitrogen Dioxide (NO_2) which can have adverse effects on health, particularly among people with respiratory illness. NOx are pollutants that cause lung irritation and weaken the body's defences against respiratory infections such as pneumonia and influenza, can cause shortness of breath and chest pains and increase a person's susceptibility to asthma. Air quality modelling shows that maximum predicted concentration of NOx at the nearest habitation shall be merely 1.28 µg/m^3. The air quality modelling for haul road has revealed that the increased GLC in respect of NOx were insignificant being 0.13 µg/m3 up to 25m and 0.11 µg/m3 up to 50m and 0.10 µg/m3 up to 1km.

Sulphur dioxide can react in the atmosphere to form fine particles and poses the largest health risk to young children and asthmatics. Exposure to SO_2 can create many health problems, including sweating, papillary constriction, muscle cramps, excessive salivation, dizziness, labored breathing, nausea, vomiting, convulsions, and unconsciousness, as well as possibly being absorbed by the skin and creating severe diarrhoea. In addition, it may cause effects on the nervous system, resulting in respiratory depression. It is also quite deleterious for the environment. Air quality modelling shows that predicted concentration of SO_2 at the nearest habitation shall be merely 0.19 µg/m^3. Thus, there shall not be significant impact.

Particulates are tiny solid particles consisting of particles of soot and metals which can bind to and clog the respiratory tract. These are detrimental when found in both fine ($PM_{2.5}$) and coarse (PM_{10}) forms as it accumulates in the respiratory system, and can lead to decreased lung function, respiratory disease and even death. $PM_{2.5}$ consists of particles less than one-tenth the diameter of a human hair and poses the most serious threat to human health, particularly among those with existing respiratory disorders, as they can penetrate deep into lungs. of the pollutants emitted by off-road vehicles, particulates are of special concern because their small size makes them easily respirable and thus deliverable directly into the lungs, causing any number of the aforementioned maladies.

4.4.4 Impacts of Emissions from DG Sets Used For Power During Construction

In emergent situation resulting due to grid failure or load shedding diesel generator sets shall be deployed for captive power generation. Emissions from diesel generator sets are a mixture of gases primarily comprising of Carbon Monoxide (CO), Oxides of Nitrogen (NOx), unburned Hydrocarbons (HC), and soot particles i.e., particulate matter). Their impact on human health has been brought out in sub-section 4.4.2. The gaseous emissions from DG sets will cause minor increase in gaseous pollutants at the project sites. Hence these would have some temporary impacts on the ambient air quality in the area, though these are not anticipated to have any significant impact on the people.

The emission norms in India cover CO, NOx, PM, and HC and are specified based on the number of grams of these compounds present in diesel exhaust when one kilowatt-hour of electricity is generated. These norms have been revised in December 2013 (G.S.R. 771 (E) / 11th Dec 2013 notification), its amendment vide GSR 232(E) dated 31st March, 2014 and GSR(E) dated 7th March ,2016 and have come in force from 1st July 2016. These norms are presented in **Table 4.8**.

Table 4.8: Emissions Limits for DG Sets

Power Category	Emission Limits (g/kWh)			Smoke Limit(Light absorption co-efficient per meter)
	NOx+THC or NOx+NMHC or RHC	CO	PM	
Upto 19 kW	≤ 7.5	≤3.5	≤ 0.3	≤0.7
More than 19 kW Upto 75 kW	≤4.7	≤3.5	≤0.3	≤0.7
More than 75 kW Upto 800 kW	≤4.0	≤3.5	≤0.2	≤ 0.7

NOx also contributes to smog formation, the formation of particulate matter, acid rain, can damage vegetation and contributes to ground level ozone formation. Nitrogen oxides also upset the chemical balance of nutrients in the water, which can cause problems with the animals and plants that are dependent upon the water, leading to reduction of the fish and shellfish population. When carbon monoxide meets oxygen, carbon monoxide is formed which fall in category of greenhouse gases which contribute to global climate change.

To mitigate adverse impact DG sets should be located from the consideration of prominent and first prominent wind direction so that on the downwind direction the human habitats are least impacted by the flue gas emissions. The norms prescribed by the CPCB in respect of fixing the minimum stack height for generator, should be strictly complied with. In no case, it should be lesser than the 20% of the under root of generator capacity in KVA added to the height of the building where it is installed.

4.4.5 Pollution Due to Fuel Combustion in Equipment and Vehicle

The increased traffic load in any particular segment of the road will result into direct increase in pollutants released from the vehicles. The rate of emissions of several types of vehicles is presented in**Table4.9.** However, the extent of these impacts, at any given time will depend upon the rate of vehicular emission within a given stretch of the road; and the prevailing meteorological conditions. The impacts will have strong temporal dependence as both factors

vary with time. The temporal dependence would have diurnal, seasonal as well as long-term components.

Table 4.9: Emission Factors by Vehicle Type (gm/km/vehicle)

CPCB/ ARAI (Automotive Research Association of India) - Emission Factor development for Indian Vehicles – 2008						
Type of vehicle	Make considered	Emission norms	Emission Factors (g/km)			
			CO	NO2	PM10	SO2*
Trucks (HCV Diesel driven)	Post 2000	BS-II	6.00	9.30	1.24	0.03
Passenger Cars (Diesel driven)	Post 2005	BS-II	0.06	0.28	0.015	0.004
Buses (HCV Diesel driven)	Post 2005	BS-II	3.92	6.53	0.30	0.026

** Note: Emission Factor of SO2 is calculated based on Sulphur content calculations considering Bharat Stage IV fuel norms*

California Line Source Dispersion Model (Caline 4 ver.2.1) was used to assess the emission load for PM10 and NOx due to increased transportation. During construction phase 300 tipper trucks (20 tonne) shall be deployed on the road for carriage of muck &, construction material (cement and steel), and crushed stone aggregate/sand. The model was run for one hour considering worst case angle. The receptors' location and model results for worst case wind angle are shown in **Table 4.10**. The results show that at 25 m predicted concentration is 12.4 µg/m^3, which reduces to 7.7 µg/m^3, 4.7 µg/m^3 and 1.4 µg/m^3 at 50m, 150m and 500m respectively. Thus, the impact on the pollutant level (PM_{10}) due to increased traffic due to transportation of mineral shall be minimal. The increased GLC in respect of NOx were insignificant being 0.13 µg/m^3 up to 25m and 0.11 µg/m^3 up to 50m and 0.10 µg/m^3 up to 1km.

Table 4.10: Receptor Locations and Model Results (Worst Case Wind Angle)

Distance from the Road (m)	Incremental GLC PM$_{10}$(ug/cum)	Incremental GLC NOx (µg/m^3)
25	12.4	0.13
50	7.7	0.11
100	4.7	0.10
150	3.4	0.10
200	2.8	0.10
300	2.0	0.10
400	1.6	0.10
500	1.4	0.10
750	1.2	0.10
1000	1.1	0.10

Following control measures have been suggested to prevent air pollution due to the transportation activities:

- Transport trucks/tippers shall be properly maintained.
- Only PUC certificate issued vehicles shall be used.
- Avoiding of overloading of trucks beyond stipulated capacity by installing weighbridges at the check posts or near to it.

- Strict compliance of traffic rules and regulations.
- Fugitive dust would be further minimized by taking up tree plantations, growing grass where soil depth is limited and with least damage to the existing vegetation in and around the construction sites

Operation Phase

The ambient air quality during the operation phase at the muck disposal site is expected to improve as the fugitive dust and flue gas emission sources of air pollution shall be conspicuously absent.

4.4.6 Fugitive Emissions from Various Sources

Basically, dust sources in excavation at construction site can be categorized as primary sources that generate the dust and secondary sources, which disperse the dust and carry it from place to place called as fugitive dust.

Impacts of surface excavation with or without drilling and blasting on air quality are cause for concern mainly due to fugitive emissions of particulate matter. The major operations producing dust are drilling and blasting, pit excavation, segregation and screening of material, loading and transporting. Exhaust emissions from vehicles deployed are also likely to result in inconsequential increase in the levels of SO_2, NOx, and CO. Since the project area is spread over a vast area the emissions are also spread over a large area. There may not be any concentrated emission posing danger to human health. The impact of the vehicle movements and running of various machines has already been predicted by modelling and it was found to be negligible.

4.4.7 Impact on Micro-Climate

Major construction activities involve surface excavation and concreting works, and excavation in borrow areas and muck disposal at designated sites. These activities shall not significantly affect the ambient temperature, humidity, rainfall, wind speed and direction and other meteorological parameters during construction in so far as the work is spread over a vast area. A part of the construction activities of canals shall passes through the private plantation. This will result in deforestation/felling of trees, which may increase the ambient temperature. This may result in heat island kind of micro-climate for a short duration till proper canal bank plantations and plantations along the rim of the reservoirs are raised. Similarly, the usage of large quantities of concrete, cement and asphalt absorb the sun's energy and the heat is radiated in the ambient air. Thus, during the construction phase ambient air quality would be adversely affected to some extent in small pockets. This impact on micro-climate is of low intensity and for short duration without making any significant impact on the health of the surrounding population

Wind Speed: The wind speed in any area is dependent upon local topography and is intimately connected with the development as high and low-pressure zones. The controlling factors for the pressure changes lie much beyond the construction operation in small area which stands inconsequential as compared to the vast extent of a region in general. Thus, no adverse impact on the regional wind speed is anticipated due to the construction activities.

Rainfall: The trend of rainfall follows a regional pattern and is mainly governed by the south west monsoon and disturbances in the Arabian Sea. The construction activities, therefore, are not likely to have any adverse impacts on rainfall pattern.

Humidity: The pattern of relative humidity depends mainly on the rainfall, wind, temperature and other weather phenomenon that are regional in behaviour. The excavation activities are not likely to have any impact on the relative humidity in the surrounding. However; the humidity in the area may slightly increase due to creation of waterbody. The change in land use pattern due to canal construction will have impact on the local climate due to marginal increase in humidity in operation phase.

Temperature: There shall be felling of trees in the reservoir area in the last year of construction before filling of the reservoir which may cause a localized temperature increase which shall be moderated by the trees in the green belt around the reservoir periphery. The temperature pattern is a regional behaviour and is not likely to be affected appreciably by the construction activity.

During operation phase the reservoirs have large open surfaces that facilitate water loss by evaporation. This will increase the humidity in the air around the reservoirs affecting the microclimate. The impounding of water in the reservoirs will cool the local atmosphere. Further, the increased vegetation around the reservoir will also cool the local atmosphere. These impacts on micro-climate occur during the operational phase of the project and are long term in nature

4.5 IMPACTS DUE TO NOISE AND VIBRATION

4.5.1 Impact on Noise Level

A cumulative effect of surface excavation activities generates noise and vibration in the project area and its surrounding areas. Prolonged exposure to high noise levels over a period of years invariably causes permanent damage to the auditory nerve and/or its sensory components (Banerjee and Chakraborty, 2006; Krishna Murthy et al,). The irreversible damage, commonly referred as noise-induced hearing loss (NIHL), is the commonest occupational diseases amongst the construction workers especially at such sites which have multiple noise sources. Besides this the fauna of surrounding area is also affected by noise as the wildlife is more sensitive to noise and vibration than the human beings (Mathur, 2005).

4.5.1.1 Noise Due to Drilling

The drilling is contemplated to be carried out by Jack hammer rock drills with air compressor which entail a noise level of 88.0 dB(A) and will be a worst-case scenario. Nonetheless, the noise generated due to drilling is within the standards prescribed by Occupational Safety and Health Administration (OSHA) for 8-hour exposure i.e., 90 dB (A). It is worth mentioning here that mining shall be carried in a shift of 8 hours and the equivalents noise level exposure during the shift shall be less than the safety limit of 90 dB(A).

4.5.1.2 Noise due to Blasting

Blasting generates instantaneous and impulsive noise and is site specific dependent on many factors like the dimension of the holes, type and quantity of explosive i.e., charge/delay and

degree of stemming in the hole. At the blast site with the given diameter of holes and their pattern, the noise levels are expected to be in the range of 120-130 dB (A) and tend to decrease with increase in distance of receptor. As the blasting is envisaged over a fixed time in a day the blasting is considered to last for 2-3 minutes for one blasting operation depending on the charge. The noise levels over this time would be instantaneous and short duration thus implying that impact on noise levels from blasting are not of concern.

4.5.1.3 Noise due to crushing, Screening and Loading Plant

The average noise levels generated due to proposed crushing activities will be about 88.5 dB(A) which is within the exposure limit of 90 dB(A). The crusher within the mine shall be housed in a shed to contain noise. Screening activities shall generate average noise level of about 96.5 dB (A). Workers in the noise generating zone will be provided with earmuffs/earplugs besides dust mask.

4.5.1.4 Noise due to excavation and transportation

To predict ambient noise levels due to the mining activities from various sources at different location within the mine the noise dispersion modelling has been done on the assumption that all noise sources are acting as a single source generating approximately 90 dB(A). Noise generated due to deployment of rock breaker, excavators, loaders and dump trucks are shown in **Table 4.11**.

Table 4.11: Standard Values of Noise Levels

Sl. No.	Machinery/ Activity	Noise Produced in dB(A) at 50 ft from source*
1.	Excavator/Shovel	85
2.	Front end loader	85
3.	Dump Truck/ Tippers (at full throttle)	92
4	Near Haul Road (while dumpers are moving)	88
5	Dozer (when dozing)	102
6	Drill machine (drilling with Jack hammer)	88
7	Aggregate processing unit / Stone Crusher (outside crusher cabin)	100
8	Aggregate processing unit / Stone Crusher (inside crusher cabin)	86

Source: *U.S. Department of Transportation (Federal Highway Administration) – Construction Noise Handbook*

4.5.1.5 Model for sound wave propagation during mining

For an approximate estimation of dispersion of noise in the ambient air from the point source, a standard mathematical model for sound wave propagation is used. The noise generated by equipment decreases with increased distance from the source due to wave divergence. An additional decrease in sound pressure level with distance from the source is expected due to atmospheric effect or its interaction with objects in the transmission path.

For hemispherical sound wave propagation through homogenous loss free medium, one can estimate noise levels at various locations, due to different source using model based on first principles, as per the following equation:

LP2=LP1 – 20Log (r2 / r1) - AE …….. (1)

Where,

LP2 and L P1 are the Sound Pressure Levels (SPL) at points located at r2 and r1 from the source. AE is attenuations due to Environmental conditions (E). The combined effect of the entire source can be determined at various locations by the following equation.

LP (total) = 10Log (10 (Lpa)/10 + 10 Lpb)/10 + 10 Lpc)/10 + ……) (2)

Where Lpa, LPb, LPc are noise pressure levels at a point due to various sources.

Environment Correction (AE)

The equivalent sound pressure level can be calcuLated from the measured sound pressure level (Leq measured) averaged over the measurement surface area 'S' and from corrections K1 and K2 and is given by;

(Leq measured) = (Leq measured) – K1 – K2 (3)

where,

K1 = Factor for the background noise correction. The correction was not applied in this modeling exercise, as it was not possible to measure the background noise levels by putting off machines hence it was considered as zero.

K2 = Environmental correction

In the present study dhwani PRO Version 3.6, a noise propagation modelling software developed to undertake construction, industrial and traffic noise propagation studies. A variety of scenarios can be created quickly in dhwani PRO, allowing the user to determine the impact of changing the source, layout and adding /removing the effects of shielding due to noise mitigation devices such as barriers.

Input for the model

4.5.1.6 Base Map, Point Source and Receptors

Base maps identifying the location of the site, noise sources, receptors and other important characteristics of the surrounding area is the foremost requirement. In this study jpeg raster maps created in Google map showing the locations of the construction site where the maximum excavation is to be carried out has been captured and imported for registering the map and setting up of the scale. The point source is the location where the maximum noise generating construction equipment is to be operated. The receptors are the nearby settlements where the impact of propagation of noise is to be evaluated.

4.5.1.7 Hourly noise level

Hourly nose levels observed for 24 hours at the point source have been observed and adopted in studies. The noise levels to be generated intermittently due to running of construction equipment for different hours have also been incorporated. Besides this, the background levels at the receptors have been entered the corresponding windows.

4.5.1.8 Model outputs

After running the model, the graphical results in the form of noise level contours (**Figure 4.5** through **Figure 4.8**) have been produced which has been captured and exported. Besides this the output in the tabular form showing the estimated noise levels at different receptors owing to the impact of operation of construction machinery has been generated (**Table 4.12** through **Table 4.15**)

Table 4.12: Modelling Output

Project Title: Noise Modelling Venkatavari MC
Project Subtitle: Irrigation Project Telangana
Client: I&CAD Telangana
Scenario: Without Barrier
Source Noise Level: Default

Receptor	Zone	X meter	Y meter	Estimated Level dB(A)	+Backgound* Level dB(A)	Standards *Lday dB(A)	Standards Lnight dB(A)
R_1-Kodu	Residential area	6721.5	5935.6	39.0	49.0	55.0	45.0
R_2 Bajipu	Residential area	4684.8	3489.0	34.0	46.0	55.0	45.0
R_3-Vattem	Residential area	7158.1	3036.0	40.0	47.0	55.0	45.0

Table 4.13: Modelling Output

Project Title: Noise Modelling hlc
Project Subtitle: Irrigation Project Telangana
Client: I&CAD Telangana
Scenario: Without Barrier
Source Noise Level: Default

Receptor	Zone	X meter	Y meter	Estimated Level dB(A)	+Backgound* Level dB(A)	Standards *Lday dB(A)	Standards Lnight dB(A)
R_1-Tadpar	Residential area	6277.9	4756.6	44.0	50.0	55.0	45.0
R_2 Kottu	Residential area	8023.7	4231.6	57.0	57.0*	55.0	45.0
R_3-Allure	Residential area	6587.1	3531.6	44.0	48.0	55.0	45.0

Table 4.14: Modelling Output

Project Title: Noise Modelling LNC
Project Subtitle: Irrigation Project Telangana
Client: I&CAD Telangana
Scenario: Without Barrier
Source Noise Level: Default

Receptor	Zone	X meter	Y meter	Estimated Level dB(A)	+Backgound* Level dB(A)	Standards *Lday dB(A)	Standards Lnight dB(A)
R_1-Banday	Residential area	6793.4	4617.1	39.0	49.0	55.0	45.0
R_2 Kulkac	Residential area	8459.8	3520.6	36.0	47.0	55.0	45.0
R_3-Bomred	Residential area	6566.6	3520.6	34.0	46.0	55.0	45.0

Table 4.15: Modelling Output

Project Title: Noise Modelling KPL
Project Subtitle: Irrigation Project Telangana
Client: I&CAD Telangana
Scenario: Without Barrier
Source Noise Level: Default

Receptor	Zone	X meter	Y meter	Estimated Level dB(A)	+Backgound* Level dB(A)	Standards *Lday dB(A)	Standards Lnight dB(A)
R_1 Ravapally	Residential area	8540.0	6346.5	48.0	51.0	55.0	45.0
R_2 Jaffarpally	Residential area	7935.9	7100.4	42.0	48.0	55.0	45.0
R_3 Gudur	Residential area	8014.9	5300.4	44.0	48.0	55.0	45.0

4.5.1.9 Inference and Mitigation Measures

It is evident from the graphical results (**Figure 4.5**) that the estimated noise level at head reach of Venkatadri Main Canal shall be 70 dB(A) ,whereas at three receptors at Dhania Koduparthy Mitta, Bajipur Pedha Thanda and Vattem due to running of construction machinery, shall be 39 dB(A),34dB (A and 40dB(A) and the resultant noise levels including the background level at these receptors, shall be 49 dB(A),46 dB (A and 47dB(A) which are less than the standard values. Thus, there will be increase in noise levels ranging from 7dB(A) to 12dB (A), but yet the resultant noise levels shall be within limits during day time but at night time it will exceed the limit.

It is evident from the graphical results (**Figure 4.6**) that the estimated noise level at head reach of Kurumurthyraya High Level Canal shall be 73 dB(A), whereas at three receptors at Tadparti, Kothur and Alluredue to running of construction machinery, shall be 44 dB(A),57dB (A and 44dB(A) and the resultant noise levels including the background level at these receptors, shall be 50 dB(A),57 dB (A and 48 dB(A) respectively. which reveal a marginal increase of 6 dB(A),0 dB (A and 4dB(A) respectively. An increase of about 8 −10 dB(A) is required before the sound subjectively appears to be significantly louder. Thus, there will be marginal impact of running of construction & transport machinery for excavation operation. Thus, there will be marginal impact of running of construction & transport machinery for excavation operation.

It is evident from the graphical results (**Figure 4.7**) that the estimated noise level at head reach of Udandapur Left Main Canal shall be 63 dB (A), whereas at three receptors at Bandayelkcherla, Kulkacharla and Bomreddipalle due to running of construction machinery, shall be 39 dB(A),36 dB (A and 34 dB(A) which is less than the standard values. The estimated noise levels including the background level at these receptors, due to running of construction machinery, shall be 49 dB(A),47 dB (A and 46dB(A) which is less than the standard values. Thus, there will be marginal impact of running of construction & transport machinery for excavation operation.

It is evident from the graphical results (**Figure 4.8**) that the estimated noise level of at head reach of KPL North Main Canal shall be72 dB(A), whereas at three receptors at Ravalpalle, Jaffarpally and Gudur due to running of construction machinery, shall be 48 dB(A),42 dB (A and 44 dB(A) which is less than the standard values. The estimated noise levels including the background level at these receptors, shall be 51 dB(A),48 dB (A and 48dB(A) which reveal a marginal increase of 3dB(A),6 dB (A and 4dB(A) respectively. An increase of about 8 −10 dB(A) is

required before the sound subjectively appears to be significantly loud. Thus, there will be marginal impact of running of construction & transport machinery for excavation operation.

The following control measures will be adopted at the points near to the source of noise to keep the ambient noise levels below permissible limits 75 dB (A).

- Provision and maintenance of thick tree belts to screen noise.
- Avenue plantation within the project area to dampen the noise.
- Proper maintenance of noise generating transport vehicles.
- Regular noise level monitoring shall be carried out periodically for taking corrective action
- To check the noise, pollution noise filters may be erected around crushing and batching plants and regular maintenance of heavy earth vehicles may be adopted to reduce noise levels

To protect the workers from exposures to higher noise levels the following measures will be adopted.

- Provision of protective devices like ear muffs/ear plugs to those workers who cannot be isolated from the source of noise
- Reducing the exposure time of workers to the higher noise levels by rotation.

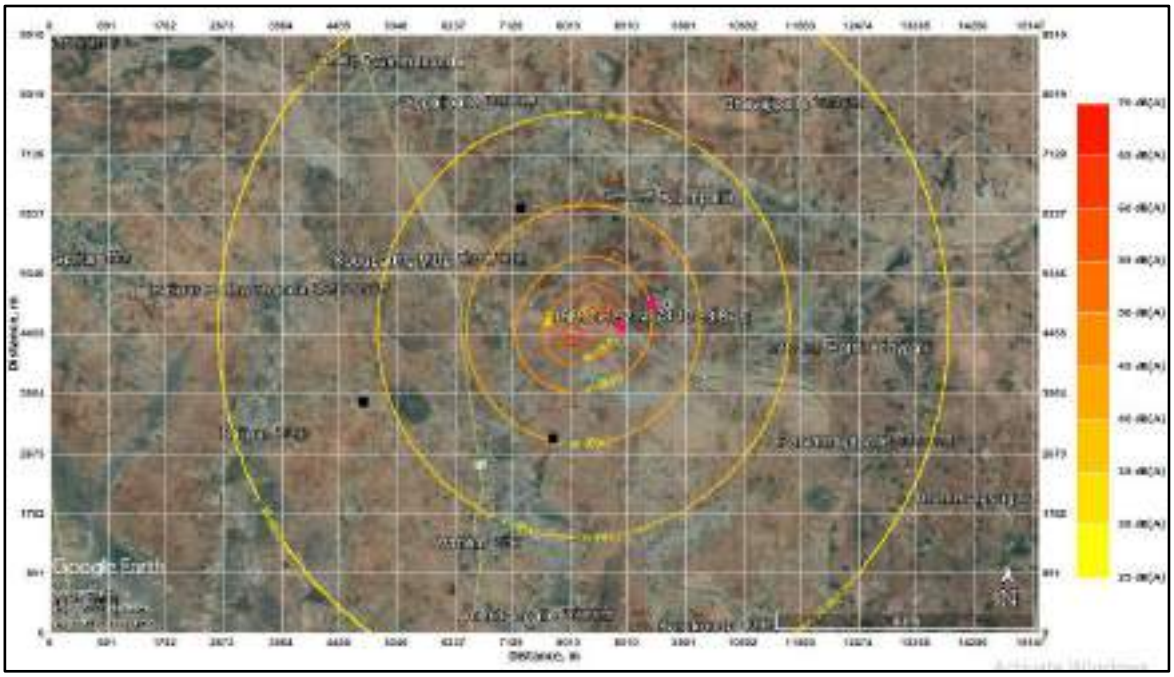


Figure 4.5: Noise Graphical Results at head reach of Venkatadri Main Canal

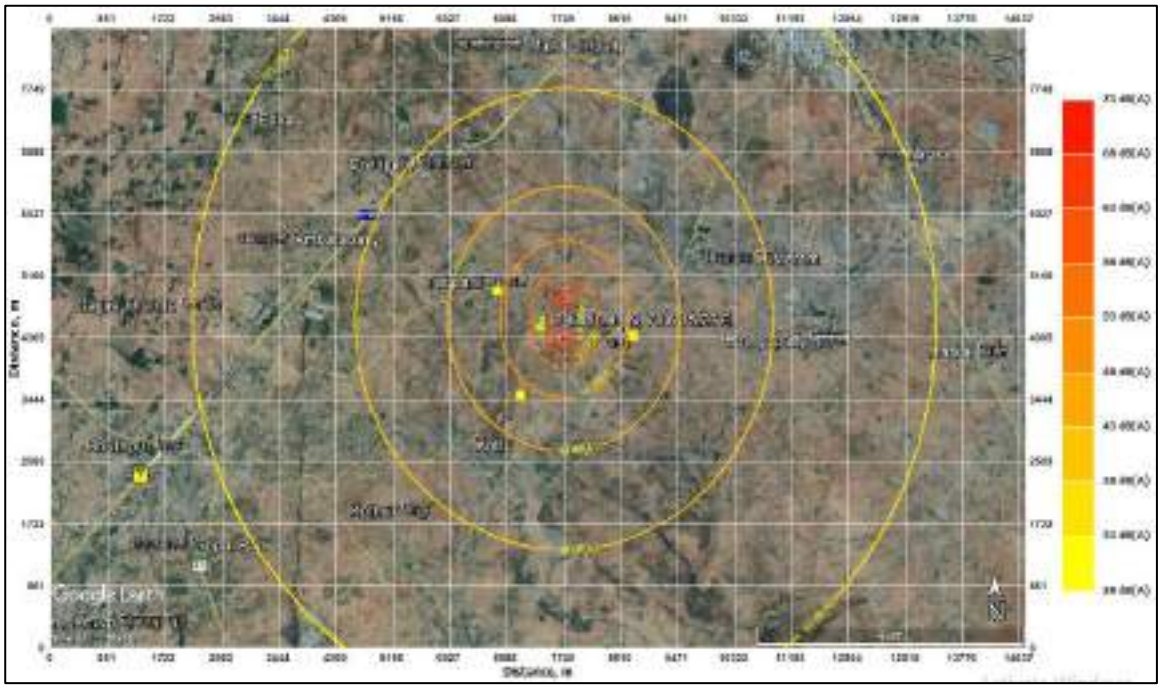


Figure 4.6: Noise Graphical Results at head reach of Kurumurthyraya High Level Canal

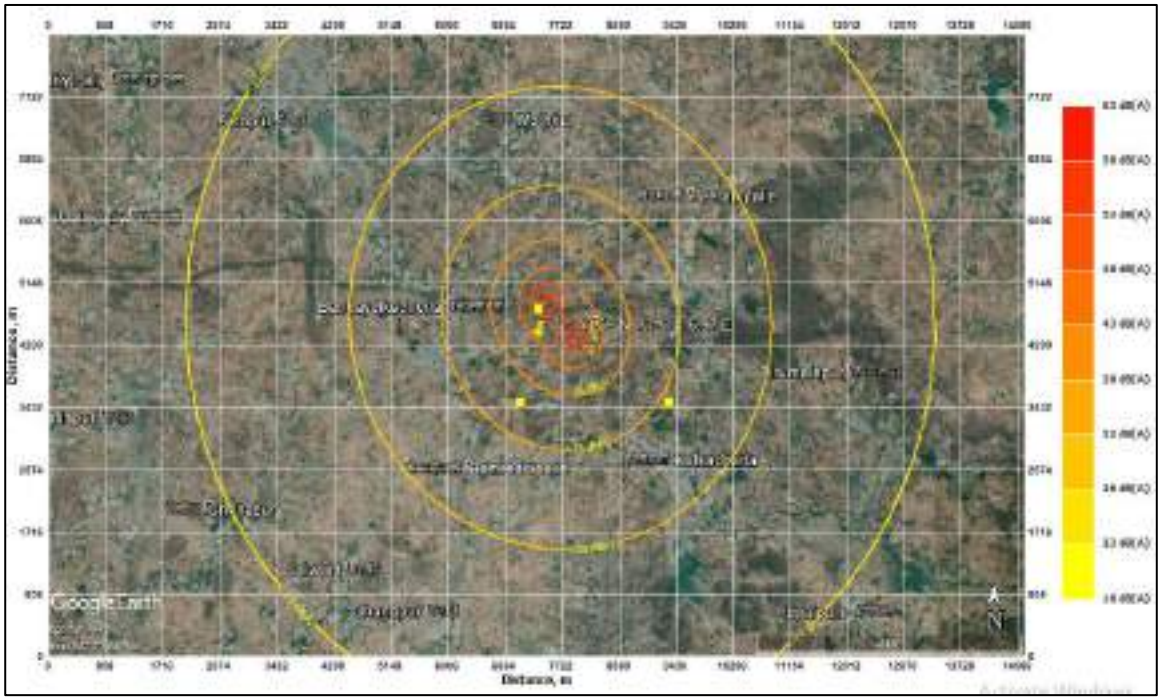


Figure 4.7: Noise Graphical Results at head reach of Udandapur Left Main Canal

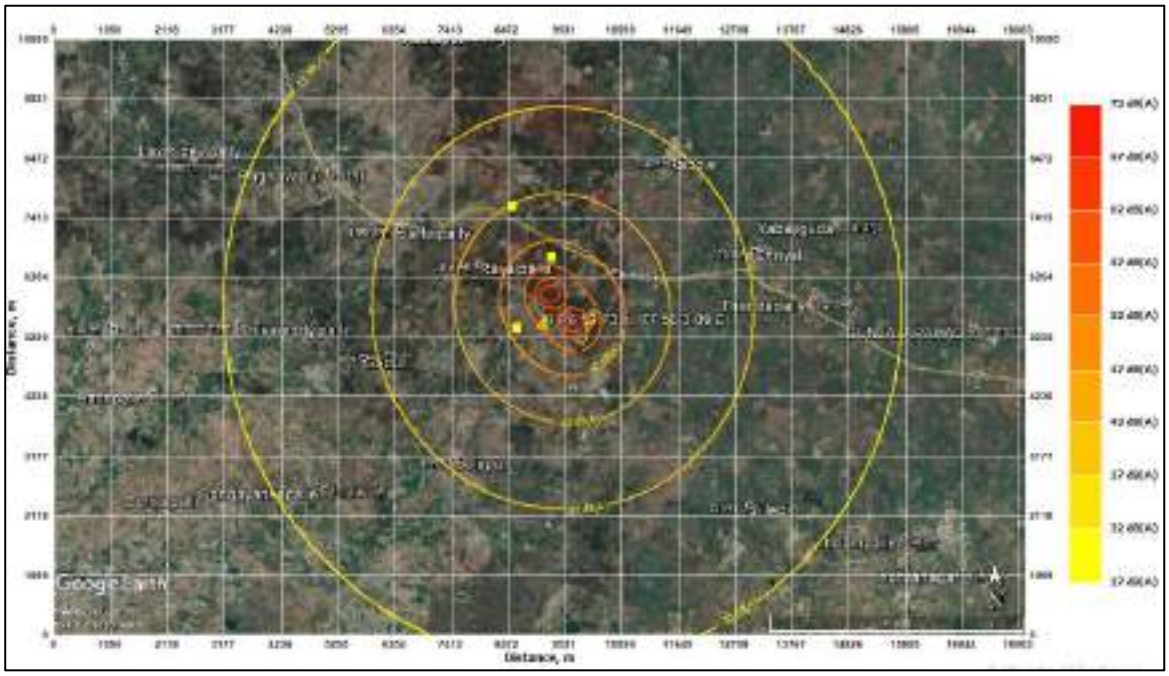


Figure 4.8: Noise Graphical Results at head reach of KPL North Main Canal

During Operation Phase

After completion of the project and during the operational phase the noise levels shall not be impacted as there are no noises emitting sources except the noise created during passing of surplus discharge through spillway, which shall persist for a few hours till the flood subsides.

4.5.2 Impacts Due to Ground Vibration (Due to Blasting)

The ground vibrations, noise and fly rock constitute the chief environmental impact of blasting. When an explosive charge detonates the chemical reaction takes place and the chemical energy is converted into shock and gas energy thereby setting prolific dynamic waves around the blast hole mainly brought by sudden acceleration of stationary rock mass. While a small portion of energy liberated during blasting is consumed in fragmentation of rock mass and fly rock apart from dissipation through ground vibration and air over pressure (noise) heat and light. The ground vibration sets the ground in transverse, longitudinal and vertical direction and which in turn causes the foundation of structure to vibrate in these directions and damage the structures.

Air overpressure is transient impulse, which traverses through the atmosphere and is both audible and inaudible and have the energy to vibrate a structure like ground vibration and is much of concern as animals are more sensitive than human being. This is mainly manifest as energy released from unconfined explosives such as uncovered detonating cord trunk. It is also caused due to various other factors like too small burden, excessive powder factor, insufficient stemming length, incorrect drilling etc., which are controllable if properly addressed by the blaster.

Ground vibrations are acoustic waves that propagate through rocks. Although the difference in accelerations, amplitude, particle velocities and the frequencies in three directions result into damage to structures but the peak particle velocity and frequency are normally taken into

consideration for evaluating the structural response. The various aspects of ground vibration triggered by open cast blasting and consequent-damaging effects on different types of structures is usually computed based on the value of the Peak Particle Velocity (PPV) induced at the foundation of the distant structure. PPV criteria are considered the best predictor for ground vibration caused by blasting. It takes into consideration the total energy of ground motion induced around a blast and is a function of the distance of the location of blast from the gauge point and quantity of explosive per blasting. In case of surface excavation at the dam site the PPV is worked out based on various empirical formulas. In the present case, the PPV has been worked out based on following empirical equation.

$V=1400 (D/\sqrt{Q})^{-1.265}$ mm/s, where,

D=Distance (m) between location of blast and gauge point

Q=Quantity (kg) of explosive per blasting

The resulting value of PPV has been compared with the limiting values for dominant excitation frequency less than 8 Hz as prescribed by the Director General of Mines Safety, India (DGMS) in Circular 7 of 1997. The study shows u located at distance mentioned against each as is evident from the following Table 4.16.

Table 4.16: Computation of Peak Particle Velocity due to Surface Blasting

Village Name	Quantity of explosives / delay (kg)	Distance (D) from Site (m)	Peak Particle Velocity in mm/s observed	Limiting value of PPV (mm/s) prescribed by DGMS, India
Venkatadri Main Canal taking off from Venkatadri reservoir				
Koduparthy Mitta	30	700	3.03	5.00
Bajipur Pedha	30	850	2.37	5.00
Vattem	30	600	3.68	5.00
High level canal taking off from Kurumurtharya reservoir				
Tadparti	25	550	3.66	5.00
Kothur	25	600	3.28	5.00
Kistaram	25	950	1.83	5.00
Low Main Canal taking off Udanadapur reservoir				
Bandayelkcherla	25	600	3.28	5.00
Kulkacharla	25	900	1.96	5.00
Bomreddipalle	25	800	2.28	5.00
North Main Canal taking off from KP Lakshmidevi Palley reservoir				
Ravalpalle	30	1050	1.81	5.00
Jaffarpally	30	850	2.37	5.00
Gudur	30	1100	1.71	5.00

To minimize vibration, the following shall be adopted:

- Blast holes shall be initiated by non-electric (NONEL down-the-hole (DTH) delay detonators.
- Care shall be taken to ensure that effective burden is not excessive and the face shall be kept sufficiently long.

- Optimum charge per delay shall be kept as low as possible.
- Adoption of two row blasting and V pattern of firing
- The firing of maximum possible no. of blast holes towards free face.
- Use of milli-second delay detonators between the holes and rows of blasting.

4.5.3 Impacts Due to Ground Vibration (Due to tunnelling)

In case of underground tunnel excavation, the PPV has been worked out based on empirical formula as recommended in IS:6922-1973. In the present case, the PPV has been worked out based on following empirical equation.

$V=K1\ (Q2/3/R)^{1.25}$ mm/s, where,

K1 = 880 for rocks

Q = charge/delay (kg)

R=Distance (m) between location of blast and gauge point

The resulting value of PPV has been compared with the limiting values for dominant excitation frequency less than 8 Hz as prescribed by the Director General of Mines Safety, India (DGMS) in Circular 7 of 1997. The study shows that the resulting PPV is considerably lower than the limiting values in case of temporary structures located at the nearest settlement from the from the blasting site located at distance mentioned against each as is evident from the following **Table 4.17.**

Table 4.17: Computation of Peak Particle Velocity due to Tunnelling

Quantity of explosives / delay (kg)	Distance (D) from Site (m)	Peak Particle Velocity in mm/s observed	Limiting value of PPV (mm/s) prescribed by DGMS, India
60	1000	4.3	5.00

4.5.4 Air Blast Over Pressure

Propagation of blast induced air over pressure has been studied by various investigators and is generally reported as cubic root rather than square root scaled distance. In context of excavation/mining operation in the cluster the overpressure is predicted by equations applicable for confined bore hole charges.

$p=3.3\ [3\sqrt{Q}/R]^{1.2}$, where,

p= pressure in Kpa

Q=Explosive charge in kg

R= is a distance from the charge

Based on the distance and charge per delay the predicted air over pressure values is shown in **Table 4.18.**

Table 4.18: Predicted Air Over Pressure

Village Name	Quantity of explosives / delay (kg)	Distance (D) from Site (m)	Predicted Air over pressure in dB(A)
Venkatadri Main Canal taking off from Venkatadri rerservoir			
Koduparthy Mitta	30	700	107.9
Bajipur Pedha	30	850	105.9
Vattem	30	600	109.5
High level canal taking off from Kurumurtharya reservoir			
Tadparti	25	550	109.8
Kothur	25	600	108.9
Kistaram	25	950	104.1
Low Main Canal taking off Udanadapur reservoir			
Bandayelkcherla	25	600	108.9
Kulkacharla	25	900	104.6
Bomreddipalle	25	800	105.9
North Main Canal taking off from KP Lakshmidevi Palley reservoir			
Ravalpalle	30	1050	103.7
Jaffarpally	30	850	105.9
Gudur	30	1100	103.2

The predicted air over pressure in dB(A) shall be lower due to attenuation and the blasting being carried out at pit level which are lower than the elevation of settlements which are higher level than the canal bed which is subject to blasting on account of rock excavation.

4.6 IMPACT ON BIOLOGICAL ENVIRONENT

4.6.1 Impacts on Flora

- Forest land and non-forest land shall be brought under submergence along with trees. This shall lead to loss of some of the plant species used for various economic purposes. For mitigating loss due to forestland Compensatory Afforestation plan and Bio diversity Management Plans have been formulated, which shall be implemented by the Forest Department.
- It is evident from this study that from the influence zone of the proposed project none of tree species, shrub, herb or any climber or grass species are either vulnerable or endangered.
- Interestingly the vegetation composition of the project zone is also widely distributed in the influence zone in abundance and there will be no significant loss to the habitat.
- The floral abundance of the project area in post construction phase will increase by many folds as the plantation under green belt, restoration and landscaping will be completed.

4.6.2 Impacts on Fauna

Construction Phase

- Increase in temporary stress levels of wildlife during construction phase due to noise, human interference and reduction in present habitat.

- Threat due to poaching might increase.
- Forest cover in the vicinity of proposed project working sites and their immediate vicinity is comprised of scrub forest where stray incidents of wildlife are reported.
- During the construction phase, various adverse impacts on the wildlife are anticipated in the surrounding areas of the proposed project in terms of increased noise levels, land vibrations during tunnelling and blasting, release of air and water pollutants, etc. Mammals are the most vulnerable group affected by these negative impacts, which affect their movement, behaviour and breeding habits.
- The accessibility to the area will improve due to construction of roads, which in turn may increase human interferences leading to marginal adverse impacts on the terrestrial ecosystem.
- Stray animals, however, may occasionally drift to the construction site. It should be ensured through stringent anti-poaching surveillance that the stray animals are not killed.

Operational Phase

- Improved habitat for mainly water birds, reptiles, mammals, amphibians and plankton due to creation of reservoirs.
- Improvement in food chain of some reptiles, birds and carnivorous mammals due to creation of reservoir and increase in humidity level.
- The butterfly diversity in the area would be enhanced, as scrub habitat around the submergence will receive substantial amount of moisture, which will help in natural regeneration of forest canopy.

4.7 IMPACTS ON SOCIO-ECONOMIC ASPECTS

4.7.1 Impacts on Local Community Including Demographic Profile

During the construction phase, a large labour force, including skilled, semi-skilled and un-skilled labour force of the order of about 13500 persons, is expected to work in the project area at peak construction activity period. It is expected of the total work force about 9700 shall be locally available and manpower to the tune of 3800 persons shall migrate from other parts of the district or adjacent districts of the state. This will lead to a small change in demographic profile of the area albeit during construction phase only. The temporary labour camps will be established at suitable location in the project area. The fuel need of the labourers/ workers shall be attended in an organized manner by providing LPG and safe drinking water so that any altercation between migrated labour and locals' overuse of natural resources and facilities is averted.

Hindus and Muslims constitute the pre-dominant religious community of the study area. They have deep religious faiths and celebrate festivals with great enthusiasm. During construction phase, migratory population though in limited numbers, is expected from other parts of the state having different cultural habits. However, no cultural conflicts are foreseen due to the migratory population, as they will be largely settled in separate conglomerates having all inbuilt facilities. Since major work force will be drawn from the local populace, which by interaction

with outside labour during course of construction, shall develop affinity and friendship with the outside workers, thus, minimizing the chances of conflict

4.7.2 Impacts on Socio-Economic Status

Apart from direct employment, the opportunities for indirect employment will also be generated which would provide great impetus to the economy of the local area. Various types of business-like shops, food-stall, tea stalls, etc. besides a variety of suppliers, traders, transporters will concentrate here and benefit immensely as demand will increase significantly for almost all types of goods and services. The business community as a whole will be benefited. The locals will avail these opportunities arising from the project and increase their income levels. With the increase in the income levels, there will be an improvement in the infrastructure facilities in the area.

4.7.3 Impact on Human Health Due to Water/ Water Borne Disease

Construction of the proposed project may cause impacts on health of local residents and the work force. Fuel and dust emission may cause respiratory problems like asthma for which mitigating measures like wet excavation of exposed surfaces shall be deployed. Frequent water sprinkling at least thrice a day shall be carried out on haul roads in the project activity area. All approach roads to site shall be metaled. Migrant workers might act as carriers of various diseases like AIDS, VDS, etc. The project authority should follow proper quarantine and screening procedures.

However, localized stagnation in borrow pit areas is expected during construction in some of the areas, which may require sprinkling of anti-bacterial/insecticides to control propagation of bacteria related disease. The influx of labour-force during construction warrants proper sanitation and hygiene facilities to avoid diseases related to sewage pollutants such as Typhoid, Cholera & Gastroenteritis.

4.7.4 Impact on Increased Traffic

Increased use of existing public infrastructure i.e., road due to vehicular traffic involved in transportation of construction materials and muck and earthmovers may cause congestion on roads. However, the state highway and the national highways in the district in general have been designed keeping in view the futuristic vehicular traffic. At present the level of convenience on the basis of traffic volume is “B” which shall not alter due to increased traffic on highways. However, due to increased traffic the impact shall be prominent on the village road (rural) and the level of confidence shall change from “A” to “C” **(Table 4.19)**. The increased traffic shall cause more fugitive dust emission and gaseous pollution, which when added to the existing concentration the resultant concentration shall be within the limits. Regular maintenance of road and copious sprinkling of water shall be carried. Transport trucks/tippers shall be properly maintained. Only PUC certificate issued vehicles shall be used. Avoiding of overloading of trucks beyond stipulated capacity by installing weighbridges at the check posts or near to it. Strict compliance of traffic rules and regulations shall be ensured. The movement of trucks/trippers/tractors for loading /transportation within the project area and haul road area

shall be regulated by a trained supervisor who shall be responsible for the safety of vehicle movement and prevention of accidents or incidents associated with the vehicular movement.

Table 4.19: Computation of Volume Capacity Ratio and LOS

Link Road to village	Design Service Volume PCU / Day	Existing Daily Traffic Data PCU / Day	Envisaged Traffic Movement Due to Project Activities PCU / Day	Cumulative Traffic Movement - Post Project Scenario PCU / Day	Volume / Capacity Ratio		Level of Service	
					Pre-Project	Post-Project	Pre-Project	Post-Project
Pothrireddy	6000	995	1800	2775	16.6	46.3	A	C
Tadparti	6000	1103	1500	2603	18.4	43.4	A	C
Ravalpally	6000	1195	1600	2837	19.9	47.3	A	C

4.7.5 Impact on Holly Places and Tourism

The project is located in districts of Mahabubnagar, Narayanpet, Nagarkurnool, Nalgonda, Rangareddy and Vikarabad with reservoir situated in rural set up away from the SH-35. The nearest place of tourist's importance is Hyderabad which is about 40 km from the reservoir and canal site. Thus, the proposed project shall create a substantial increase in tourism due to reservoir. For attracting people for picnic excursion, some picnic park shall have to be developed near reservoir with facility for water sports.

4.7.6 Impact of Blasting

Blasting is accompanied by the generation of the dust and the fumes and fly rock which pose a significant danger to the people who are in the vicinity of the work site. It also leads to ground vibrations which cause the ground to vibrate in transverse, longitudinal and the vertical direction leading to its damage. Due to blasting the people of the nearby villages are always physiologically impacted as they are constantly under apprehension of damage to their structures. Blasting also causes air overpressure is a transient impulse that travels through the atmosphere. Much of the air overpressure produced by blasting has a frequency below the audible limit of 20 Hz. Air overpressure, both audible and inaudible, can cause a structure to vibrate in much the same way as ground vibrations It is a frequent cause of the complaints as a person senses air overpressure more than vibrations. The noise due to air over pressure is instantaneous a short lived and may cause annoyance to vulnerable people

Blasting shall have adverse impact on fauna using the area contiguous with the surrounding habitation area as habitat. The noise generation has an adverse impact on terrestrial fauna and avi-fauna. Intervention in the project area will impact butterflies and birds which are quite sensitive to noise and human presence. The traffic noise has detrimental effect on the survival rates and breeding success of such fauna which reside in the small habitats along road side communicating using acoustic signals. Sometime as a result of habitat loss and physical disturbance, the fauna shall move from the habitat along road side. Based on the field observations and interaction with local people and forest officials it was noted that the project area does not constitute part of any wildlife migratory routes and mining activities won't affect animal movement.

All precautions shall be taken as envisaged under the relevant acts in respect of handling of explosive material and blasting which shall invariably be carried out by a qualified blaster.

4.7.7 Positive and Negative Impacts Likely To Be Accrued Due To Project

The positive impacts

The advent of project shall herald overt changes in the socio-economic conditions of the affected people and the population, living in command area, and the project affected zone who shall be directly benefitted. Some of prominent positive impacts are: -

- Irrigation potential shall be created in area (4,97,976 ha)
- Better living Standards for famers of command area.
- Employment opportunities/to locals in project work.
- Benefits to economy and commerce.
- Access to improved infrastructure facilities.
- Improvement in environment through implementation of different plans including CER.
- Command Area Development.
- Increase in groundwater level

Major negative impacts

Some of prominent major negative impacts are: -

- Due to project 14,891 families shall be affected due to land acquisition for phase -II works
- Due to project 5139 families shall be displaced due to submergence for phase -I works
- The loss of agriculture land (22600ha) and agriculture produce.
- Disturbance to the fauna of the study area during construction
- Pressure on the existing provincial / state road will increase.

4.8 IMPACT ANALYSIS -MATRIX

A simplified/modified two-dimensional matrix inspired by Leopold matrix has been adopted for the environmental and social impact assessment of the project. Twenty-three key impact factors have been singled out from a wider list of less significant potential factors.

The interaction of activities and their impacts vary between construction and operational phase. Regarding the irrigation project, major activities occur in the construction phase. Therefore, major impacts are anticipated during construction. Some of the impacts will be of short duration particularly during construction phase, whereas some impacts will be long lasting. Each impact was analysed under the categories mentioned above and quantified using modified Leopold matrix. Each impact was assigned with a score using a scale of 0-4, **(Table 4.20)** depending on the magnitude and potential. The magnitude, potential and significance of an impact were assessed on the basis of the nature of the impact (short term/long term. reversible/irreversible. local/regional. direct/indirect. minor/major). A positive or negative sign was provided for beneficial and harmful nature of the impacts. The rows' totals of the matrix reflect the total impacts of an action on the various environmental components while the columns' total ls reflect the impact of all actions on one environmental variable.

Table 4.20: Criteria for Evaluation of Impact

S.N.	Criteria	Score
1	No impact	0
2	Minor Impact	1
3	Medium Impact	2
4	Significant Impact	3
5	Major Impact	4

Table 4.21 and **Table 4.22** sum up the majority of the impacts during construction and operation phase of the project. Notably, the magnitude of negative impacts decreases considerably in the operational phase of the project. In the construction phase, total score is -38 of which 90 stands for negative impacts and 52 for positive impacts. During the operational phase total score changes to +21 of which negative impacts score are 18 and positive are 39. Considering the project actions during construction phase excavation, quarrying and migrant population are major activities which pose major impacts on the environmental and social components while community development is most positive impact.

Table 4.21: Environmental Impacts Matrix - During Construction Phase

Environmental Effects →	Physical Environment											Biotic Environment				Economic				Social and Cultural				Total -ve	Total +ve	Total
Development Activities	Landscape	Hydraulics of [illegible]	Water pollution	Air pollution	Noise pollution	Vibration	Land degradation	D/s water users	Exploitation of resources	Spread of Malaria	Ground water	Aquatic life and Fisheries	Fragmented [illegible]	Ecological balance	Stress on biodiversity	Employment	Social values	Basic Amenities	Marketing	Cultural conflict	Archaeological	Demographic changes	S.S. Business			
Dam excavation	-2	0	-1	-1	-1	0	-1	0	0	0	-1	0	-2	-1	-2	+2	0	0	0	0	0	0	0	-12	+2	-10
Road construction	-2	0	-1	-2	-1	0	-2	0	0	-1	0	-1	-2	-1	-2	+2	0	+1	+1	0	0	0	0	-15	+4	-11
Submergence	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dumping	-1	0	-1	-1	-1	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	-5	0	-5
Quarrying	0	0	-2	-2	-1	0	0	0	0	-2	0	-1	0	-1	-2	0	0	0	0	0	0	0	0	-11	0	-11
Colony	-1	0	0	0	0	0	-1	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	-3	0	-3
Diversion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canal	0	0	0	-2	-2	0	0	0	0	0	0	0	0	0	0	+2	0	0	0	0	0	0	0	-4	+2	-2
Vehicular Movement	0	0	0	-3	-3	0	0	0	0	0	0	0	0	0	-1	0	+1	+1	0	0	0	0	+1	-7	+3	-4
Migrant Population	0	0	-2	0	0	0	0	0	-2	0	-1	-2	0	-1	-2	0	-2	+4	+2	-3	0	-1	+4	-16	+10	-6
Land assets acquisition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	-4	-3	0	0	0	-3	0	-12	0	-12
Comm. Development	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+4	+2	+3	+2	0	0	0	+1	0	+12	+12
Command Area	0	0	-1	-1	-1	0	0	0	0	0	+2	0	0	+1	0	+3	+3	+4	+4	-2	0	0	+2	-5	+19	+14
Total	-6	0	-8	-12	-10	0	-4	0	-2	-3	0	-5	-4	-4	-9	+11	0	+10	+9	-5	0	-4	+8	-90	+52	-38

Table 4.22: Environmental Impacts Matrix - During Operation Phase

Environmental Effects →	Physical Environment											Biotic Environment				Economic				Social and Cultural				Total -ve	Total +ve	Total
Development Activities ↓	Landscape	Hydraulics of river	Water pollution	Air pollution	Noise pollution	Vibration	Land degradation	D/s water users	Exploitation of resources	Spread of Malaria	Ground water	Aquatic life and fisheries	Fragmented Habitat	Ecological balance	Stress on biodiversity	Employment	Social values	Basic Amenities	Marketing	Cultural conflict	Archaeological	Demographic changes	S.S. Business			
Dam excavation	0	-2	0	0	0	0	0	0	0	0	0	0	-1	0	0	+1	0	0	0	0	0	0	0	-3	+1	-2
Road construction	-1	0	0	0	0	0	-1	0	0	0	0	0	0	0	-1	0	0	+2	0	0	0	0	0	-3	+2	-1
Submergence	+2	0	-1	0	0	0	-2	-1	0	-2	0	+2	-1	-1	0	+2	+1	0	0	0	0	0	0	-8	+7	-1
Dumping	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quarrying	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colony	0	0	0	0	0	0	0	0	-1	0	-1	0	0	0	0	0	0	0	+1	0	0	0	+1	-2	+2	0
Diversion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canal	0	0	0	0	0	0	0	0	0	0	+3	0	0	+3	0	0	0	+1	0	0	0	0	0	0	+7	+7
Vehicular Movement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+1	0	0	0	0	0	0	+1	+1
Migrant Population	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+1	+1	-1	0	-1	0	-2	+2	0
Land assets acquisition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Comm. Development	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+3	+1	+3	+1	0	0	0	+1	0	+9	+9
Command Area	+2	0	0	0	0	0	0	0	0	0	+2	0	0	+3	0	+1	0	0	0	0	0	0	0	0	+8	+8
Total	+3	-2	-1	0	0	0	-3	-1	-1	-2	+4	+2	-2	+5	-1	+7	+2	+8	+3	-1	0	-1	+2	-18	+39	+21

CHAPTER 5 ANALYSIS OF ALTERNATIVES

The consideration of alternatives from environmental and project economics is one of the cardinal and proactive aspects in conception of a project. It is mainly instrumental for proper project planning, safe and economical designing and adoption of state-of-the-art technology through examining options instead of only focusing on the more defensive task of reducing adverse impacts of a single design. This includes the systematic comparison of feasibility alternatives to the proposed project, inter alia specific project site, technological and operational alternatives. Alternatives are compared in terms of their potential environmental impacts, project economics, and suitability under local conditions.

In the process of EIA, analysis of alternatives is the key tool to examine the extent of environmental impacts both beneficial and adverse, posed by the construction and operation of the proposed project vis-à-vis the environmental status of the region without the development of the project. It also involves comparison and environmental evaluation of the different alternatives proposed in the project. The assessment has been carried out for project alternative in no irrigation scenario, with and without project scenario and alternate sites.

5.1 PROJECT ALTERNATE

The project has been conceived to provide irrigation facility in Kharif and Rabi to CCA of 4,97,976 ha by utilizing excess flood water (90TMC) lifted during the flood season from the fore shore of the Srisailam Reservoir on Krishna River, by means of thirteen main canals, with combined length of 915.47 km, off taking from different reservoirs. The annual irrigation intensity of 115.2% of CCA (Kharif-495835 ha; Rabi-77887ha). In case available surface water resources are not harnessed, in order to achieve the contemplated annual irrigation intensity of 115.2%, ground water resource has to be tapped in command area where the net groundwater availability has been assessed as 668MCM against the total water requirement of 1410.91 MCM. The use of ground water resource in a draught prone area where 72% wells are showing a general falling trend is not at all logical, especially when surface water can be harnessed.

5.2 NO PROJECT SCENARIO

The existing(pre-project) gross cropped area in the command area of the project is assessed to be 4,01,606 ha (80.6% of the CCA), which after the introduction of project is projected to 573722(115.21% of CCA). The net value of produce before irrigation has been assessed as Rs.11,721.23 lakh shall hike to Rs 9,55,696.90 lakhs after introduction of irrigation facility in the area. Thus, with introduction of irrigation, sustained water availability to the tune of 82.52TMC for irrigation of Kharif and Rabi crops in the command area, the net incremental income due to the project in agriculture sector is assessed to be Rs. 9,43,975.67 lakh. In no project scenario the farmers will be deprived of this income, which is not in keeping with the Central Policy Food for all. Besides, the ever-increasing population in the state leads to the demand for increasing in food and fibre, production along with opportunity for opening vista of employment in rural areas by harnessing the available water resources to the optimum is need of hour.

The implementation of Irrigation scheme shall create employment opportunities in the project area. The employment is associated with improved farming practices as well as the construction of the main canal and distribution networks.

With irrigation additional farm labour would also be required as a result of higher cropping intensity through double cropping providing employment opportunities to local people within and outside the vicinity of the project area Further establishment of agro and ancillary industries would give rise to employment to the local people. Overall, the "no project" alternative is not a desirable option.

5.2.1 Environmental Conditions

The environmental conditions have been assessed in both the scenarios viz. with and without project for the two aspects viz.

- The impact of construction and operation of the project
- The environmental status of the area if the project is not undertaken.

The analysis has been carried out for the 'with project' and 'without project' scenario associated with hydrology, air quality, flora and fauna, socio-economic and infrastructure. No analysis has been carried out with respect to climatology and meteorological conditions which will be localized and insignificant impact on either of the scenarios.

Table 5.1: Alternative Analysis for Environmental Conditions

Issues	Without Project	With Project
Hydrology	The surface and groundwater hydrology will not be altered. The	The project envisions lifting of 90TMC @1.5 TMC in about 60 days during the flood season from the fore shore of the Srisailam Reservoir project on Krishna River Therefore, the most obvious impact hydraulic impact shall be alteration of the downstream flow regime during the period the water from the reservoir shall be lifted for storing in reservoirs for drinking /industrial and irrigation purpose. The project does envisage draft of 8.82 TMC underground water; therefore, underground hydrology will change to this extent. There shall be annual recharge of 1161.92 MCM (41.03TMC) due to the project.
Land use and Soil	The agricultural land including current fallows accounted for about 84.0% of total gross command area whereas, the non-agricultural land accounted for less than 16% of the total gross command area. This situation is not likely to change.	The land use class of 205.6 ha forest land diverted for Phase-I shall change into waterbody as well as built up area. The land use class of Patta land coming under submergence in reservoir shall change into waterbody. The land use class agriculture land (private land) and barren land (revenue) involved in canal

Issues	Without Project	With Project
		section shall change into waterbody and built-up area. The change shall be permanent and irreversible. The land use class of agriculture land required for project components and internal roads shall have land use class changed to built-up area. The implementation of various management plans viz. command area development, greenbelt etc. shall improve the land cover of the area. Hence the land use will improve in the long run.
Air Quality & Noise Level	Ambient air quality is good to satisfactory and noise levels are not high at present. Due to socio-economic factors and development activities in the area these are expected to deteriorate gradually with time.	Air quality may deteriorate during the construction period at project sites. However, this will be a temporary phenomenon, and will be confined to the location and duration of the construction activities. The air quality is thus likely to improve due to improved road conditions proposed in the project for transportation of construction material. The noise quality of the area is likely to be moderately affected during the operation phase and construction phase due to sporadic use of DG sets and increased traffic. However, since the DG sets will be housed inside enclosure and the increase in traffic will be negligible post construction, no significant adverse impact is envisaged.
Rehabilitation and Resettlement	No resettlement and rehabilitation issues arise without the project	Due to project 5139 families shall be displaced due to submergence for phase -I works. The PAF will be adequately compensated as per provision of RFCT LARR 2013.
Ecological Impact	The vegetation of study area comprises mostly of agro-ecosystem (cultivated land). The situation is not expected to change without project scenario. There will be no impact on wildlife in such a scenario	Due to diversion of forest land for reservoirs, there shall be loss of biodiversity and fragmentation of habitat. As buffer area of Amarabad Tiger reserve are very near to Phase-I approach channel, there shall be impact to the wildlife. However for project Phase-II,site selection throughout the length of the project is such that there is minimal tree cutting involved, the wildlife of the area will also not be affected other than during the construction phase for which Wildlife Management Plan has been formulated.

Issues	Without Project	With Project
Socio-culture issue	The residents are mainly cultivators and make a living by selling their produce in local market. However, with increasing population, requirement for other job opportunities is also being felt.	Due to project activities, local and regional people will get direct and indirect employment opportunities not only during construction phase but also during the operation phase, too. The staff residences are proposed for running and maintenance of the power plant. With proper measures no impact is expected on local crops.

5.3 ALTERNATE SITE STUDIES

The project is envisaged to lift water from foreshore of either Jurala Reservoir or Srisailam reservoir to K. P. Lakshmidevipally, as there were only two sources of water. Both are lift irrigation schemes and there are no chances for gravitational flow. There is no third alternative with regard to source of water.

As regards siting of 13 main canals, these are site specific as these are incumbent upon the site of reservoir from which they offtake.

A detailed study had been carried out for lifting water from Jurala Reservoir. Though Jurala is advantageous from the point of gradient, it could not be considered, because there is no adequate storage capacity in the project. The gross storage capacity of Jurala at FRL is 11.94 TMC, while the water requirement of proposed project is 90 TMC. Further, sufficient flood water is not available in Jurala. Hence it is not feasible to lift 90 TMC from Jurala Source.

The gross storage capacity of Srisailam Reservoir is 215 TMC. Thus, lifting of water from Srisailam Reservoir has been proposed, which is having sufficient capacity. With regard to Srisailam Reservoir two alternatives are explored. The details are as follows:

5.3.1 Alternative-1

In this proposal, flood water is lifted from Srisailam reservoir near Kalwakurthy Lift and dropped in to existing Yellur reservoir, from Yellur reservoir to Singotam reservoir by gravity with widening the existing canal system, from Singotam reservoir to Jonnalabogada reservoir by lift and widening the existing canal system, from Jonnalabogada reservoir to Gudipallygattu reservoir by lift and widening the existing canal system, from Gudipallygattu to Maganur by widening the existing Kalwakurthy main canal system, from Maganur to Marikal by gravity and lift and from Marikal it is linked to the system already prepared for Palamur –Rangareddy scheme from Jurala. In this proposal Pumps and tunnels are new and open canals are utilized by widening the existing canal system of Kalwakurthy. However, there is a possibility of delay in giving water to the proposed ayacut of 3.4 lakh acres under the existing Kalwakurthy Lift Irrigation Scheme (KLIS), since the pumping of water under KLIS may need to be suspended for taking up construction under PRLIS. Therefore, this proposal was dropped.

5.3.2 Alternative-2

Water is proposed to be drawn from Srisailam to Jannalabogada with tunnel and lift, from Jonnalabogada to proposed Vattem reservoir by gravity and lift, from Vattem reservoir to Markal by gravity and from Marikal it is linked to the system already prepared for Palamuru – Rangareddy scheme from Jurala. In this proposal Pumps, Reservoirs, open canals and tunnels are new. Existing Jonnalabogada reservoir is utilized.

5.4 REVIEW OF ALTERNATIVES 1 & 2

Meanwhile the Honourable Chief Minister has conducted review meeting with ENC (IW), CE(P), TREF and ESCI officials on Dt.15-5-2015 and seen the proposals of alternatives 1 and 2 prepared by ESCI. After having detailed discussions on above 2 alternatives, it is opined that in the alternative 2 proposal, the lift height is about 150 m and suggested to reduce the height of Lift to 100 m by introducing one or two more lifts in-between based on feasibility study in the ground. With the above objective, the following alternative proposals considering 5 Lifts and 6 lifts without linking the existing Kalwakurthy scheme were studied.

5.4.1 Alternative With 5 Lifts

Water was proposed to be drawn from foreshore of Srisailam reservoir to the proposed Narlapur Reservoir with gravity and lift, from Narlapur to proposed Yedula reservoir by gravity and lift, from Yedula reservoir to proposed Vattem reservoir by gravity and lift, from Vattem to proposed Lokerevu reservoir by gravity and lift and from Lokerevu it was propose to be linked to the system, already contemplated Palamuru – Rangareddy scheme with Jurala reservoir as source. In this proposal Pumps, Reservoirs, open canals and tunnels are new.

The Cost estimate (tentative) for the above alternatives i.e., with five and six lifts was prepared and the alternative with 5 lifts was found to be economical.

5.4.2 Final Acceptance & Choice of Project

The project is envisaged to lift water from foreshore of either Jurala Reservoir or Srisailam reservoir to K.P. Lakshmidevipally. A detailed study had been carried out for lifting water from Jurala Reservoir. However, lifting of water from Jurala Reservoir had been dropped in view of less storage capacity of that reservoir.

There were only two sources of water. Either water for the project has to be drawn from Jurala Indira Priyadarshini Reservoir or Srisailam Reservoir. Both are lift irrigation schemes and there are no chances for gravity flow. There is no third alternative with regard to source of water. Though Jurala is advantageous from the point of gradient, it could not be considered, because there is no adequate storage capacity in the reservoir. The gross storage capacity of Jurala at FRL is only 11.94 TMC, while the water requirement of proposed project is 90 TMC. Further, sufficient flood water is not available in Jurala. Hence it is not feasible to lift 90 TMC from foreshore of Jurala reservoir. The gross storage capacity of Srisailam Reservoir is 215 TMC. Thus, proposed to lift water from Srisailam Reservoir, which is having sufficient capacity.

Two alternative alignments have been considered from foreshore of Srisailam reservoir to Anjanagiri reservoir (first reservoir). The details are as follows with reference to alignment.

Finally, keeping in view of the Technical and also environmental superior because of less submergence of forest land Underground Pump house (alignment-2) from foreshore of Srisailam is selected than Open Pump house (alignment-1). Comparison of these two alternatives of alignment is presented in **Table 5.2**.

Table 5.2: Detailed Analysis of Alternative Alignments

Sl.No.	Description	ALIGNMENT -1 (Open Pump house from foreshore of Srisailam)	ALIGNMENT – 2 (Underground Pump house from foreshore of Srisailam)
1	Land Use and Land Pattern	The land along the main conduit is partly barren and partly sandy and rocky.	The land along the main conduit is partly barren and partly sandy and rocky.
2	Forest Land	About 309.54 ha	About 205.481 ha
3	Major Advantages	-------	The forest land submergence is reduced from 309.5 to229.04 ha Muck generation is less. Less impact on Ambient Noise levels during operation.
4	Major disadvantages	More Deforestation Delay in obtaining clearances which might impact the project cost.	None
5	Social Issues	Involves displacement	Involves displacement
6	Techno-economic Aspects	Open pump house	Underground pump house and marginally cost effective.
7	Conclusions	Even though this proposal is feasible in certain aspects the forest submergence is more in this alternative.	Alternative- 2 is environmentally superior because of less submergence of forest land than alternative -1. This proposal is technically feasible and economically viable.

The Cost estimates (tentative) for the above alternatives were prepared and the alternative with 5 lifts was found to be economical. The cost of project for utilizing flood water from Srisailam reservoir at the rate of 1.5 TMC/day and 2.0TMC/day for 60 days was worked out to be Rs. 36,000 Crores and Rs. 41,240 Crores respectively.

CHAPTER 6 ENVIRONMENTAL MONITORING PLAN

6.1 THE NEED

Sustainability of water resource project depends on continuous monitoring. Monitoring is an integral part of any environmental assessment process. Water resource development project creates a new environment with complex inter-relationships between people and natural resources. The magnitude of changes being created due to alteration of landscape, water, air and noise quality and other environmental parameters can be quantified and evaluated only by carrying out monitoring of various parameters during different phases of project construction and operation.

The monitoring and evaluation of environmental parameters indicates potential changes occurring in the environment, which paves way for implementation of rectifying measures wherever required to maintain the status of the natural environment. Evaluation is also a very effective tool to judge the effectiveness or deficiency of the measures adopted and provides insight for future corrections.

6.2 AREAS OF CONCERN

The PRLIS under Phase-I, entails the lifting mechanism and construction of reservoirs for water to be lifted from Sri Sailam reservoir. Under phase-II the construction of main canal and distribution system sprawling in five districts shall take place. The working area shall not be compact and construction activities shall not be confined to one location but shall be shifting with space and time. The construction mainly involving digging of canals, earthwork in making canal sections, canal masonry works like CD works, bridges shall bring about changes relating to water, air, noise, biodiversity of the area and plantation programmes need special attention from monitoring point of view during project construction as well post construction stages to judge the efficacy of measures implemented for conservation of environment.

6.3 ENVIRONMENTAL MONITORING

The overall impact assessment of the proposed project was carried out and monitoring plans have been framed based on the severity of impacts in different areas. During the EIA study, it was observed that the air quality and water quality are not going to be affected significantly and only, temporary changes in these parameters are expected. The preventive/ curative measures to reduce the ill effects of construction activities on these parameters have been suggested under various plans. A holistic approach has been adapted for monitoring of air, noise and water related factors under different heads with suitable financial provisions for their implementation.

6.3.1 Air Quality Monitoring and Management

Pollutants, which may be generated during the construction phase of the project, will alter the local environment temporally and shall subside once the major constructional activities are over. During the construction phase of the project, the ground level concentration of the pollutant like

SO_2, NOx and PM_{10} are likely to increase but shall be within the threshold limit especially in surface excavation areas. It should be made mandatory on the part of the contractors that they use the required equipment for monitoring gaseous pollutants in and around the project and submit a detailed report every fortnight to the project authorities for evaluation and monitoring purposes. The air quality in and around the project area can be improved by the application of following practices/ methods.

- Excavation work may be carried out by pre-splitting and controlled blasting techniques
- Control blasting be carried out as far as possible and use of explosive be bare minimum.
- The type of explosive used in blasting may be selected as per the requirement.
- To settle down the dust in project area especially around crushing plants, excessive use of water sprinklers is the best method.

The work of Air Quality Monitoring may be assigned to either State Pollution Control Board or any other agency approved by the MOEF. Quarterly monitoring of air quality parameters such as SO_2, NOx and PM_{10}shall be carried out during construction period and one year in post construction phase.

For works under Phase-I, the monitoring sites shall be where maximum project activities in terms of excavation and concreting are involved like Pumphouses, Delivery tanks, Surge pools, reservoir embankment where reservoir depths are maximum and at locations near to habituated area/settlements. Based on this criterion and considering that the work shall be carried out through 21 contract packages, it is proposed to carry out monitoring at 21 locations

For works under Phase-II, the monitoring site should be at the head reaches/head regulator of each main canal off taking from reservoir and also at the point of bifurcation of canals. Besides this monitoring should also be carried out near the canal reach where maximum project activities in terms of excavation and concreting are involved like major CD works/cross regulators /bridges. Based on this criterion and considering that there are 13 canals, it is proposed to carry out monitoring at 25 locations.

6.3.2 Noise Quality Monitoring and Management

The level of noise will rise above threshold level in the project area due to different types of construction activities: blasting for tunnels, powerhouse, dam etc., movement of heavy and small vehicles and the crushing plants. All these activities will generate high noise and vibrations, which can cause health hazards among the labors, local inhabitants and wildlife present in the area. Therefore, it would be most appropriate if following measures are rigorously applied during construction phase of the project.

- Continuous monitoring of sound pressure levels within the project area.
- Extensive plantation to be carried out in the project area as plants absorb sound and make a barrier for its travel to long distances.
- Pre-split and controlled blasting.
- Provision of Air muffs to workers working in high noise levels zones.
- Periodical maintenance of earthmovers, batching and mixing plant and crushing plants.

Monitoring and measuring the sound level can be again assigned to either State Pollution Control Board or any other external agency. Quarterly monitoring of noise quality in ambient air shall be carried out during construction period and one year in post construction phase.

For works under Phase-I, the monitoring sites shall be where maximum heavy earthmovers and construction machineries are deployed for project activities like excavation and concreting. Such locations where high noise levels could be expected are like Pumphouses, Delivery tanks, Surge pools, reservoir embankment where reservoir depths are maximum and at locations near to habituated area/settlements. Based on this criterion and considering that the work shall be carried out through 21 contract packages, it is proposed to carry out monitoring at 21 locations, which could be the same where air quality monitoring shall be done

The monitoring sites for Phase-II works should be at the head reaches/head regulator of each main canal off taking from reservoir and also at the point of bifurcation of canals. Besides this monitoring should also be carried out near the canal reach where maximum project activities in terms of excavation and concreting are involved like major CD works/cross regulators /bridges. Based on this criterion and considering that there are 13 canals, it is proposed to carry out monitoring at 25 locations.

6.3.3 Water Quality Monitoring and Management

Water is one of most precious natural resources. Human beings are highly dependent on water for various purposes such as domestic needs, sanitation irrigation, industry, and disposal of wastes etc. The water of river bears some load of silt mainly from bank erosion and domestic wastes. Further, due to congregation of labourers during the construction phase, the water quality in this stretch may get deteriorated if proper sanitation facilities are not provided to them.

The MoEF&CC has prescribed guidelines for the maintenance of water quality standards o (IS: 10500-2012), which must be followed and for inland surface water CPCB Water Quality Criteria based on best designated use should be followed. The water quality in and around the project area may, therefore, be monitored regularly, and certain necessary corrective measures be introduced accordingly to maintain it.

6.3.3.1 Proposed Water Quality Monitoring Plan

It is anticipated that during the construction period of the project the generation of waste water from construction sites, residential colonies and labour camps may increase and facilitate transport of sediment laden waters to the river. Pollutants resulting from the sewage waste would degrade river water quality further. The following measures are therefore, proposed for water quality management:

- Sufficient water should be supplied to the labour camps and residential colonies
- Water should be treated before use to prevent pathogenic and coli form organisms
- Sewage waste be released in river only after proper treatment

It is proposed that the sediment-laden water from different project components may be collected in sedimentation tanks/water tanks to dislodge the sediments before releasing the

sediment free water to river/streams.

Adequate solid waste management practices be adopted in colonies and labour camps as suggested in solid waste management plan. It would be eco-friendly if sewage water after disposal of solid waste may be used in watering of parks and gardens. In addition to this, periodical monitoring of water for its physico-chemical and bacteriological parameters may be conducted quarterly at labour colony and other surface water/ground water source. The water samples shall be grabbed preferably at 21 and 25 sites respectively for Phase-I and Phase-II, subject to actual requirement at the time of construction. Monitoring shall be carried out twice a year during construction and one-year post-construction. The water quality parameters to be monitored quarterly are shown in **Table 6.1**.

Table 6.1: Water Parameters to be Monitored

Parameters	
pH	DO
Electrical Conductivity	BOD
Turbidity	COD
TDS	Total Coliform
Total hardness	E-Coli

6.3.3.2 Monitoring of Incidences of Water-Related Diseases

Identification of water related diseases, adequacy of local vector control and curative measures, status of public health are some of the parameters, which need close monitoring. The monitoring of water related vectors may be executed in collaboration with State Health Department and they may preserve data so generated for future reference. Monitoring shall be carried out twice a year during construction and one-year post-construction.

6.3.4 Soil Quality Monitoring& Management

The transportation of excavated/construction material on unpaved roads and excavation results inland degradation and formation of loose soil particles which are mainly fugitive dust. cause fugitive dust emission. These dust particles are usually blown away along the wind direction and get deposited on the canopy of surrounding vegetation and agricultural crops thereby resulting in reduced ecological functions of the forest ecosystems as well as economic productivity of the agro-ecosystems. The following measures are, therefore, proposed for soil quality management:

- At the feeding points stone crusher air mist spray shall be carried out.
- Wet drilling shall be carried out
- Copious sprinkling of water on unpaved access/approach roads
- The leakage of POL and washings of workshop floors bring oil and grease with it. It shall be collected in oil separators before disposal on land. The soil contamination with oil shall be totally avoided.

Sampling and analysis of soil can be again assigned to either TSPCB or any other external agency. The financial implication for taking grab samples of soil and analysis for parameters like texture, macro-nutrients, Sulphur, organic carbon, pH and EC and other physical parameters is proposed for every six months during construction phase and post construction phase for one year.

The soil samples shall be grabbed preferably at 21 and 25 sites respectively for Phase-I and Phase-II, subject to actual requirement at the time of construction,

6.3.5 Monitoring of Erosion

In the initial years after construction and during construction period so long as the canal banks particularly in heavy filling reaches are not stabilized, these are amenable to slip. During rains some time rills are formed on the surface and in heavy rains erosion takes place. Therefore, project proponent shall monitor the stability of canal banks and spoil banks along canal, which shall be closely monitored during monsoon season by regular patrolling of the constructed canal segments of main canals, branches and distributaries. Special vigil should be kept for filling sections of canals. on this count, a financial provision of **Rs 3.0 lakh** for monitoring s being made. In post-construction the responsibility of monitoring shall rest with the project proponent.

6.3.6 Environment Monitoring Through Remote Sensing Technology

The use of remote sensing technology can be aptly made for monitoring of the progress of the works proposed under catchment area treatment, compensatory afforestation, and green belt. This can be achieved by the periodically study of digital satellite data IRS P6 LISS-IV for the specific site and evaluated on ERDAS imagine software. The standard False Colour Composite (FCC) generated by assigning blue, green and red colours to visible green, visible red and near infrared bands respectively. Expressing image pixel addresses in terms of a map coordinate base is often referred to as geo-coding. As various thematic layers are to be overlaid for this project, all the layers shall be geo-referenced to real world coordinates. The comparative study of change in land use pattern, the change in extent of vegetal areas, the growth of new plantation, the development of new landslide zones can be established by periodical study of the scene obtained from the satellite. The technique can also be made use of in establishing the expanse of sedimentation in the reservoir by comparing the scene obtained from remote sensing after every three years or so.

6.3.7 Ecosystem Studies

Efficacy of conservation measures implemented in treatment plan such as afforestation and soil conservation measures, and their effects on flora, terrestrial fauna, aquatic fauna (fish migration) are the aspects, which should be evaluated and monitored under the head monitoring of ecosystem. The findings of this study should be made available to authority implementing plans, restoration of muck disposal and quarry a reason periodic basis so as to make necessary change if need arise and the implementation more meaningful during construction and operation phase of the project. Since, the study is subject specific, services of expert agencies will be required to carry out the same. Therefore, the financial provision of **Rs. 5.0 Lakh** has been provided in the final cost estimate of environmental monitoring plan. This fund will also take care of the expenditure for other studies, which are required by the regulatory authority from time to time and also cater to the needs of expenditures to be incurred on public awareness programmes for environmental conservation.

6.3.8 Monitoring of Socio-Economic Structure

During transfer phase of the affected property / assets, the monitoring should be carried out to assess changes and discrepancies in respect of number of PAF and their aspects as evaluated before the statutory deadline fixed by the government. Besides this, monitoring of implantation of various community development schemes / programmes need to be carried out every quarter so that the benefits from these schemes accrue expeditiously. The monitoring needs to be carried out *pari-pasu* with the implementation of R & R plans and social development works and also two years after completion of these plans in order to assess the socio-economic changes brought about due to establishment of the project.

6.3.9 Sharing of Monitoring Results

The results of monitoring of various environment attributes either during or post construction would be shared by the monitoring agency, whosoever including State Pollution Control Board, with the project proponents and other agencies of the Government as and when required. Monitoring agency may disseminate the results in any other forms.

6.3.10 Cost of Environment Monitoring Programme

The total cost of environment monitoring plan works out to **Rs 405.00 lakh** and is given in **Table 6.2**.

Table 6.2: Summary of Environment Monitoring Programme

S. N.	Aspect	Parameters to be monitored	Frequency		Location	Cost Estimate (Rs. lakh)			Implementing and Pursuing Agency
			During Construction	During Operation		During Construction	During Operation	Total	
Phase-I									
1	Air Quality monitoring	SO_2, NO_X, PM_{10}	Quarterly for 3.0 years	Quarterly for 1 year	21	80.64	26.88	107.52	T.S.P.C.B or any approved agency of MOEF
2	Noise Quality Monitoring	Noise level	Quarterly for 3.0 years	Quarterly for 1 year	21	8.40	2.80	11.20	T.S.P.C.B or any approved agency of MOEF
3	Water quality Monitoring	All parameters given in water quality	Quarterly for 3.0 years	Quarterly for 1 year	21	25.20	8.40	33.60	T.S.P.C.B or any approved agency of MOEF
4	Soil quality Monitoring	All parameters given in soil quality	Half yearly for 3 Year	Half yearly for 1year	21	13.44	4.48	17.92	T.S.P.C.B or any approved agency of MOEF
5	Water-related diseases	Identification of water-related diseases.	Half yearly for 3 Year	Half yearly for 1year	Villages adjacent to project sites	6.00	1.00	7.00	C. M. O. of districts involved
					Total Phase-I	**133.68**	**43.56**	**177.24**	
							Say	**177.00**	
Phase-II									
1	Air Quality monitoring	SO_2, NO_X, PM_{10}	Quarterly for 2.5 years	Quarterly for 1 year	25	96	32	128	T.S.P.C.B or any approved agency of MOEF
2	Noise Quality Monitoring	Noise level	Quarterly for 2.5 years	Quarterly for 1 year	25	12	4	16	T.S.P.C.B or any approved agency of MOEF
3	Water quality Monitoring	All parameters given in water quality	Quarterly for 2.5 years	Quarterly for 1 year	25	30	10	40	T.S.P.C.B or any approved agency of MOEF

4	Soil quality Monitoring	All parameters given in soil quality	Half yearly for 2.5 Year	Half yearly for 1year	25	15	5	20	T.S.P.C.B or any approved agency of MOEF
5.	Water-related diseases	Identification of water-related diseases.	Half yearly for 2.5 Year	Half yearly for 1year	Villages adjacent to project sites	8	2.	10	C. M. O. of districts involved
6.	Erosion	Soil erosion	Monsoon		Canal site	2.0	1	3	Project Proponent
7.	Ecosystem monitoring	Wild life census, field surveys	Once	Once	Command area of project	5	0.00	5	Forest Dept. or WII
8.	Celebration of Environment Day		Yearly	-	At Block H.Q.	6	0.00	6	Forest Dept.
Total Phase-II						**174**	**54**	**228**	
Total Phase-I&II						**308**	**97.00**	**405.00**	

CHAPTER 7 ADDITIONAL STUDIES

7.1 GENERAL

After having gone through the various aspects of project activities involved in construction of dam at the proposed site and the related documents like Form–I and PFR, the MoEFCC, set out the scoping clearance and issued ToR for environmental impact assessment studies and preparation of environmental management plan for the project and for submission of report. The Terms of Reference issued by the MoEFCC are very comprehensive and subjective covering every aspect of project activity and the related environmental issues to be addressed.

7.2 PUBLIC CONSULTATION

There is a general optimism for the upcoming PRLIS project in the area. During the Focused Group Discussions (FGDs) with Panchayats, the villagers and secondary stakeholders were also found to have a very positive opinion towards the project as it would bring an overall development to the entire area in terms of infrastructure development (both Social and Physical) and increase in employment and business opportunities. Also, they anticipated the increase in land prices of the area which would be a beneficial factor for them.

However, they were also apprehensive about the negative impacts that may rise from the project if not properly mitigated. There were concerns regarding the rise in disputes among stakeholders for receiving the compensation and that the vulnerable groups may be left out or be cheated. Another possible impact is that on receiving the compensation amount, there would be a change in the financial condition of the PAFs which in turn would alter their purchasing capacity and would also increase the risk of fund miss-management as many of the landowners are not properly educated, especially regarding financial management. The project area may also experience rise in cases of frauds and cheats once the compensation amount is distributed. There are also chances of changes in cultural practices and traditions because of changes in the spending pattern.

During the construction phase of the project, the stakeholders had a positive outlook towards the project as it would generate good direct and indirect employment and business opportunities for them. Due to in migration they would witness increased consumption of goods which would benefit the local economy. However, they also showed concerns regarding the in migration of labour for the project as it would raise the pressure on existing infrastructure like health facilities, educational facilities, roads etc. There may be chances of rise in conflicts among the locals and the in-migrants and the stakeholders also opined that there are chances in rise in crime rates and anti-social activities in the area because of migration. The area may also witness cultural mixing. Further, there would also be problem of traffic, air and noise pollution because of the heavy transport vehicles, material transport and construction. The area may also witness rise in health problems due to increased pollution levels

During the post construction phase, the stakeholders opined that the area may witness reduced pollution and better living environment. A cultural stability may also be witnessed during this stage.

7.3 PUBLIC HEARING

In consonance with the EIA notification 14th September 2006, vide section 7(i) related to public consultation, the draft report shall be submitted to the SPCB for conducting public hearing within the validity period of 5 years as applicable under Notification dated 17.2.2020. Since the project area is covered in six districts, the public hearing shall be caused in all six districts.

Environmental Public Hearing was conducted by Telangana State Pollution Control Board on 10th August, 2021 simultaneously in six districts namely Mahabubnagar, Nagarkurnool, Rangareddy, Vikarabad, Nalgonda and Narayanpet DIstricts. The notice for conducting of public hearing was published in 'Namesthe Telangana', Telugu Newspaper and in 'Telangana Today' English Newspaper on 10.07.2021. The draft EIA report along with Executive Summaries in Telugu and English on the project was displayed at the offices of the local bodies and the Collectorate to enable the people to access the information. The details of public hearing held in six districts are enclosed as **ANNEXURE IX**

7.3.1 Public Hearing in Mahbubnagar District

The meeting was presided by the panel members namely Sri S. Venkata Rao (IAS District Collector and Magistrate Mahbubnagar District), Sri M. Dayanand (T.S. Pollution Control Board, Environmental Engineer, Regional Office, Hyderabad); government department officials namely Sri Tejas Nandala Pawar (IAS, Additional Collector, Mahbubnagar District), Sri K. Seetarama Rao (Additional Collector, Mahbubnagar District), Sri D. Narsing Rao (Superintending Engineer, I&CADD, Irrigation Circle No.1, Mahbubnagar) and Sri S. Krishna Mohan (Executive Engineer, I&CADD, Irrigation Division No.4, Mahbubnagar).

At the outset, while welcoming the gathering, the reprehensives of Regional Office TSPCB informed about the objective for conducting public hearing. He also invited the stake holders to give without fear their viewpoints/suggestions in respect of their concern about the project and also their views on environmental aspect of the project.

Further he invited the public to share their opinions about the proposal and requested the chairman -Environmental Public Hearing, District Collector Mahbubnagar District to preside over the public hearing and conduct the proceedings.

The gist of issues raised and the replies of the project proponent are described in **Table 7.1**

Table 7.1: Gist of Issues Raised and Replies /Assurance of Project Proponent

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
1	Sri Venkat Ram Reddy R/o. Konagatpally (V), Hanwada (M):	He welcomed the project which would result in agricultural development of the district and expressed hope of reverse migration after the completion of the project	The project proponent thanked the stakeholder for supporting the project.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
2.	Sri B.Naganna, State Secretary, PBUV, Hanwada	He welcomed the project as it is very helpful for the development of drought prone district. He desired that the details of compensation to be paid to the small and marginal farmers should be spelled.	The project proponent thanked the stakeholder for supporting the project. The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report)
3.	Sri Konda Laxmaiah R/o Hanwada	He stated that this project is 20 years dream of the farmers. He stated that many people are migrating for work to different places i.e., Pune, Bombay due to insufficient rainfall & water scarcity. This project can remove poverty of the district people and stop migration of people to other states. Further he requested for providing a map showing the passage of the Canal, details of villages and mandals for accessing the loss of natural resources and also requested for providing the reasonable compensation equal to the existing market price to the small and marginal farmers.	The project proponent has agreed to give the map as requested by him through concerned authorities and informed that to get the total plan regarding the project will be available in the office of Superintending Engineer, Mahbubnagar. The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report)
4.	P.Ram Reddy, Vice President, Telangana Retired Engineers Association	He thanked the Government for proposing such a prestigious project of Palamuru Rangareddy Lift Irrigation Scheme. He mentioned that there is no air & water is polluting and no environment impact arising due to the construction of the project as per the study of M/s. Voyants Solutions PVT Ltd and also opined that the negatives of the project are very smaller than that of the positive outcomes.	The project proponent has thanked the stakeholder for supporting the project. For mitigation of various adverse impacts management plans have been proposed (Chapter 10 of report)
5.	T. Venkatesham, Chairman, Telangana Engineers JAC	He opinion that the reverse migration of the people can be except due to this project. He requested to complete the project by working day & night.	The project proponent thanked the stakeholder for supporting the project. The work of project shall commence after getting all statutory clearances.
6.	Sri Srinivas Reddy, ZPTC, Gandeed	While expressing his gladness for the public hearing appreciated the government for taking up Palamuru Rangareddy Lift Irrigation Scheme project. He further, requested to complete the project as early as possible to get the benefits of the project.	The project proponent thanked the stakeholder for supporting the project. The work of project shall commence after getting all statutory clearances.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
7.	Karunakar Goud, TRS Member	He stated that no objection towards taking up the project.	The project proponent thanked the stakeholder for supporting the project.
8.	Vepuri Yadi Reddy, Member of Congress Party	He stated that, the Palamuru-Rangareddy Lift Irrigation Scheme was a long-time dream and it has come to reality now which is a pride for the mandal. He also stated that, the compensation towards the land acquisition received by the small and marginal farmers is very low and requested to compensate an amount of Rs.30.00 Lakhs to Rs. 50.00 Lakhs per acre or to provide a Government Job to them.	The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report). Employment shall be subject to RFCTLARR 2013.
9.	Sri V. Narayan Goud, Executive Engineer (Retd.)	He expressed hope of earliest completion of the project and requested the government to give compensation as per the Act.	The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report). The work of project shall commence after getting all statutory clearances. .
10.	Sri Mattagalla Venkataiah ,vevesaya vrutti darula union	He mentioned that, in the process of the construction of the project, rights of the farmers should be protected and requested to give the compensation to the farmers who lost their land as per the 2013 Act and he suggested to take proper precaution during construction of the project and requested to provide the map showing the passage of the canal. He also stated that due to lack of information about the public hearing, many people could not be part of the public hearing.	It was explained that, paper publicity in Namasthe Telanagana & The Hindu has given month before the public hearing and wide publicity was given through dandora about the public hearing and also through paper publications, display letter & Executive summary also provided in villages & Gram Panchayats. The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
11.	Sri laipal Reddy, Farmer, Kothur Village of Bhoothpur Mandal	He expressed his sadness for losing 25 acres of his land for the Karvena Reservoir and stated that the hon'ble Chief minister has promised to provide a Government Job to each family who are losing their lands, but so far, no job was provided and requested to provide job before starting of the project.	The District Collector, Mahabubnagar has asked him to meet at the District Collector's Office so as to do the needful.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
12.	Sri Anjaneyulu, Ex-Market Committee Chairman	Opined that the Palamuru-Rangareddy Lift Irrigation Scheme is helpful in eradicating the drought from the district and welcomed the project.	The project proponent thanked the stakeholder for supporting the project.
13.	Sri Mallu Narsimha Reddy, R/o. Ramchandrapur	He stated that the Palamuru-Rangareddy Lift Irrigation Scheme is a dream which has been fulfilled after 75 years of independence. and requested for the early approval of the project.	The project proponent thanked the stakeholder for supporting the project.
14.	Sri Mallu Devender Reddy, President, Raithu Bandu, Mahabubnagar Mandal	Palamuru lift irrigation project can solve migration problem and expressed his hope of reverse migration after the completion of project. and requested to provide compensation to the farmers who lost their lands.	The project proponent thanked the stakeholder for supporting the project. . The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
15.	Sri Venkata Ramana Reddy, Sarpanch, Gandeed Village and Mandal	He stated that The Palamuru-Rangareddy Lift Irrigation Scheme is helping the farmers in betterment of their life style and requested for detailed map of canal passage of Palamuru-Rangareddy Lift Irrigation Scheme Stage II	The District Collectors informed that the necessary instruction has been given to the irrigation department to provide the data of Laximidevipally village.
16.	Sri Jambulaiah, MRPS leader, Hanwada	He welcomed the project.	The project proponent thanked the stakeholder for supporting the project.
17.	Sri M.B. Balakrishna, Rathu Rajyam State President, Telangana	He stated that the project is welcomed but only with the justice done to the people who lost their lands towards acquisition and requested that the land acquisition should be made as per the Land Acquisition Act, 2013.	. The project proponent thanked the stakeholder for supporting the project. The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
18.	Sri Laxmi Narayana, Sarpanch, Sallonipally (V), Hanwada Mandal	He stated that the project is welcomed with a minimal loss to the small and marginal farmers.	The project proponent thanked the stakeholder for supporting the project.
19.	Sri Jogu Krishnaiah Goud, R/o.Gandeed	He stated that, the survey for the Palamuru-Rangareddy Lift Irrigation Scheme has been conducted in the supervision of the Retired Engineers in the year 2015 and requested to utilize the services and knowledge of the Retired Engineers. He also stated that the employment of 6000 to 7000	The project proponent stated that the knowledge of the retired Engineers will always be helpful in all the projects. and also assured to provide the employment to the local only. Employment shall be subject to

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
		should be given to the local villagers only.	RFCTLARR 2013.
20.	Sri I. Krishnaiah Goud, Vice Chairman, FACS	He stated that, the farmers who have the lands of 2 & 3 acres unable to do the cultivation as no borewell & rainfall water is available, so the people are migrating and working as a labour. He opined that due to this project drought prone district can be called as Annapurana" district.	The project proponent thanked for the suggestions and appreciated him for the concern shown
21.	Sri Chennaiah, M.P.T.C., Konagatpally (Nainonipally)	He described the horrible situation of drought due to insufficient rainfall and depleted ground water levels in the district and expressed his hope towards overcoming such situations after completion of the project.	After introduction of irrigation facility, there shall be improvement in groundwater scenario due to recharge from seepage from reservoirs, canals and due to field application(699.83MCM).
22.	Mannan, Gundailla co-operation, Hanwada	He welcomed the project and appealed the public to no objections are made against the project as there is no impact on environment and he welcomed the project.	The project proponent thanked the stakeholder for supporting the project.
23.	Sri Anantha Reddy, Farmer, Hanwada	He welcomed the project and expressed that no impact on the environment due to this project. Further, he stated that the farmers who lost their land due this project can be given government land at other places and expressed that,	The impact due to project have been identified and mentioned in the report and explained in the meeting.
24.	Sri Balaji, Ex-Sarpanch, Thirmalagiri Village	Welcomed the project.	The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report) The employment shall be subject to RFCTLARR 2013.
25.	Sri Ramulu, R/ o. Sallonipally Village	Stated that, small and marginal farmers must be helped with good compensation or Government Jobs and, the government land should be allotted to them and also stated that the useful plantation must be made along the canal.	The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report). The employment shall be subject to RFCTLARR 2013. Green belt shall be developed along canal roads and other areas for which Rs 2964 lakhs have been provided (Section 10.6)

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
26.	K.M. Narayana, Ex-Sarpanch, Nancherla, Gandeed	Welcoming the project. requested to complete the project early. .	The project proponent thanked the stakeholder for supporting the project. The work can be started only after getting EC.

7.3.2 Public Hearing in Nagar Kurnool District

The meeting was presided by the panel members namely Sri L. S. Harman (IAS, Collector and District Magistrate Nagarkurnool District), Sri D. Krupanand (TJoint Chief Engineer, TS Pollution Control Board, Zonal Office, Hyderabad); officials and representatives namely Sri P. Srinivas Reddy (Additional Collector and Revenue, Nagarkurnool District), Sri G. Vijaya Bhaskar Reddy (SE, Irrigational Dept., Nagarkurnool DIstrict), Sri S. Rajesh Kumar (RDO, Kalwakurthy (M) Nagarkurnool District) and Sri M. Krishna (Tahsildhar, Veldanda (V), Kalwakurthy (M), Nagarkurnool District). and the gist of issues raised and the replies of the project proponent are described in **Table 7.2.**

Table 7.2: Issues Raised and Replies /Assurance of Project Proponent

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
1	Smt.Vijitha Reddy, Cherkuru Village	She expressed hope that this project has no impact on environment and requested to complete at the earliest.	The impact due to project have been identified and mentioned in the report and explained in the meeting. The work of project, under Phase-II, shall commence after getting all statutory clearances. .
2.	Bhoopathi Reddy, Veldanda, Sarpanch.	Opined that, they are fortunate enough to get the project and expect ground water recharge. He requested the Project authorities to complete as soon as possible. Lastly, he opined that this Project has no impact on Environment.	After introduction of irrigation facility, there shall be improvement in groundwater scenario due to recharge from seepage from reservoirs, canals and due to field application(699.83MCM). The work of project shall commence after getting all statutory clearances.
3.	P. Kishta Reddy, Veldanda	He expressed that this Project is a dream of decade. and also requested for righteous amount of compensation.	The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
4.	Balayya, AMC, Chairman, kalwakurthy	He expressed that, this project has no impact on environment as project area does not involve any monuments, temples etc. He requested to complete at the earliest.	The work of project, under Phase-II, shall commence after getting all statutory clearances.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
5.	BhaskaraRao, Veldanda	He expressed that this Project is proposed to irrigate the lands in drought prone area and the Project has no impact as it does not involve any dense forests, tiger reserves, no precious species. He further added that, due to this Project ground water will increase, which turns these drought prone lands as vegetated lands.	After introduction of irrigation facility, there shall be improvement in groundwater scenario due to recharge from seepage from reservoirs, canals and due to field application(699.83MCM).
6.	Guruvaiah Goud, SACS Chairman, Vangoor, Veldanda	He expressed that this Project has no impact on environment.	The impact due to project have been identified and mentioned in the report and explained in the meeting. .
7.	Bejja Yadaih Goud, Charakonda	He supported the project and is expecting drinking water from this project.	The project proponent thanked the stakeholder. The drinking water shall be available after completion of Phase-I. .
8.	Venkata Ranga Reddy (Rtd.E-in-C), Singotam Village, Kollapur	He expressed that, in PRUS Reservoirs are formed with a bund length of 65 kms. and he tried to explain the different types of soils are required for banking and it is required to inform from where these soils are acquired for banking. While stating that Kosgi Venkataiah have petitioned a case in High court regarding mining of soils in Telangana area for the purpose of Project use. Briefing the case, he said that, Black Cotton soils are to be used for banking. He further, stated that this dredging process is indirectly helping the tanks to store to its full capacity and there by using for reservoir bund foundation. He opined that, the word used by Kosgi Venkataiah mining is wrong and it is dredging and it is very much useful. Lastly, he briefed that this project has	The project proponent D thanked for the suggestions and informed that the suggestions given will be considered. As regards the petition filed by one Sri Kosgi Venkataiah, no comments, as the case is sub-judice.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
		least impact on Environment. We get water from this Project, thereby increase in greenery, Oxygen level in atmosphere. Further, told that lively hood also increases.	
9.	Alwal Reddy, Kotra	He requested the Project authorities to complete the PRLISS on fast track and also requested to announce righteous compensation to the land losers.	The work of project, under Phase-II, shall commence after getting all statutory clearances. The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
10.	Parvath Reddy	He requested project authorities to complete the project on fast track and also demanded a righteous compensation for land losers.	The work of project, under Phase-II, shall commence after getting all statutory clearances. The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
11.	Edla Satyam, Chairperson, Muncipal Council, kalwakurthy	Once they got the water through KLI canal, they are getting good rain falls. He feels that, environment is balanced.	The impact due to project have been identified and mentioned in the report and explained in the meeting
12.	Balaji Singh, ZP Vice Chairman	He requested the Project authorities to complete as early as possible. and also, to release the compensation to the land losers immediately.	The work of project, under Phase-II, shall commence after getting all statutory clearances. The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
13.	Narayana, vangoor	He told that with the PRLIS Project, there is no impact on the environment.	The impact due to project have been identified and mentioned in the report and explained in the meeting.
14.	A. Vijay, Lingareddypalle	He expressed that no Compensation paid to the land losers. He requested to compensate at the earliest. Further expressed that there is no impact on Environment with PRLIS Project.	The compensation shall be paid after Socio-economic survey for phase-II, is completed and all proceedings under the Act are completed.
15.	V.ShankarNaik, KlayaniTanda	He expressed that no compensation paid to the land losers. Further, expressed that with PRLIS Project, there is no impact on the environment.	The compensation shall be paid after Socio-economic survey for Phase-II, is completed and all proceedings under the Act are completed.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
18.	Sudarshan Reddy	He requested to release early compensation to the land losers and requested the Project authorities not to delay.	The compensation shall be paid after Socio-economic survey for phase-II, is completed and all proceedings under the Act are completed. .
19.	P. Ramulu, Cherlaltikyala	He expressed that PRLIS have no impact on environment. and also requested to release the land compensation at the earliest.	The compensation shall be paid after Socio-economic survey for phase-II, is completed and all proceedings under the Act are completed.
20.	Motilal, Ragbaipally	He expressed that, since his childhood he is listening about the PRLIS project. Still the work is going on. Further, expressed that, there is no impact on Environment with this Project.	The impact due to project have been identified and mentioned in the report and explained in the meeting.
21.	Shekhar Reddy, kalwakurthy	He expressed that, he came to know that PRLIS Canal alignment is passing through Klawakuthy and it is affecting patta lands in that town. He requested to de-route the canal and to see to pass through Government lands nearby.	The District Collector, informed that the suggestions given by him will be considered. The alignment of main canals and distribution network has been finalized based on the disposition of command area these shall be serving.
22.	Potuganti Bharat Prasad, ZPTC	He expressed that, after going through EIA, EMP Booklets he suggested to get the awareness among Public. He has suggested to divert useful soils for farming and useless soils for reservoir purpose. He further suggested to recheck correctness of rate adopted to arrive land compensation which mentioned in EMP Booklets. Further, he informed that, due to the various Projects in the area greenery increased by 23%. He requested for including the disaster management plan for the Project.	The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report). Green belt shall be developed along canal roads and other areas for which Rs 2964 lakhs have been provided (Section 10.6 of EIA). The DMP has been provided in the report (Section-10.12).
23.	Sri. JaipalYadav, Hon'ble MLA	He briefed about the water allocation to the Telangana and AP by Bachawat Tribunal. He further	The project proponent thanked for the suggestions and informed that the suggestions given by him will be considered.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
		expressed that around 15 lakh people migrated from Mahbubnagar in search of livelihood and wished for the reverse migration of the public with the upcoming projects. In the year 2012-13 Shri. KiranKumar, Hon'ble, Chief Minister has sanctioned 7.5 Cr for Survey of this Project. In the 2014, Honble.PM during his visit to Telangana have assured the national status to PRLIS Project as Polavaram Project in AP.	

7.3.3 Public Hearing in Vikarabad District

The meeting was presided by the panel members namely Sri Pausumi Basu (IAS, Collector and District Magistrate Vikarabad District), Sri P. Suresh Babu (Environmental Engineer, Telangana State Pollution Control Board, Regional Office-I, Sangareddy); representatives of Irrigation & CAD Department, Government of Telangana and other officials namely Sri K. Srinivas (SE, Irrigation & CAD Department, Mahbubnagar), Sri S. Motilal (Additional District Collector and Additional District Magistrate, Vikarabad District), Sri K.V. Upender Reddy (RDO, Vikarabad District). The gist of issues raised and the replies of the project proponent in are described in **Table 7.3.**

Table 7.3: Issues Raised and Replies /Assurance of Project Proponent

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
1	Sri M Satti Reddy, SE(Retd.) Irrigation &CAD, Telengana.	He stated that due to construction of this project the Vikarabad District will be benefitted not only due to direct irrigation of lands but also due to increase in ground water levels. With surplus electricity available at present, the farmers of this area would be able to grow crops due to increased ground water availability. He opined that there would be no adverse impact on environment unlike chemical or other polluting industries.	The project proponent thanked the stakeholder for supporting the project. After introduction of irrigation facility, there shall be improvement in groundwater scenario due to recharge from seepage from reservoirs, canals and due to field application(699.83MCM).

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
2.	Sri B. Praveen Kumar Reddy, R/o. Chiguranpally	He supported the project whole heartedly. He sought justice to the land losers and requested the authorities to pay compensation three times to the market rate. Compensation was paid only to the land owners. He finally requested adequate compensation to the trees and other properties acquired before launching the project.	The project proponent thanked the stakeholder for supporting the project. The compensation shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
3.	Sri K. Aravind Rao, r/o. Rangapur	While extending his full support to the project, he hoped that the proposed project would provide irrigation water. He hoped that they would be able to grow two crops on completion of this project and also solve the ground water problem. He supported the proposed project.	The project proponent thanked the stakeholder for supporting the project. After introduction of irrigation facility, there shall be improvement in groundwater scenario due to recharge from seepage from reservoirs, canals and due to field application (699.83MCM)..
4.	Sri M Venkataiah, R/o. Parigi	He thanked the Government for proposing lift irrigation project. He informed that many acres of land will be cultivated. He further expressed his views with regard to land acquisition, he stated that there should not be any forced land acquisition. The officers shall follow the rules and give three times of market value under the compensation to the farmers who are losing their lands for the proposed project. He requested to complete the project in time.	The project proponent thanked the stakeholder for supporting the project. The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
5.	Sri Ziauddin Ahmed, SE (Retd), Kaleshwaram Project	He expressed that this Project is proposed to irrigate the lands in drought prone area. He further added that, due to this Project ground water will increase. After customary address to the chair and others, he felt that EIA process should be applied to the drugs and chemical factories, but not to the irrigation projects as there would be least disturbance to the environment and act as a supplement for enhancement of	The project proponent explained that for protection and improvement of environment in the country Environment (Protection)Act,1986, has been in place. After introduction of irrigation facility, there shall be improvement in groundwater scenario due to recharge from seepage

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
		environmental status. He stated that water would definitely enhance the status of environment.	from reservoirs, canals and due to field application (699.83MCM)..
6.	Sri Mukunda Nageshwar, R/o. Parigi	He felt happier and expressed his gratitude to the Government for taking a decision to extend water supply project to this area. He sought lifting of water from the Jurala project which was located at higher reaches instead Srisailam back water as there would be no dispute with any other state. He wanted land to land and house to house compensation to prevent any loss to the property losers in this project. He opined that solar panels should be erected on the canals passing through the farmer by transferring the benefit to the farmers from the power generated by such solar systems. He sought adequate compensation at least on par with the Kaleshwaram project to the losers of land.	The project proponent emphasized that the scheme envisages lifting, in five stages, of 90 TMC of flood water in 60 days during flood season from the fore shore of existing Srisailam project on Krishna River and has been framed after detailed survey and investigation. The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report). Due consideration for development of solar energy shall be made.
7.	Sri S. Sudhakar Reddy, R/o. Malkapoor	He suggested that water should be taken from Kobath village of Narmed Manda! to Chowdapur village from where water flows down to east naturally. He therefore requested to realign the canal to facilitate the coverage of more areas which were hitherto not supplied with water.	The project proponent informed Phase-I of project is meant for drinking water supply and phase-II for developing irrigation facility in the area. The alignment of main canals and distribution network has been finalized, with sole aim of bringing more area under CCA.
8.	Sri. N. Jagan, Rio. Ragbavpur Village	The present project will increase the ground water levels enormously, by using ground water another 3 lakh acres of land can be cultivated.	After introduction of irrigation facility, there shall be improvement in groundwater scenario due to recharge from seepage from reservoirs, canals and due to field application (699.83MCM).
9.	Smt. Satyaharichandra, MPP, Kulkacherla	She expressed her happiness for the proposed project. was depleted. Due to the proposed project the ground water will increases.	The project proponent thanked the stakeholder for supporting the project and informed the ground water table on the area

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
			shall improve after introduction of irrigation project. .
10.	Sri G. Srinivas, EE (Retired) (Kalwakurthy lift irrigation project, Koyalsagar and PRLIS)	He explained about the technical issues for not drawing water from Jurala Reservoir, the Jurala Reservoir is having 9 TMC capacity only. The PRLIS proposed to draw 90 TMC of water (1.5 TMC on every day) for 60 days. Hence, the Srisailam Reservoir is the better option as the capacity of the Srisailam Reservoir is 250 TMC. He expressed his happiness as everyone is supporting this project. The Vikarabad is very near to the Hyderabad, farmers can go for commercial crops like vegetables & fruits and their can increase their economy. He further informed that the ground water also increases and the farmers can also draw water from the borewells.	The project proponent thanked the stakeholder for supporting the project. The PP also endorsed his views about project being taken up from offshore of Srisailam reservoir and improving in groundwater scenario post project. .
11.	Sri K. Raji Reddy, Sarpanch, Doma	He requested the irrigation officials to change the design of the project in such a way that all the villages in their mandal shall be covered.	The PP informed that the alignment of main canals and distribution network has been finalized, with sole aim of bringing more area under CCA.
12.	Sri Kotla Yadagiri, R/o. Bomraspet Village	He welcomed the project and requested the irrigation officials to complete the project within time	The work of project, under Phase-II, shall commence after getting all statutory clearances. It is proposed to complete works in 30 months' time frame.
13.	Sri Mallesam, R/o. Kankal (V), Pudur Mandal	He requested the irrigation officials to complete the project within time.	The work of project, under Phase-II, shall commence after getting all statutory clearances. It is proposed to complete works in 30 months' time frame
14.	Sri Venkataramakrishna Reddy, R/o. Sayadpally	He welcomed the project and expressed their happiness and requested to complete the project within time.	The work of project, under Phase-II, shall commence after getting all statutory clearances. It is proposed to complete works in 30 months' time frame.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
15.	Sri Mohammed Jaffer, R/o. Sayadpally	He welcomed the project.	The project proponent thanked the stakeholder.
16.	Sri T. Venkatesh, R/o. Pargi, Member of Fisheries Society	He welcomed the project and very happy as they are going to get livelihood by increasing the fisheries. There are 300 families are depending on the fisheries in their village. All the families get benefitted from this project; thousands of acres land cultivated.	The project proponent thanked the stakeholder.
20.	Sri J. Shankar, Sanpanch, Dasamia Thanda, Kulkacberla Mandal	He welcomed the project	The project proponent thanked the stakeholder.
21.	Sri K.Hanumanth Mudiraj, DCC President, Pargi	He informed that the project is already become late and requested the Government to complete immediately. He requested the Government to compensate the losers by giving land to land, home to home and job to everyone. The compensation should as equal as market price.	The work of project, under Phase-II, shall commence after getting all statutory clearances. It is proposed to complete works in 30 months' time frame. The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
22.	Sri Ramdas Naik, R/o. Kulakacherla Mandal	He informed that they are waiting for many years to get this project.	The project proponent thanked the stakeholder.
23.	Sri V.Ravindra, R/o. Pargi	He welcomed the project.	The project proponent thanked the stakeholder.
24.	Sri. B.Ravi Kumar, R/o. Pargi	He extended his support for the project and informed the employment; industries will come up in this area.	The project proponent thanked the stakeholder for supporting the project. With coming of project, direct and indirect opportunities for employment shall open.
25.	Sri. Phir Mohammed, R/o. Narayanpur	He welcomed the project.	The project proponent thanked the stakeholder.
26.	Sri P.Anjalaiah, R/o Chellapur	He welcomed the project.	The project proponent thanked the stakeholder.
27.	Sri M.Rajender, R/o. Naskal	He expressed his happiness towards the proposed project. He requested the Government to concentrate on small check dams, rainwater harvesting pits which will increase the ground water and	After introduction of irrigation facility, there shall be improvement in groundwater scenario due to recharge from seepage from reservoirs, canals and

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
		local water bodies shall be filled with water.	due to field application (699.83MCM). As local area development emphasis shall be laid on development of harvesting structure/pond. In the command area.
28.	Sri M. Nagaraju, R/o. Mandipal, Kulkacherla	He extended his support for the project and requested to complete the project within time.	The work of project, under Phase-II, shall commence after getting all statutory clearances. It is proposed to complete works in 30 months' time frame.
29.	Sri S. Jangaiah, R/o. Kaalapur (V)	He expressed his happiness and informed that the farmers are happy with this proposed project. He requested the Government to give land to land, home to home to the farmers who will lose their lands instead of giving cash.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
30.	Sri Govind Naik, Rio. Dipsampally Thanda, Doma Mandal	He welcomed the project and requested the Government not to give permission for stone & sand mining activities.	The project proponent thanked the stakeholder. As regards sand and stone mining, it is governed under Telangana State Sand Mining Rules, 2015.
31.	Sri V. Manohar Reddy, DCCP Chair Person, Tirumalpur (V), Kulkacherla (M)	He formally welcomed the gathering for the proposed irrigation project public hearing. He highlighted the benefits of the projects like development of tourism, industries. Hence, everyone should support the project.	The project proponent thanked the stakeholder. .
32.	Sri K. Venkatram Reddy, R/o. Sultanpur (V)	He welcomed the project. Due to the proposed project some of the farmers will lose their lands and Government shall give compensation to them.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
33.	Sri E. Kondaiah, R/o. Salweed (V), Kulkacherla (M)	He requested the officials to cover all the villagers in Kulkacherla Mandal and shall complete the project within time.	The work of project, under Phase-II, shall commence after getting all statutory clearances. .
34.	Sri E.Raghavender Goud, Rio. Ghanapur (V), Kulkacherla (M)	He expressed happiness for the proposed project.	The project proponent thanked the stakeholder for supporting the project.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
35.	Sri T.Nagavardban, R/o. Rapole	He requested the Government to complete the project immediately as it is already too late. The Government should give compensation to farmers.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
36.	Sri S. Janardhan Reddy, Sarpanch	He extended his support for the proposed project	The project proponent thanked the stakeholder for supporting the project.
37.	Sri Parusuram Reddy, R/o. Sayedpally (V), Parigi (M)	He requested to give land to land, job to everyone and double room to families who are going to lose their lands as promised by our Hon'ble CM.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
38.	Srnt Haripriya, R/o. Pargi	She extended her support for the proposed project.	The project proponent thanked the stakeholder.
39.	Sri Annasaram Srisailam, R/o. Bandacherla (V)	He stated that the proposed project will draw 90 TMC of water, 1 TMC of water is sufficient for 10,000 Acres. Hence, the Government shall explore the possibility of drawing of additional 5 to 10 TMC water so that all the lands can be cultivated. He supported the project and very proud for this project.	The project proponent emphasized that the scheme envisages lifting, in five stages, of 90 TMC of flood water in 60 days during flood season from the fore shore of existing Srisailam project on Krishna River and has been framed after detailed survey and investigation.

7.3.4 Public Hearing in Rangareddy District

The meeting was presided by the panel members namely Sri Amoy Kumar (IAS District Collector and District Magistrate Rangareddy District), Sri M. Venkanna (TEnvironmental Engineer, T. S. Pollution Control Board, Regional Office-1, rangareddy Disrtict); representatives of Irrigation & CAD Department, Government of Telangana and other officials namely Sri A. Satyanarayana Reddy (SE, Irrigation & CAD Department, PRUS, Hyderabad), Sri G. Lakshmipathi Naidu (AGM, IP&D, M/s Voaynts Solutions Pvt. Ltd., Hyderabad). The gist of issues raised and the replies of the project proponent are described in **Table 7.4.**

At the outset, the Environmental Engineer, Regional Office, Ranga Reddy District, TSPCB, invited the people

Table 7.4: Issues Raised and Replies /Assurance of Project Proponent

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
1	Sri T. Khagendar, C.E.(Retd.)	This project would help not only the agriculture, but also other corn1ected sectors like fisheries, dairying etc. He therefore	The project proponent thanked the stakeholder for supporting the project.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
		requested the people to extend their support to the proposal.	
2.	Sri N. Patya Naik, Ex-MPTC, R/o Mityagunta Tanda,	He supported the proposed project.	The project proponent thanked the stakeholder
3.	Sri T. Dasaradh Naik, ZPTC, Kadthal	As the proposed project benefits 70,000 acres of land in this mandal, the people of this area comprising 222 tandas would be benefitted which would also obviate the problem of drinking water shortage faced by them earlier and the area would be prosperous like other areas.	The project proponent thanked the stakeholder for supporting the project.
4.	Sri Chanduji, R/ o. Kad thal	There would be no detrimental or adverse impact on industries, vegetation and cattle wealth due to this project. He also opined that there would be no adverse impact on surface or ground water including environment and ecology of this area and he hoped that necessary mitigation measures would be taken by the concerned authorities. He suggested grouting and canal lining to arrest erosion of soils and raising canal bank plantations. He opined that tourism & fisheries should be developed by preserving environment and ecology of the area. The socioeconomic condition of the people would be improved due to provision of water for two crops. He hoped that this project would enhance environmental conservation and preservation of biodiversity.	The project proponent thanked the stakeholder for supporting the project. The impact due to project have been identified and mentioned in the report and explained in the meeting. For mitigation of adverse impacts, various management plans as contained in the report shall be implemented (Section -10 of report). The socio-economic condition of people shall improve due to introduction of irrigation facilities and implementation of Local Area Development Plan.
5.	Sri Madhusudan Reddy, R/ o. Kadthal	He stated emphatically that environment would improve due to the proposed project and enhanced vegetative growth which would result in increased precipitation. He hoped that this project would be completed expeditiously within 2 years like Kaleshwaram project which took	The work of project, under Phase-II, shall commence after getting all statutory clearances. The project shall be completed within time frame of 30 months.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
		3.5 years for its completion.	
6.	Sri. S. Muthyam Reddy (SEE Retd. R&B, Telangana Retired Engineers Association)	He opined that there would be no adverse impact due to the proposed project and people would not object for this project.	The project proponent thanked the stakeholder for supporting the project.
7.	Sri. G. Lakshmi Narsimha Reddy, Sarpanch, Kad thal	Relevant Government orders were issued on 08.08.2013 for pumping the water from Srisailam foreshore to arrest migration of people. He complimented the engineers for construction of reservoirs thereby water would be made. available at the doorsteps of the villagers in 23 villages. Similarly, fisher folk would also be benefitted. Greenery will be developed in all these areas which would improve the environmental conditions.	The project proponent thanked the stakeholder for supporting the project.
8.	Sri J. Ananth Red dy, Vice MPP	He stated that the people of this area were hardworking. He hoped that government would speed up the implementation of the project for the benefit of the people.	The work of project, under Phase-II, shall commence after getting all statutory clearances. The project shall be completed within time frame of 30 months.
9.	Sri. Appam Srinu, Amangal	He thanked the government for sanctioning this project to benefit 60% of the area there would be no adverse effect on the environment and would not pose any problem. In fact, the ground water table would be improved and urged the government to speed up the pace of the project.	The work of project, under Phase-II, shall commence after getting all statutory clearances.
10.	Sri. D. Sat yanarayan a, Vice-Chariman PACS, Polepall y(V), Amangal (M)	He compared Kaleshwaram and PRLIS were started simultaneously but the former was commissioned and hoped this project would also be completed on war footing.	The work of project, under Phase-II, shall commence after getting all statutory clearances
11.	Sri. R. Tirupathi, Upasarpanch, Devuni Padkal (V)	He hoped that the dependence on borewells for irrigation and drinking water would come down after commissioning of this project.	After introduction of irrigation facility, there shall be improvement in groundwater scenario due to recharge from seepage from reservoirs, canals and due to field application

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
			(699.83MCM).
12.	Sri. K. Ramakrishna, Upasarpanch, Kadthal(V&M)	He supported the proposed project as it would ensure all round development of the area.	The project proponent thanked the stakeholder for supporting the project.
13.	Sri. B. Kumar, R/o Polepally, Amangal(M)	He complained that their Gram Panchayat was not benefitted and appealed to re align the canal through higher elevation to fill water into Voorasamudram and Settipally tanks. This step would also benefit Madgul mandal also.	The PP informed that the alignment of main canals and distribution network has been finalized, with sole aim of bringing more area under CCA. Nonetheless, the suggestions given by him will be considered, if feasible,
14.	Sri. Paramesh, District Rythu Member, Kadthal(M)	He appealed to the people to extend their support to the project, as this would benefit lakhs of people.	The project proponent thanked the stakeholder for supporting the project.
15.	Sri. Lachiram Nayak, R/ o. Vasudevapur, MPTC, Karkalpahad	He hoped that there would be year-round employment in their respective villages on completion of this project.	With coming of project, direct and indirect opportunities for employment shall open.
16.	J. Veeraiah, Rythu President, R/o. Kadthal	He extended his support to the project.	The project proponent thanked the stakeholder.
17.	Sri. Srinivas Yadav, R/ o. Talakondapally	While welcoming the project proposal, he stated that 21 villages of this mandal would be covered by this project. He hoped that this project would be completed within 2 years as was the case with Kaleshwaram Project which was completed within 3.5 years.	The work of project, under Phase-II, shall commence after getting all statutory clearances. The project has been planned to be completed within time frame of 30 months.
18.	Sri. G. Venkatesh, PACS Chairman, Kad thal(M)	He opined that there would be no adverse environmental impacts due to this project and fisherfolk would be benefitted. He concluded his views by comparing this irrigation project with Mining projects which would invariably cause environmental degradation.	The impact due to project have been identified and mentioned in the report and explained in the meeting. For mitigation of adverse impacts, various management plans as contained in the report shall be implemented (Section -10 of report). The socio-economic condition of people shall improve due to introduction of irrigation facilities and implementation of Local Area Development Plan.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
19.	Sri. Sudhakar Reddy, MPTC	After customary address he stated that there would be no objection to the proposed PRLIS.	The project proponent thanked the stakeholder for supporting the project.
20.	Sri. K. Shankar R/ o. Padkal(V)	He expressed his profound happiness over the supply of water to this area.	The project proponent thanked the stakeholder for supporting the project.
21.	Sri. Srinivas Reddy, R/ o Chikkapur	He requested the government to speed up the execution of this project.	The work of project, under Phase-II shall commence after getting all statutory clearances.
22.	Sri. J. Ramesh, MPTC, R/ o Padkal	He demanded employment in government for all those land losers. He appealed to the government to pay the compensation after considering the prevailing market rates to the lands.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report). Employment shall be given as per provision of Schedule-2 of the Act, However, with coming of project, direct and indirect opportunities for employment shall open.
23.	Sri. G. Yadagiri, R/o Talakondapally (V&M)	He extended his unequivocal support for project	The project proponent thanked the stakeholder.
24.	Sri. L. Mohan Reddy, R/o. Madhurapuram	He appealed to the government to expedite the execution of works on Laxmidevipally reservoir.	The work of project, under Phase-II, shall commence after getting all statutory clearances.
25.	Sri. Narayana R/ o. Aakuthotapally	He hoped that this project would help local people in providing year-round employment.	Employment shall be given as per provision of Schedule-2 of the Act, However, with coming of project, direct and indirect opportunities for employment shall open.
26.	Sri. Y. Narasimha R/ o. Makthamadharam	He stated that the canals would be useful to the farmers who were not able to secure year-round employment. He appealed to the government to render justice to the farmers who lost their lands under acquisition process. He sought Rs. 75 Lakhs per acre irrespective of registered value. People would feel happier if adequate compensation paid to them as per the provisions of latest L.A. act 2013.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report). Employment shall be given as per provision of Schedule-2 of the Act, However, with coming of project, direct and indirect opportunities for employment shall open

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
27.	Sri. D. Giri Yadav, R/ o Amangal(V)	He supported the project.	The project proponent thanked the stakeholder.
28.	Sri. B. Jagan Reddy, R/ o. Cheepununthala	He stated that there would be no objection from people for obtaining environmental clearance to this project.	The project proponent thanked the stakeholder for supporting the project. .
29.	Sri. Bala Krishnaiah, R/ o. Veljal(V)	He requested the government to speed up the work.	The work of project, under Phase-II, shall commence after getting all statutory clearances.
30.	Sri. K. Mallesh, R/ o. Devunipadkal(V)	He hoped to overcome the problem of scarcity of water on completion of PRLIS.	The project proponent thanked the stakeholder for supporting the project. .
31.	Sri.Ch. Ramesh, Sarpanch, Padkal(V)	He expressed his apprehensions over payment of compensation. He appealed to the government to render justice to the land oustees under the provisions of the latest L.A. act, 2013.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
32.	Sri. Mohanlal, R/o. Veljal(V)	He felt that there would be no damage to the environment on account of this project.	The impact due to project have been identified and mentioned in the report and explained in the meeting.
33.	Sri. Rahman, R/ o. Veljal(V)	He confided that there would be all round development in agriculture sector.	The project proponent thanked the stakeholder for supporting the project.
34.	Sri. K. Bheeshma Chary, Charikonda (V)	He sought adequate compensation to the land oustees. He extended his full support to the project proposal.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
35.	Sri. J. Krishna Gou d, R/ o. Devunipadkal(V)	He requested for speedy execution of the project.	The work of project, under Phase-II, shall commence after getting all statutory clearances.
36.	Sri. B. Kumar, R/o. Chandradhana(V), Talakondapally(M)	. He sought justice for payment of adequate compensations to the lands. He demanded payment of market rate as basis for calculating compensation. as was adopted in the case of Kaleshwaram project.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).

7.3.5 Public Hearing In Nalgonda District

The meeting was presided by the panel members namely Sri Prashant Patil (IAS Collector and District Magistrate Nalgonda District), Sri B. Rajendra (Environmental Engineer, T. S. Pollution Control Board, Regional Office, Nalgonda Disrtict); government officials namely Sri K. Gopi Ram (Revenue Divisional Officer, Devarakonda, Nalgonda District), Sri. T Ravindar (Assistant

Environmental Scientist, TSPCB, Regional Office, Nalgonda), Dr. S. Purushotham Reddy (Assistant Environmental Scientist, TSPCB, regional Office Nalgonda); representatives of Irrigation & CAD Department, Government of Telangana and other officials namely Sri M.A. Hameed Khan (Chief Engineer, Irrigation, Nagarkurnool), Sri GR. Ravinder (Executive Engineer, Irrogation Division No.3, Nagarkurnool), Sri. R. Satyanarayana (Dy. Executive Engineer, Irrigation, Sub-Division No.1, Nagarkurnool), Dr. Ashish Rawat (Consultant, M/s Voyants Solutions Private Limited, Gurgaon). The gist of issues raised and the replies of the project proponent are described in **Table 7.5.**

Table 7.5: Issues Raised and Replies /Assurance of Project Proponent

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
1	Sri Vinjamuri Ravi, R/o. Varkala	The Government has taken very good project of PRLIS to improve the lives of people and thanked the government for this project, to provide water for drinking and irrigation.	The project proponent thanked the stakeholder for supporting the project.
2.	Sri N. Giridhar, R/o. Chinthapally	While welcoming the project requested the authorities to get Environmental Clearance for the PRLIS project early and complete the project.	The work of project, under Phase-II, shall commence after getting all statutory clearances.
3.	Sri G. Srinivas, Sarpanch, Nelvelapally	He supported the project.	The project proponent thanked the stakeholder.
4.	Sri Vinj amuri Krishnaiah, R/ o. Varkala	While welcoming the project he has thanked the Government for taking up the project. He sought employment and good compensation to the land losers.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
5.	Sri Md. Chand Pasha, R/o. Kurmed	He stated that it is proud to the people of Chinthapally Manda! to get this project. He urged that compensation to the land losers may be given as per market rates.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
6.	Sri P. Yadaiah, R/ o. Kurmapally	He supported the project.	The project proponent thanked the stakeholder.
7.	Sri Mallaiah, R/ o. Chakaliseripa lly	He supported the project.	The project proponent thanked the stakeholder.
8.	Sri D. Chandra Shekhar Reddy, R/o. Kistarampally (V), Chinthapally Mandal	He supported the project.	The project proponent thanked the stakeholder.
9.	Sri Y. Chenna Keshav a Reddy, Social Activist	He welcomed the project as it is very useful to the people. He sought suitable compensation to the land losers and also permanent or temporary jobs may be provided to the land losers. Small contracts may also be given to the local	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report). Employment shall be given as per provision of

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
		people. The water taken from Srisailam project will help in fisheries development also and requested the authorities to issue Environmental Clearance at the earliest.	Schedule-2 of the Act, However, with coming of project, direct and indirect opportunities for employment shall open.
10.	Dr. B. Ramana Naik, Chairman, Institute of Engineering - Telangana State	He stated that it is fortunate to have this project to this area. He expected that the R&R Plan should be properly implemented.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report). The PP assured that the R&R plan shall be implemented properly under the aegis of the Resettlement & Rehabilitation Committee constituted for this purpose.
11.	Sri P. Krishnaiah, R/o, Ramnagar, Chinthapally	He welcomed the project.	The project proponent thanked the stakeholder.
12.	Sri T. Hussain Naidu, NGO	He extended his fullest support to this irrigation project. He requested the authorities to take up plantation 5 time more for the plants removed during Canal Construction. He requested the authorities to provide good compensation to the land losers. He supported the project.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
13.	Sri Jeedimetla Ravinder, Environmental Activist, Nalgonda	He whole heartedly welcomed the project. on behalf of their NGO organization, they are recommending to MoEF&CC to accord Environmental Clearance to the project at the earliest. This project will also help the state government's Haritha Haram plantation Programme.	The project proponent thanked the stakeholder for supporting the project.
14.	Sri Palla Narasimha Reddy, Ex. MPP, Devarakonda and CPI Party	He supported the project on behalf of his party. He requested to implement R&R package and complete the project at the earliest. He supported the project.	The PP assured that the R&R plan shall be implemented properly. The work of project, under Phase-II, shall commence after getting all statutory clearances.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
15.	Sri Jitta Jagadish, R/o. Godukondla (V), Chinthapally Mandal	He welcomed the irrigation project and thanked the Government.	The project proponent thanked the stakeholder for supporting the project.
16.	Sri Masa Bhaskar, R/o. Godukondla (V), Chinthapally Mandal	He supported the project and sought to implement the suggestions made by the public. Suitable Compensation may be given to the land losers.	The compensation for land and other assets shall be as per provisions of RFCTLARRA 2013 (Section 10.5.1 of report).
17.	Sri Kankanala Venkat Reddy, TRS Leader	He expected this project is completed at the earliest and requested the authorities to issue Environmental Clearance.	The work of project, under Phase-II, shall commence after getting all statutory clearances.
18.	Sri Ramesh Naik, Palem Thanda	He welcomed the project	The project proponent thanked the stakeholder.
19.	Sri Puli Raju, R/o. Godukondla (V), Chinthapally Mandal	He supported the project.	The project proponent thanked the stakeholder.
20.	Sri Balagoni Jangaiah Goud, R/o. Chakali Seripally (V), Chinthapally Mandal	He has supported the irrigation project.	The project proponent thanked the stakeholder for supporting the project.
21.	Sri Andek ar Ashok, R/o. Kurmed (V), Chinthapally Mandal	He supported the project.	The project proponent thanked the stakeholder.
22.	Sri Arekanti Maisaiah	He thanked all for conducting the Public Hearing. He requested to pay suitable compensation to the land losers in the project.	The work of project, under Phase-II, shall commence after getting all statutory clearances.
23.	Sri Arekanti Chandraiah, R/o. Vinjamur	He welcomed the irrigation project.	The project proponent thanked the stakeholder.

7.3.6 Public Hearing in Narayanpet District

The meeting was presided by the panel members namely Smt. Hari Chandana Dasari (IAS, District Collector and Magistrate Narayanpet District), Sri Kumar Pathak (Environmental Engineer, T. S. Pollution Control Board, Head Office, Hyderabad); officials namely Sri K. Chandra Reddy (Additional Collector (LB), Narayanpet District), Sri. K. Siddiramappa (CEO, Zila Parishad, Narayanpet Distirct), Sri N. Shivadharmateja (SE, Irrigation & CAD Department, IC3, Makthal), Sri R. Dayanand (Executive Engineer, Irrigation & CAD Department, Division-I, Mahabubnagar), Dr. Arvind Dubey (Environmental Consultant, M/s. Voyants Solutions Private Limited, Gurgaon). The gist of issues raised and the replies of the project proponent are described in **Table 7.6.**

Table 7.6: Issues Raised and Replies /Assurance of Project Proponent

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
1	Sri K. Ramakrishna, Koilkonda	He welcomed the proposed irrigation project.	The project proponent thanked the stakeholder.
2.	Sri Srinivas Reddy, Narayanpet	We will cooperate in implementing the project	The project proponent thanked the stakeholder
3.	Sri Vittal Rao, Re td. Engineerof Irrigation Department	All shall support the project as the project will bring development in the area.	The project proponent thanked the stakeholder for supporting the project.
4.	Sri K. Bheem Reddy, Dhamargiddha (V&M)	He requested to complete the project urgently so as to stop migration of people from the district.	The work of project, under Phase-II, shall commence after getting all statutory clearances.
5.	Sri Rajender Goud, Marikal (M)	Stated that the proposed project is a long-time dream of the people and there is no environmental impact of the project. He requested for early completion of the project.	The work of project, under Phase-II, shall commence after getting all statutory clearances.
6.	Sri S.P. Reddy, General Secretary, Retd.Engineers Association	He informed that the project was earlier proposed in 2010 but could not be materialized. The Phase-I of the project for drinking water is already started. The proposed project will irrigate 1.6 lakhs acres of land in Narayanpet district. He suggested the Irrigation department to explore water distribution through pipeline network instead of canals.	The Project Proponent informed that about 49,798 ha area is proposed to be brought under pressurized irrigation.
7.	Sri Damodar Reddy, Vithalapur	He requested for early completion of the project and they will support in land acquisition.	The work of project, under Phase-II, shall commence after getting all statutory clearances.
8.	Sri Venkataiah, Maddhur	He welcomed the project and requested to provide additional reservoir at Kanukurthi.	The project proponent thanked the stakeholder for supporting the project.
9.	Sri Venkat Reddy, Kanukurthi	invited the project and stated that they will cooperate fully to develop the area. The water distribution should be efficient. There are no environmental objections from them for the proposed project.	The project proponent thanked the stakeholder for supporting the project.
10.	Sri Bandi Shivarami Reddy, Narayanpet	He stated that there are no environmental issues due to the proposed project. There is considerable fishermen community in the area and hence facility	The District Collector, Mahbubnagar has thanked for the suggestions and informed that the suggestions given by him

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
		should be provided for fisheries development in the area. The cattle may be provided for development of Women Associations.	will be considered.
11.	Sri Athma Ram, Retd. Engineer	He extended full support for the project.	The project proponent thanked the stakeholder.
12.	Sri Sai Reddy, Kollampally	He requested to complete the project as early as possible and provide irrigation water so that migration of people can be stopped.	The work of project, under Phase-II, shall commence after getting all statutory clearances.
13.	Sri Madhavulu, Koyakonda	He stated that their community will fully support the proposed project as it benefits the area.	The project proponent thanked the stakeholder for supporting the project.
14.	Sri Pada Kulkarni, Narayanpet	He requested that the PRILS project may be completed in time so that surface water and groundwater will be increased.	The work of project, under Phase-II, shall commence after getting all statutory clearances.
15.	Sri Sathya Reddy, Gharlapadu (V)	He stated that they will fully support the project.	The project proponent thanked the stakeholder.
16.	Sri Bhurlapadu Ravi Kumar, Abhangapur	He stated that there are no environmental impact of the project and requested for early completion of the project.	The work of project, under Phase-II, shall commence after getting all statutory clearances. .
17.	Sri Sambaiah, Retd. Chief Engineer, Irrigation dept	He informed that he earlier worked in Godavari and Krishna delta area and the proposed project will result in development of the area and there will not be any negative environmental impact of the project.	The project proponent thanked the stakeholder for supporting the project.
18.	Sri Sanjeevaiah, Parpally	He stated that they do not have any objection and do not envisage negative environmental impact of the project.	The project proponent thanked the stakeholder for supporting the project.
19.	Sri Gouri Satish Kumar, Manikonda	He stated that they offer total support for the proposed project.	The project proponent thanked the stakeholder.
20.	Sri G. Shiva Kumar, Dhanwada	He stated that they offer total support for the proposed project. The project will be very useful if completed in time-bound manner.	The work of project, under Phase-II, shall commence after getting all statutory clearances. The project is likely to be completed in 30 months timeframe.
21.	Sri Sai Kumar, Narayanpet	He informed that the proposed project envisages to lift water from longer distance. The same may be done from Krishna River which is at 40 km from Narayanpet.	The project proponent emphasized that the scheme envisages lifting, in five stages, of 90 TMC of flood water in 60 days

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
			during flood season from the fore shore of existing Srisailam project on Krishna River and has been framed after detailed survey and investigation.
22.	Sri Venkataiah, Thirumalapur	Stated that all the 31 communities from their area fully support the proposed project.	The project proponent thanked the stakeholders.
23.	Sri Eatappa, Dhamargiddha	Stated that they will give full support to the project as the project will help in development of fisheries, agriculture and traditional local occupations.	The project proponent thanked the stakeholder for supporting the project.
24.	Sri B Ramulu Shernapally	Mentioned that 21 villages of their mandal are covered under the project. They offer total support for the proposed project and requested for early completion of the project.	The work of project, under Phase-II, shall commence after getting all statutory clearances. The project is likely to be completed in 30 months timeframe.
25.	M Ramulu Kotakonda	He stated that water is lifted from longer distance in the proposed project. The same may be done from Krishna River which is at 40 km from Narayanpet. He requested to provide lift irrigation facility for Pedda Cheruvu located in their village. There is no objection from environmental angle of the project.	The project proponent emphasized that the scheme envisages lifting, in five stages, of 90 TMC of flood water in 60 days during flood season from the fore shore of existing Srisailam project on Krishna River and has been framed after detailed survey and investigation.
26.	Sri V. Chakravarthy, Ramanapally Thanda	He stated that they fully support the proposed project.	The project proponent thanked the stakeholder for supporting the project.
27.	Sri Kishan Rao, Dhamargiddha	He stated that they fully support the proposed project.	The project proponent thanked the stakeholder.
28.	Smt. Bandi Rajeshwari, Narayanpet	She stated that there is no objection to any environmental impact of the project and that they fully support the proposed project.	The project proponent thanked the stakeholder for supporting the project.
29.	Sri Thirupathaiah, Marikal	He stated that greenery will be increased due to proposed project. It will help shepherd community for grazing their sheep & goats and will result in their development.	The project proponent thanked the stakeholder for supporting the project.
30.	Sri G. Ashanna, Dhamargiddha	He stated that 16 villages of their mandal are covered under the project. The project must come to stop migration of people from their	The project proponent thanked the stakeholder for supporting the project.

S.N.	Name of stake-holder	Brief details	Replies/Assurance of Project Proponent
		area.	
31.	Sri K. Hanumanth, Ealigandla	He requested to avoid land acquisition from small and marginal farmers. He stated that the land acquisition should be done in transparent manner from large farmers. They will fully support the project.	The Project Proponent categorically stated that Land Acquisition shall be carried out in transparent manner within the framework of RFCTLARRA 2013 (Section 10.5.1 of report).
32.	Sri Rajyavardhan Reddy, Zinnaram	He stated that their area is dry with very low rainfall and there is migration of people. He requested that the project may be discussed with the MLAs and try to complete the project as soon as possible. They will fully support the project.	The work of project, under Phase-II, shall commence after getting all statutory clearances. The project is likely to be completed in 30 months timeframe.
33.	Sri Nagaraju, Narayanpet	We fully support the project	The project proponent thanked the stakeholder
34.	Sri Rajesh, Narayanpet	They will fully support the project. They do not expect negative environmental impact of the project.	The project proponent thanked the stakeholder for supporting the project.
35.	K. Chandrasekhar, Dhanwada	He stated that only 9 villages of their mandal are covered by the project. He requested that the remaining villages may also be covered in the project. He requested to provide lift irrigation for Gandi Cheruvu, as it will provide more water for agriculture in their area.	The PP informed that his request shall be considered.
36.	Sri Hanmi Reddy, Marikal	He stated that they will offer total support for the project.	The project proponent thanked the stakeholder for supporting the project.

7.4 RISK ASSESSMENT

The project activities involve certain types of hazards, during construction and operation, which can disrupt normal activities abruptly and lead to disaster like fires, failure of machinery, explosion, to name a few. The impending dangers or risks, which need be investigated addressed, disaster management plan formulated with an aim to taking precautionary steps to avert disaster and to take such action after the disaster, which limits the damage to the minimum. Following problem may be encountered during construction at the project site.

- Accidents due to explosives/blasting
- Failure of stripped slope.
- Accidents due to HEMM
- Sabotage in case of magazine

In order to take care of above hazards/disasters, the following safety measures will be strictly complied with in the current project:

- Handling of explosives, charging and blasting shall be carried out by competent persons only.
- Provision of magazine at a safe place with proper fencing and necessary watch and ward. Adequate safety equipment will be provided at magazine and project site.
- Regular maintenance and testing of all project equipment/machinery and transport vehicles as per manufacturers guidelines
- Entry of unauthorized persons will be prohibited.
- Firefighting and first –aid provisions in the project office/complex and project area and ensuring periodic checking of worthiness of firefighting and first aid provision.
- Training and refresher courses for all the employees working in hazardous points. All employees shall have to undergo the training at a regular interval.
- As a part of disaster management plan, a rescue team will be formed by imparting specialized training to select project staff.

7.5 POSSIBLE HAZARDS

There are various factors which singularly and severally can cause disaster in irrigation project. The project activity is associated with many hazards which are discussed in the following sub sections:

7.6 BLASTING

The accidents from the blasting are mainly manifest as projectiles which some time traverse beyond the danger zone and trespass the project boundary. It is largely due to overcharging of blast holes and also during secondary blasting. During initial and final blasting operations flying rocks are encountered. Ground Vibration caused due to blasting lead to displacement of adjoining areas and result in fallout of loose rock-mass if not properly scaled in earlier blasting cycle. The following measures are suggested to avoid accidents due to blasting:

- All blasting operations shall be supervised by a competent person appointed for the purpose and strictly conducted as per guidelines contained
- Danger zone area falling within a radius of 500m from the blast site shall be demarcated;
- Guards shall be posted at all access points leading to the blast area to prevent and control movement of persons/ stray animal;
- All employees and equipment shall be cleared off the blast area to a safe location prior to any scheduled blasting; and
- Audible signals such as sirens whistles and mikes etc., shall be put to use to caution the workers, passer-by about the scheduled blasting events.

7.7 HEAVY MACHINERY

Most of accidents during transport of dumpers, excavators, dozers and other transport vehicles are often attributed to mechanical failures and human errors and can be significantly averted by adapting to following:

- All HEMM and transport vehicle movement within the project area should be carried out under the direct supervision and control of the management;
- All project machinery and vehicles should be periodically maintained and weekly checked by a competent person authorized by the management;
- Conspicuous sign board should be provided at each and every bend for guidance of the operators/drivers during day/night time; and
- To avoid dangers while reversing the trackless vehicles, especially at the embankment and tripping points, all areas for reversing of vehicles should, as far as possible, be made man free, and should be a light and sound device to indicate reversing of trucks/project machinery.

7.8 STORAGE OF EXPLOSIVE

The explosive magazine shall be located outside the project area. For the purpose of transportation of explosives, explosive van shall be deployed. The main hazard associated with the storage, transport and handling of explosives is fire and explosion. The rules as per Indian Explosive Act-1983 and Explosive Rules-2008 should be followed for handling of explosives, which includes transportation, storage and use of explosives.

7.9 FUEL STORAGE

All project machinery will operate on diesel for which no storage point is envisaged in the project area. It will be stored in the central workshop area of the proponent.

7.10 DISASTER MANAGEMENT PLAN DURING CONSTRUCTION

In order to handle disaster/emergency situations, an organizational chart entrusting responsibility to various project personnel will be prepared with their specific roles during emergency.

7.11 PLANNING

Identification and Prevention of Possible Emergency Situations

Possible emergency situations can broadly be classified into vehicle collision, and inundation off project area. Some of the ways of preventing emergencies are as follows:

- Preparation of a Preventive Maintenance Schedule Programme and also covering maintenance schedules for all project machinery/equipment and instruments as well as transport vehicles as per recommendations of the manufacturer's user manuals
- Ensuring the compliance of traffic rules strictly along Kuccha roads (haul roads) within the project lease area as well as outside the project lease area.
- Emergent situation arises due to happening of some incident culminating into an abnormal situation. It implies that sufficient time space running from a few seconds to few minutes is always invariably available to arrest an incident of abnormal situation from turning in to an emergency.

7.12 IMPLEMENTATION

Following key personnel, identified for carrying out specific and assigned duties in case of any kind of emergency, shall be available on call on holidays and off duty also.

- Project Manager
- Personnel Officer
- Foreman
- Essential workers

7.13 RESPONSIBILITIES OF PROJECT MANAGER

- To take overall charge at the place of incident and activate the Emergency Preparedness Plan according to severity of situation.
- Inform doctor to be ready for treatment of affected employees and intimate their relatives.
- To depute staff, carry out following functions -
- To liaison with district administration and other departments and guide their personnel
- To supervise assembly and evacuation at all points
- To look after patients who are bed ridden and any casualties and give psychological support
- Inform and liaison with project proponent, Police department and District Emergency Authority.
- Arrange for chronological records of emergency to be maintained.
- Issue authorized statements to news media.

7.14 RESPONSIBILITIES OF PROJECTS FOREMAN

- To take immediate charge at the site of incident and ensure that immediate steps as per Emergency Preparedness Plan are taken and immediately inform Project's manager.
- Shall disseminate the information regarding emergency by blowing of siren / hooter.
- Supervise assembly and evacuation as per plan, if required and ensure that casualties are receiving proper medical care.
- Ensure accounting for personnel and rescue of missing persons.
- Control traffic movement in project area.

7.15 RESPONSIBILITIES OF TRAINED WORKERS

A task force comprising of specially trained staff to act and deliver in the emergency situation shall carry out the following work.

- Fire-fighting and spill control till fire brigade takes the charge and thereafter assist the fire brigade
- Ensuring safety and isolating equipment, materials, urgent repairing or replacement, electrical work etc.
- Controlling movement of equipment, transport vehicles, special vehicle at the project site.
- Extending first - aid and medical help.
- Assistance at casualty's reception areas to record details of casualties.

CHAPTER 8 PROJECT BENEFITS

There will be number of positive changes on the socio-economic conditions of the people in the surrounding area. There will be obvious change in the scenario leading into the Socio-economic development of the area.

- Increased Irrigation Potential
- Better Living Standards
- Improved Market Facilities
- Employment Potential
- Tourism / Recreation Facilities
- Sustained Water Availability for Agriculture, Industrialization, Drinking and Cattle rearing.
- Increased Green cover
- Improvement in Ground Water Level
- Increase in Health Care Facilities
- Improvement in Life Style, Status and Confidence-building
- Economic upliftment due to Draw Down Cultivation
- Command Area Development
- Solution of the problem of migration
- Conservation of Forest and fuel
- Social Forestry

8.1 INCREASED IRRIGATION POTENTIAL

At present the area sown during Kharif and Rabi crops in command area is 3,56,945ha and 44,660 ha. The crop intensity in the command during kharif and Rabi are71.68% and 8.97%% respectively. The irrigation facilities will increase the production of food grains, which in turn will improve the economic condition of the people in the adjoining areas. At present the maximum dependability is on the rain water for agriculture operations and the construction of the project will give immense opportunities for better and increased irrigation facilities resulting into better yield and varieties of the crops. At present the crop intensity during Rabi is only 8.97% which will be increased to 15.64% after implementation of the project. Based on the existing cropping pattern and for boosting the production during Rabi the area to be brought under Kharif and Rabi irrigation shall be 4,95,835 ha (99.57%) and 77,887 ha (15.64%) respectively. The annual intensity has been assessed as 115.20% of the CCA. After implementation of project the annual yield of crop shall increase from existing35,55,050 quintals to 4,05,66,422 quintals. The net income from produce in pre-project scenario has been assessed as Rs 71,820.55 lakh which shall be Rs 11,74,507.62 lakh in post project scenario. In addition to gross value of produce income is also expected from dung receipts at the rate of 30 per cent of the cost of fodder. After making the above indicated provisions the net value of produce is assessed to be Rs. 53,731.66 lakh before project and Rs. 1,01,582.26 lakh after the irrigation under the project. Thus, the net incremental income due to the project in agriculture sector is assessed to be Rs. 9,57,850.60 lakh.

8.2 BETTER LIVING STANDARD

When the dependability of rain will diminish for agriculture and other needs after the construction of the Project people will have more agriculture production by increased yield as well as by bringing more area under cultivation, which in turn will improve their economic condition resulting into better standard of living. The people will start using the new techniques of agriculture and will have better irrigation facilities. Due to this there will be increase in income of the farmers of command area. Because of economic upliftment there will be reduction in poverty in that area.

8.3 IMPROVED MARKET FACILITIES

Due to creation of Ayacut roads in command area the transportation facilities will be improved which in turn shall render market facility available to the farmers by which they can take their produce to the places where they can get better and improved market rates for their produce. At present, there are no weekly markets in the adjoining areas, therefore people are not able to take their produce to the weekly markets and middlemen take away the profit which should be accrued to the local farmers. With a view to facilitate the farmer to directly sale his agriculture an animal husbandry product, without intervention of the middleman, it is proposed to develop150 marketing amenities in the form of sheds (18mx6m) covered with GC sheets resting on iron trusses. It is proposed to construct total length of 740 km single lane bituminous pavement road as Ayacut roads

8.4 EMPLOYMENT POTENTIAL / FISHERIES

The project will provide adequate employment opportunity during construction as well as after the completion of the project when the benefits will start accruing. About 13500 local people are likely to be engaged as un-skilled/semi-skilled/skilled labour in construction activities. Besides this due to implementation of labour-oriented works under Green Belt Development Plan and Command Area Development Plan a large number of local people are likely to be engaged.

The creation of the reservoir will increase the fish production and development of pisciculture in the region. Many families will get job in the fisheries which will improve their socio-economic condition. Considering productivity of reservoir fisheries with effective management practice as 275 kg/ha and with average net return from fish production as Rs. 85 /kg, the total annual revenue from fisheries shall be Rs.1,113 lakh.

8.5 TOURISM/RECREATION FACILITIES

Due to formation of reservoir, the project will result in increase of tourist recreation facilities generating the opportunities of self-employment to the local population.

8.6 SUSTAINED WATER AVAILABILITY FOR DRINKING, AGRICULTURE ETC.

Up till now majority of the farmers of command area villages were depending upon rain water for agriculture and other needs but after the construction of the project there will be sustained water availability to the tune of 82.52TMC for irrigation of Kharif and Rabi crops in the command area.

It is envisaged that domestic drinking water to the extent of 7.15 TMC or 202.47 MCM will be supplied to enroute villages in the command area. The rate approved for this supply of drinking water is Rs. 5.07/ m^3. The revenue generated, at the above indicated rate, from drinking water supply is estimated to be Rs. 102.63 crore. Similarly, the Industrial water supply to the extent of 0.33 TMC or 9.34 M cum will generate the income to the extent of Rs. 13.61 crore at the approved rate of Rs. 14.57/cum.

8.7 INCREASED GREEN COVER

When the irrigation facilities will increase there will be sustained water availability in the area, the green cover will certainly increase. At present the land in the adjoining area has greenery which will increase manifolds in future. There will be improvement in the area of grazing land due to the increase irrigation facilities. Due to which cattle rearing can become a source of livelihood. Under the Green Belt Development Plan, it is proposed to plant 1522392 saplings along both banks of main canal, service roads of distribution network and project colonies. The implementation of all these plans shall increase the vegetal cover in the area.

8.8 IMPROVEMENT IN GROUND WATER LEVEL

Ground water recharge from implementation and operation of PRLIS system shall be due to seepage from reservoir, losses from canal system and field application. The total recharge due to project shall be 1291.02 MCM, which has been summed up in **Table 4.4**. Accounting for unavoidable natural discharge (10%), the net ground water recharge shall be 1161.92 MCM. The rise in water table shall be minimum for Nalgonda district (0.03m/yr) and maximum for Mahbubnagar district (0.65m/yr. Therefore, necessary water management strategies, such as conjunctive use of surface and groundwater are necessary in these areas.

8.9 IMPROVEMENT IN LIFESTYLE, SOCIAL STATUS AND CONFIDENCE BUILDING

When there will be economic growth due to availability of more job opportunities in the area there will be improvement in lifestyle and social status of the people. The social status of the people can change only when there is economic growth in the society. The construction of the project will bring many positive changes resulting in the development of the area. This will give immense confidence to the people to achieve better prospects in life which is certainly going to increase their social status.

8.10 COMMAND AREA DEVELOPMENT

A plan for Command Area Development has been prepared in consultation with project proponent. The command area can be developed by providing field channel system in the area giving assured irrigation facilities for exploring the possibilities of better economic prospects for the present and future generations of these villages.

8.11 SOLUTION OF THE PROBLEM OF MIGRATION

There is a major problem of migration in the affected villages as well as benefitted villages. Due to shortage of water in the area and possession of small land holdings and fewer yields of the crop people have to migrate out of their village to earn a livelihood for the family. The analysis of the study reveals that the intensity of migration is there in the affected village as well as in the benefitted villages.

The forthcoming project will open many avenues for the livelihood in the affected village and for the people living in benefitted villages. The agricultural yield will increase once irrigation facilities will be there. The cattle rearing will also be possible if there will be sufficient water. There will be more job opportunities once tourism and recreation activities develop here. If ample opportunities are available in the village itself then they don't have to leave the village and migrate to other cities for earning their livelihood.

8.12 CONSERVATION OF FOREST AND FUEL

After the relocation of the affected population, they will be living near some town where they will have the availability of cooking gas and other means of fuel so there will be saving of fuel wood resulting into conservation of forests when people will not cut the forest for fuelwood for cooking purposes. After getting the compensation of houses people will be constructing concrete houses so there will be saving of timbre.

8.13 SOCIAL FORESTRY

Social Forestry will be possible only when sources of water are available. The availability of irrigation facilities and increase of water table in the area will give ample opportunities to do the Social Forestry for making the environment pollution free. It is required that Govt. should make extra efforts to build awareness amongst the common people of the district about the possible advantages and benefits by resorting to social forestry.

8.14 PROJECT BENEFIT- COST RATIO

In order to examine the economic viability of the scheme the benefit cost ratio has been worked out based on the guidelines given in the Working Group Report 'Guidelines for preparation of detailed project reports of irrigation and multi-purpose projects provided by Ministry of Water Resource, Government of India. The expected value of produce without and with the introduction of irrigation is worked out. The gross value of the benefits of the project for the pre-project and post project conditions are computed adopting the yields and prices of

commodities collected from Agricultural and marketing departments. The benefit cost analysis of the project as per guidelines of the Central Water Commission has been worked out and found to be 1.26:1 @ 10% interest rates. The detailed analysis is provided in **Table 8.1.** The internal rate of return for the project has been computed without considering distributional and employment effect and the same works out to 12.94%. Based on the above rate of return (12.94%) arrived is discounted to get net present value (NPV) and the B C Ratio has been worked out. The Ratio stands at 1:26.

Table 8.1 : Analysis of Benefit Cost Ratio of Project

S.N.	Particulars	Before Irrigation	After Irrigation
A.	**GROSS RECIEPTS**		
1	Gross Value of the farm produce	1,67,647.40	13,52,951.36
2	Dung Receipts @ 30% of the fodder expenditure	7,544.13	60,882.81
3	Total (A): Gross Receipts (1+2)	**1,75,191.53**	14,13,834.18
B.	**EXPENSES**		
1	Expenditure on Seeds	6,529.31	10,844.65
2	Expenditure on Manure	64,279.13	85,054.53
3	Expenditure on Pesticides		
4	Expenditure on Hired Labour	21,480.75	28,303.48
5	Fodder expenses @ 15%/10% of Gross value of farm produce	25,147.11	1,35,295.14
6	Depreciation on implements @ 2.7% of Gross value of farm produce	4,526.48	36,529.69
7	Share & Cash rent @ 5%/3% of total gross value of farm produce	8,382.37	40,588.54
8	Land revenue @ 2% of total gross value of farm produce	3,352.95	27,059.03
9	Total (B): Expenses (1 to 8)	**1,33,698.10**	**3,63,675.06**
C.	**NET VALUE of PRODUCE**		
1	Total Gross Receipts	1,75,191.53	14,13,834.18
2	Minus total expenses	1,33,698.10	3,63,675.06
3	NET VALUE of PRODUCE	**41,493.43**	**10,50,159.12**
D.	**ANNUAL BENEFITS**		
1	Net value after irrigation	10,50,159.12	
2	Net value before irrigation	41,493.43	
3	Net annual benefits	10,08,665.69	
4	Revenue from Domestic water supply (7.15 TMC) i.e. 202.47 M cum @ 90 Lakhs per M cum.	18,221.89	
5	Revenue from Industrial water supply (0.33 TMC) i.e. 9.34 M cum. @ 840 Lakhs per M cum.	7,849.43	
6	Fisheries (including Lease revenue of Fishing rights @ Rs1000 per ha per annum)	1,160.15	
7	Tourism	112.00	
	Total (D)	**10,36,009.16**	
E.	**ANNUAL COSTS**		
1	Interest on Capital @ 10% of estimated total cost of the project including cost of land development	5,50,866.00	
2	Depreciation of the project @ 1 % on project cost minus	42,963.00	

S.N.	Particulars	Before Irrigation	After Irrigation
	Pumping systems		
3	Annual operation and maintenance charges for CCA of 4,97,976 ha @ Rs 1000/ha	4,980.00	
4	Maintenance of Head works @ 1% of the cost of Head works Rs 20,940.35 Cr	20,940.35	
5	Depreciation of the pumping system Assumed life of 16 years. i.e., 6.25% per year on Rs 12,123.46 crores	75,772.00	
6	Power charges for lift irrigation (4305 million Units @ Rs 3.00/Unit)	1,29,150.00	
7	Total (E)	**8,24,671.35**	
	BENEFIT COST RATIO (D/E)	**1.26:1**	

CHAPTER 9 ENVIRONMENTAL COST BENEFIT ANALYSIS

After having gone through the various aspects of the project at the proposed site and the related documents like Form–I and PFR, the MoEF while setting out the scoping clearance and had not recommended any study on Environmental cost benefit analysis.

CHAPTER 10ENVIRONMENTAL MANAGEMENT PLAN

10.1 CATCHMENT AREA TREATMENT PLAN

10.1.1 General

As per Forest Guidelines and Clarifications (Handbook of FC Act,1980 and subsequent amendments, the Catchment Area Treatment Plan are required to be formulated in case of proposal for diversion of forest land for major /medium Irrigation projects and large Hydro-electric projects (> 10 MW). However, in respect of small hydel projects (maximum up to 10 MW capacity), which are either canal head or run-of the river projects without involving impounding of water/submergence of forest land, catchment area treatment plan will not be insisted. Thus, the guiding factor for necessitating a catchment area treatment plan is creation of submergence by impounding water and diversion of forest land with or without coming under submergence.

10.1.2 Requirement of Cat Plan Under Phase I

As regards Phase-I works, diversion of 205.48 ha of forest land in Achampet Division of Nagarkurnool District for works of Lift-I Pumphouse, formation of Anjanagiri Reservoir, tunnel in between Anjanagiri reservoir at Narlapurand Veerajanya Reservoir at Yedula was involved for which Stage-I and Stage-II Clearances have been accorded by MoEF&CC vide F.N.8-43/2017-FC, dated 3.4.2018 and vide F.N.8-43/2017-FC, dated 25.1.2019 respectively. As per condition at S.N. xx of Stage-I approval letter, the CAT Plan shall be implemented by the State Forest Department from the funds provided by the User Agency. In the present case on demand raised, the User Agency had deposited Rs.2,48,66039 towards cost of CAT Plan.

10.1.3 Requirement of Cat Plan Under Phase II

In the absence of creation of any new submergence of forest area, catchment area treatment plan is not warranted under Phase-II works, which merely entail construction of main canal and distribution system. Since under phase -II works neither diversion of forest land is involved nor new submergence of main off taking point from the existing Srisailam reservoir is involved, there shall be no requirement of catchment area treatment plan.

10.1.4 Cost of Cat Plan Under Phase I &II

Phase wise cost of CAT Plan is provided in **Table 10.1.**

Table 10.1: Cost of CAT Plan

Phase	Particular	Cost (Rs lakh)
I	Cost of CAT Plan deposited to the State Forest Department as per condition at S.N. xx of Stage-I approval letter v F.N.8-43/2017-FC, dated 3.4.2018.	2.49
II	Cost of CAT Plan	0.000
Total Phase I &II		2.49

10.2 COMMAND AREA DEVELOPMENT PLAN

10.2.1 General

The Command Area Development and Water Management (CAD&WM) Programme must be implemented in a holistic manner *pari-passu* with irrigation project so that irrigation potential created (IPC) with hydraulic connectivity gets utilized soon after its creation, improvement in water use efficiency, increase in agricultural productivity and production and to bring sustainability in the irrigated agriculture in a participatory environment. The main objective is reducing the gap between irrigation potential created and that utilized. The programme aims at enhancing agricultural production and productivity in irrigated commands by judicious and equitable distribution of the available irrigation water with active involvement of farmers through participatory irrigation management (PIM).

10.2.2 Overview of Project

The Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) scheme in its first phase envisages lifting of 90 TMC of flood water in 60 days during flood season from the fore shore of Srisailam project on Krishna River at Yellur (V), Kollapur(M) in Mahabubnagar (D) through five separate stages, ending at Padmaram. (V), Chowdergudem (M), near Shadnagar town at the highest elevation. These five stages comprise of a reservoir and conduit between each reservoir for taking water forward with pumphouses being constructed where necessary. In Phase-II, the I&CAD proposes to use this stored water to irrigate upland areas of Mahabubnagar, Narayanpet, Rangareddy, Nalgonda, Nagarkarnool and Vikarabad districts with a command area of 4,97,976 Ha (12.30 lakh acres).

10.2.2.1 Topography of command area

The majority of the project command is spread over five districts of the state of Telangana located in Southern peninsular India. The topography of the proposed command areas of the project is mostly undulating and is characterized by ridges and valleys. However, some places in the proposed command areas have plane topography. The general slopes of the land are from West to East and South East. Isolated hills and hill ranges are also present in the command areas of the project. The average elevation in the command area of the project is over 522 meters above Mean Sea Level (MSL).

The predominant slope categories viz. 0-1% and 1-3% i.e., nearly level accounted for over 93.14% of the gross command area of the project with about 8,83,945 ha of gross command area. The soil slope may not be a constraint in planning cropping pattern since more than 97.49 per cent of gross command area is within moderately soil sloping categories. The land in the soil slope categories of above 3% may impose certain constraints in planning of cropping pattern in the command area. However, these categories of land slopes account for only 3.44 % of total gross command area with 30,432 ha of land in these categories of land slopes. Land sloping categories of very gently sloping i.e., 0-1% and 1-3% is the predominant soil slope category in case of gross command of all main canals. The nearly level land accounted maximum of the total gross command area of all main canals. The distribution of gross command area according to

land slope may not impose any constraint on crop planning and irrigation scheduling in case of gross command of all main canals except for Kurumurthyraya High Level Canal command and Hanwada canal command. The command area of these two main canals may require additional treatment in terms of land shaping and land levelling. The geographical distribution of gross command area of all 13 main canals across the different soil slope categories.

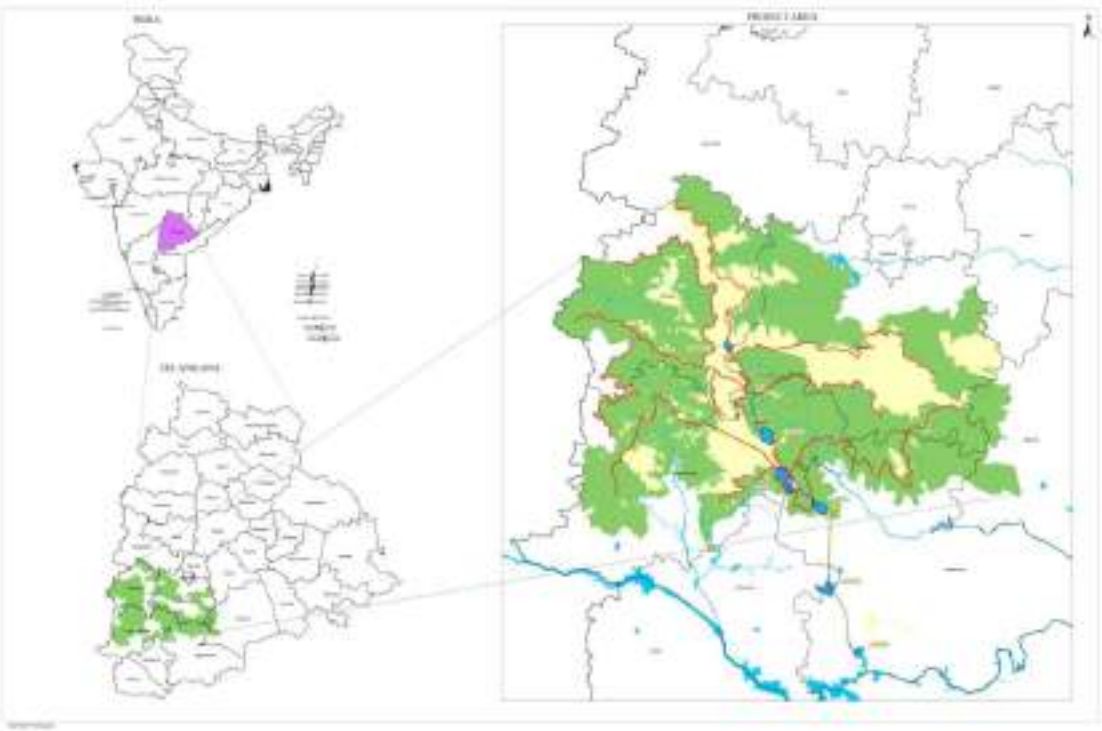


Figure 10.1: Index Map of Project Showing Command Area

The slope area under different slope classes is tabulated in **Table 10.2. and** slope map is shown in **Figure 10.2 and** the drainage map is shown in **Figure 10.3.**

Table 10.2: Slope classes in Command Area

Sr. No	Slope Range	GCA (ha)	Area (%)
1	0 – 1	785,792	88.90
2	1 – 3	37,449	4.24
3	3 – 5	10,314	1.17
4	5 - 10	11,602	1.31
5	10 - 15	5,169	0.58
6	15 - 35	3,347	0.38
7	>35	0	0.00
8	Water Bodies	30,272	3.42
Total		**8,83,945**	**100.00**

10.2.2.2 Drainage of command area

The entire command area lies in the Krishna Basin. The drainage of the command area of PRLIS is dendritic to sub-dendritic. Musi and Kagna rivers, which are the main tributaries of River

Krishna, originate from and drain the command area of the project. PeddaVagu, ChinnaVagu and PochammaVagu are the minor tributaries of River Krishna drain the command area of PRLIS. The proposed command area is having dense network of drainage lines. The red sandy loamy soils are the dominant soil types in the command area of the proposed command area of the project with higher infiltration rates. The slope range of 1-3% is the predominant slope category in the command area. The land with this slope is having gentle flow. The drainage map of command area is shown in **Figure 10.3.**

The command area, length of drains and drainage density of twelve main canals of the project are presented in **Table 10.3**. The total length of drains in the gross command area of the project is estimated to be 15,649.02 km. Command area of KPL North Main Canal accounted for maximum (18.2%) of the total length of drains in the project command with 2,846.33 km and is followed by the command of Madduru Canal with drain length of 2,805.26 km (17.90%). The lowest GCA of 88.76 sq km and length of drains of 151.10 km was observed in the command of Udandapur 1R-Main Canal.

Figure 10.2: Slope Map of Command Area

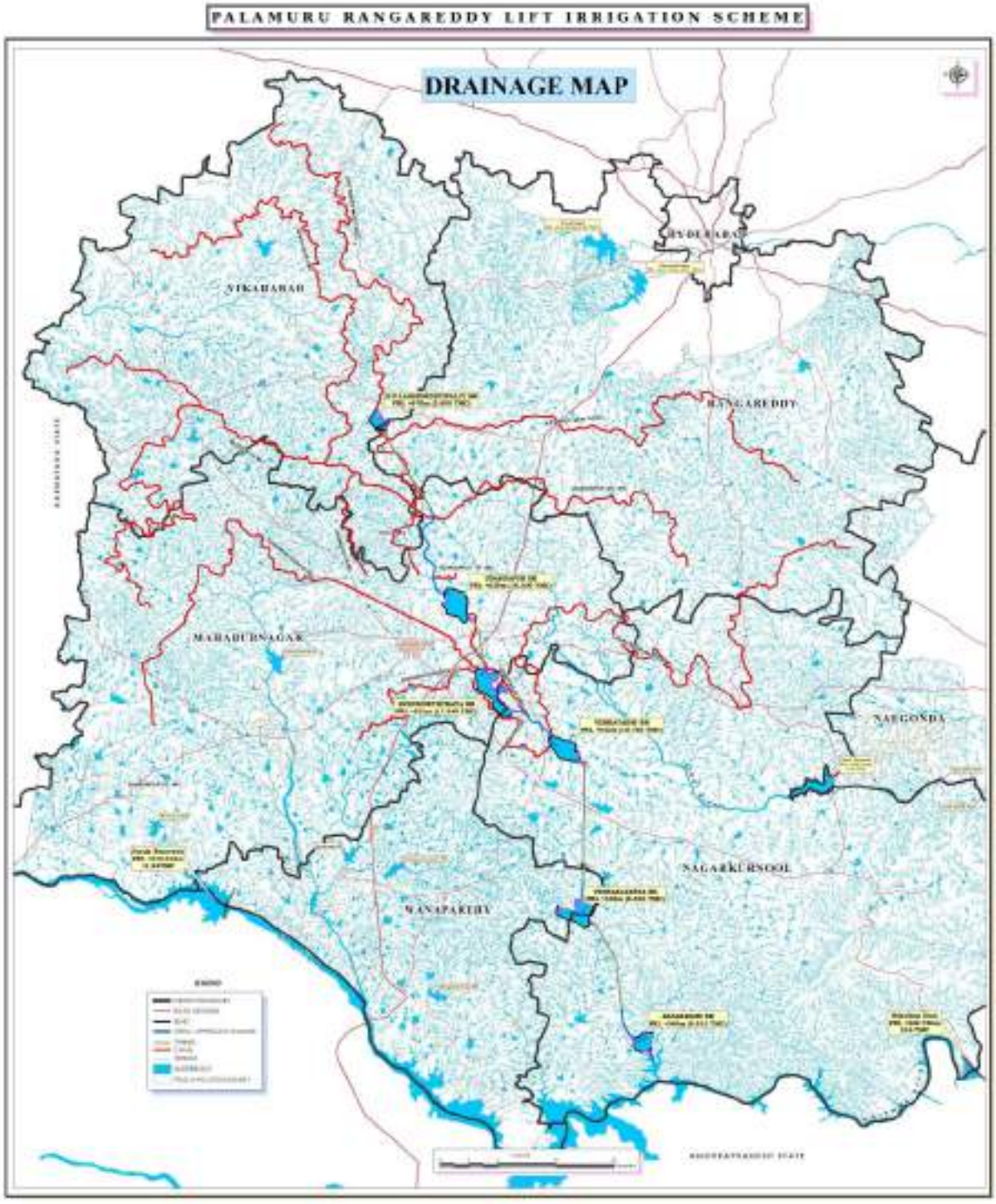


Figure 10.3: Drainage Map of Command Area

Table 10.3: Drainage Density of PRLIS Gross Command Area

SN	Reservoir	Canal Name	GCA (sq km)	Length of drains (in km)	Drainage density (km per sq km)
1	KPL	KPL East Main Canal	1,272.07	2,226.13	1.75
2		KPL North Main Canal	1,355.39	2,846.33	2.10
3		KPL South Main Canal	192.26	321.08	1.67
4	Kurumurthiraya	Kurumurthyraya High Level Canal	1,166.34	2,111.08	1.81
5		Kurumurthyraya Left Low Level Canal	218.74	454.98	2.08
6	Udandapur	Hanwada Canal	215.73	491.87	2.28
7		Madduru Canal	1,275.12	2,805.26	2.20
8		Udandapur 1R-Main Canal	88.76	151.10	1.70
9		Udandapur 2R-Main Canal	1,024.95	1,939.91	1.89
10		Udandapur Left Main Canal	963.83	1,652.98	1.72
11		Udandapur South Main Canal	244.86	462.83	1.89
12	Venkatadri	Venkatadri Low Level Canal	105.98	185.46	1.75
13		Venkatadri Main Canal	715.41	1,395.05	1.95
Total			**8,839.45**	**15,649.02**	**1.77**

10.2.2.3 Land Use Pattern of the Gross Command Area

The dominating classes are, agricultural land Kharif cropped area accounted for maximum 3,39,562 ha (38.41% of the gross command area) followed by agricultural land double cropped area and agricultural fallow lands and agriculture land Rabi/summer cropped with 2,16,735 ha (24.52%) 1,47,959 ha (16.74%) and 33,728 ha (3.82%) respectively. The agricultural land including current fallows accounted for about 84.01 per cent of total gross command area with 7,43,250 ha of land in this category. on the other hand, the non-agricultural land accounted for less than 16 percent of the total gross command area. The land use pattern of command area is enumerated in **Table 10.4** and its disposition in **Figure 10.4.**

Table 10.4: Land use of Gross Command Area (ha)

S. No.	Land use category	Area (ha)	Area (%)
1	Agricultural Land-Crop Land-Cropped in 2 seasons	2,16,735	24.52
2	Agricultural Land- Kharif Crop	3,39,562	38.41
3	Agricultural Land- Rabi/ summer Crop	33,728	3.82
4	Agricultural Land-Fallow	1,47,959	16.74
5	Agricultural Land-Plantation	5,266	0.60
6	Built Up Land	21,193	2.40
7	Forest-Deciduous	14,758	1.67
8	Forest-Scrub	21,083	2.39
9	Tree clad Areas- dense/closed	5,511	0.62
10	Salt affected waste land	4,209	0.48
11	Waste Lands	43,671	4.94
12	Water bodies-Reservoir/Tanks	30,270	3.41
Total		**8,83,945**	**100.00**

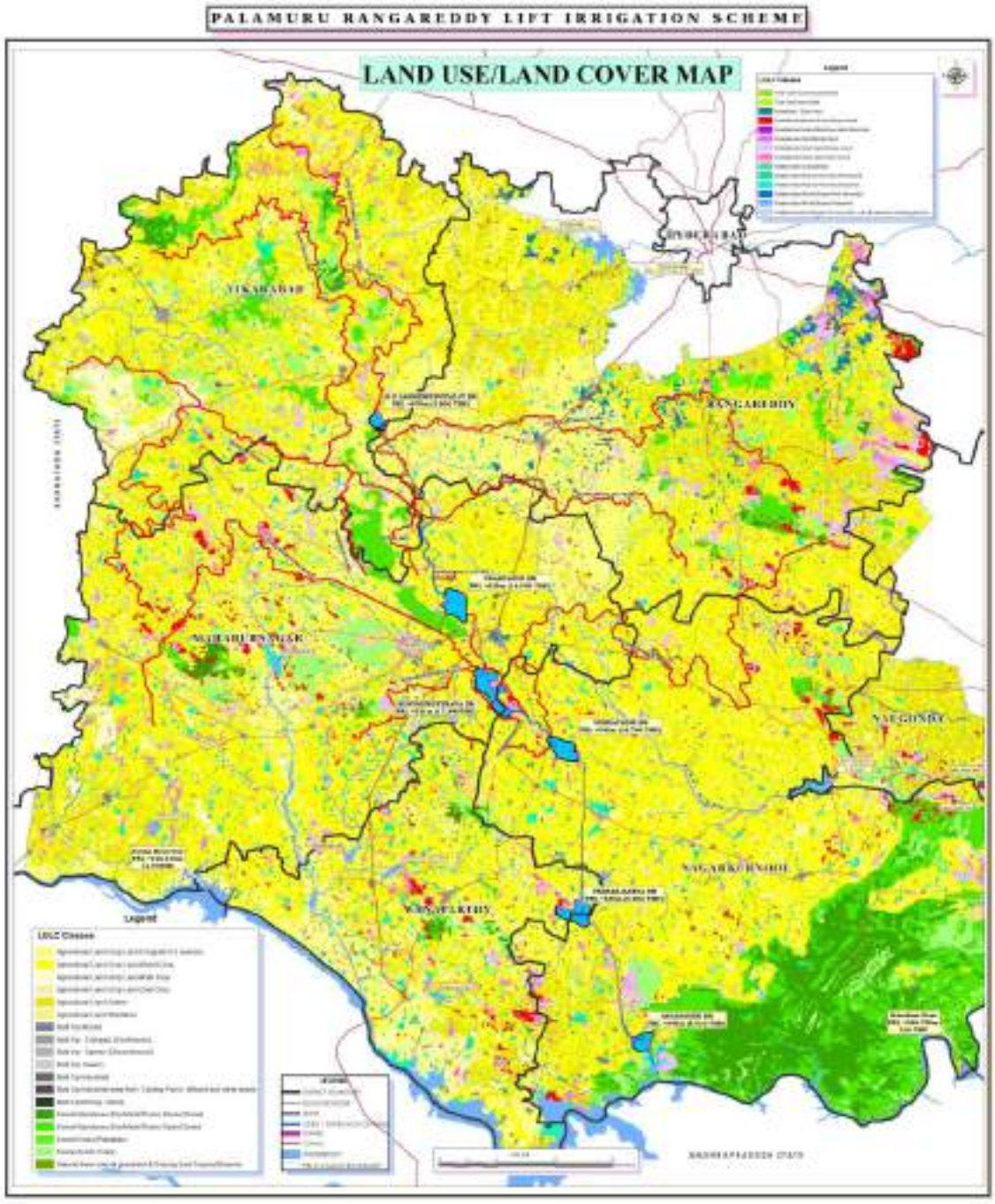


Figure 10.4: Land use Map of Command Area

10.2.2.4 Climate of the Command Area

Climate is the principal aspect of the physical environment affecting agriculture. The characteristics of the soil - the essential medium for plant growth, are largely the product of present and past climates and the vegetation that has flourished in them, and the effects of relief are to no small degree expressed through resulting climatic variation (Symons, 1978, 33). It consists of the elements like rainfall, temperature, length of growing session, sunlight, frost, fog conditions, hailstorms and winds. All these elements of weather have direct and indirect influence on the cropping pattern of a region (Hussain, 1986, 23). Consequently, the expression of agriculture, the cultivable area, thespatial and temporal cropping pattern and above all

strategy of farm economy and its ecology depend on climatic conditions

The command area is located in semi-arid region and has predominantly hot and dry climate. Summer starts in March and high temperature is observed in May with average temperature of 42^{0}C. Monsoon starts in the month of June and lasts until September. The region experiences a hot and dry summer throughout the year except during the South West Monsoon season. The year may broadly be divided into four seasons. It experiences cold season from December to Mid-February, summer season from Mid-February to first week of June. South West monsoon season from June to September and retreating monsoon or the post monsoon season during October to November.

10.2.2.5 Temperature, Rainfall and Relative Humidity of the Command Area

Themean maximum temperature for Nalgonda is 44.9^{0}C while mean minimum temperature is 15.4^{0}C. The mean maximum temperature for Mahbubnagar is 42.9^{0}C while mean minimum temperature is 13.2^{0}C. The mean maximum temperature for Hyderabad is 42.7^{0}C while mean minimum temperature of 10.6^{0}C.

Month of June, July, August and September mainly contributes the rainfall. In Nalgonda, the total annual rainfall was recorded ad 750.7 mm (1981-2010), maximum monthly rainfall was recorded as 148.4 mm which occurred in September, and minimum monthly rainfall was 5.3 mm which has been recorded in February. In Mahbubnagar, the total annual rainfall was recorded as 770.8 mm, maximum monthly rainfall was recorded as 306.6 mm which occurred in August, and minimum monthly rainfall is 3.7 mm which occurs in December. In Hyderabad, the total annual rainfall was recorded as 770.8 mm, maximum monthly rainfall was recorded as 306.6 mm which occurred in August, and minimum monthly rainfall is 3.7 mm which occurs in December. There are about 37 rainy days in a year for Nalgonda, 50 rainy days for Mahbubnagar district and about 40 rainy days are recorded in Hyderabad.

In case of Nalgonda, during the monsoon season, relative humidity generally varies between 70% to 77% in the morning and 50% to 57% in the afternoon. The air becomes dry after the withdrawal of the southwest monsoon. The driest part of the year is the summer season when in the afternoon's relative humidity becomes as low as 36% which has been found in the month of May. In Mahbubnagar, the relative humidity found in a range of 73% and 83% in monsoon and becomes lowest in the month of April i.e., 32%. In Hyderabad, during the monsoon season, relative humidity generally varies between 70% to 82% in the morning and 51% to 69% in the afternoon. The air has lost its humidity in the summer season when in the afternoon's relative humidity becomes as low as 30% which has been found in the month of May.

10.2.2.6 Soil of the Command Area

10.2.2.6.1 Soil Texture

The main functions of the soils, from agricultural point of view, are to give mechanical support to plants and store and supply the required nutrients and water for plant growth. These functions of the soil depend on its physical, chemical and biological characteristics. Among physical properties texture and structure are very important which determine such characteristics of soil as water absorbing and retentive capacity and movement of air and water.

Chemical and biological properties determine its fertility status. Soils covering the forests and hilly tracks and stony areas are infertile. The soils of the forest and hills are generally shallow and contain quartzite, basalt and sandstone boulders which are of little use. The soils of command area are predominantly occupied by red soils with gravelly clay-loam to gravelly clay soils. About eight different types of surface textured soils are identified in the total gross command area of the project as is revealed from **Table 10.5** and its distribution over command is depicted in **Figure 10.5.**

Table 10.5: Surface Texture of soils in the Command Area

S No	Soil Texture	GCA, ha	% of GCA
1	Gravelly Loam	419,568	47.47
2	Clay	264,166	29.88
3	Gravelly Clay	70,797	8.01
4	Cracking Clay	48,249	5.46
5	Loam	21,768	2.46
6	Loam (Calcareous)	21,566	2.44
7	Gravelly sandy loam	7,552	0.85
8	Clay (Calcareous)	7	0.00
9	Water Bodies	30,272	3.42
Total		**8,83,945**	**100.00**

10.2.2.6.2 Soil Depth

Soil depth is an important parameter for determining the crops to be grown in a given area. There are large variations in the soil depth of command area of the project. The total gross command area of the project had been classified in to six categories depending upon the soil depth **(Table 10.6). At** the aggregate level three categories of soil depths viz. moderately deep soil depth (50.44%), moderately shallow soil depth (16.77%) and Shallow soil depth (13.68%) accounted for over 80.89 per cent of total gross command area of the project with 714986 ha in these three categories of soil depth. These areas can support any type of cropping in the command area of the project. Three other soil depth categories viz. Very Shallow, Very Deep and Deep accounted for less than 15.68 per cent each of the total gross command area of the project. About 883945 ha of the gross command area accounting for over 93.54 per cent of the total gross command area of the project is in the soil depth category between Very Shallow and Moderately deep. This clearly indicates that the soil depth may not be a constraint in crop planning for the command area. The geographical distribution of gross command area of different main canals across various soil depth categories are presented in **Figure 10.6.**

Table 10.6: Depth of soils in the Command Area

S No	Soil Depth	GCA, ha	%
1	Deep	26,819	3.03
2	Moderately deep	445,866	50.44
3	Moderately Shallow	148,229	16.77
4	Shallow	120,891	13.68
5	Very Deep	54,116	6.12
6	Very Shallow	57,752	6.53
7	Water Bodies	30,272	3.42
Total		**8,83,945**	**100.00**

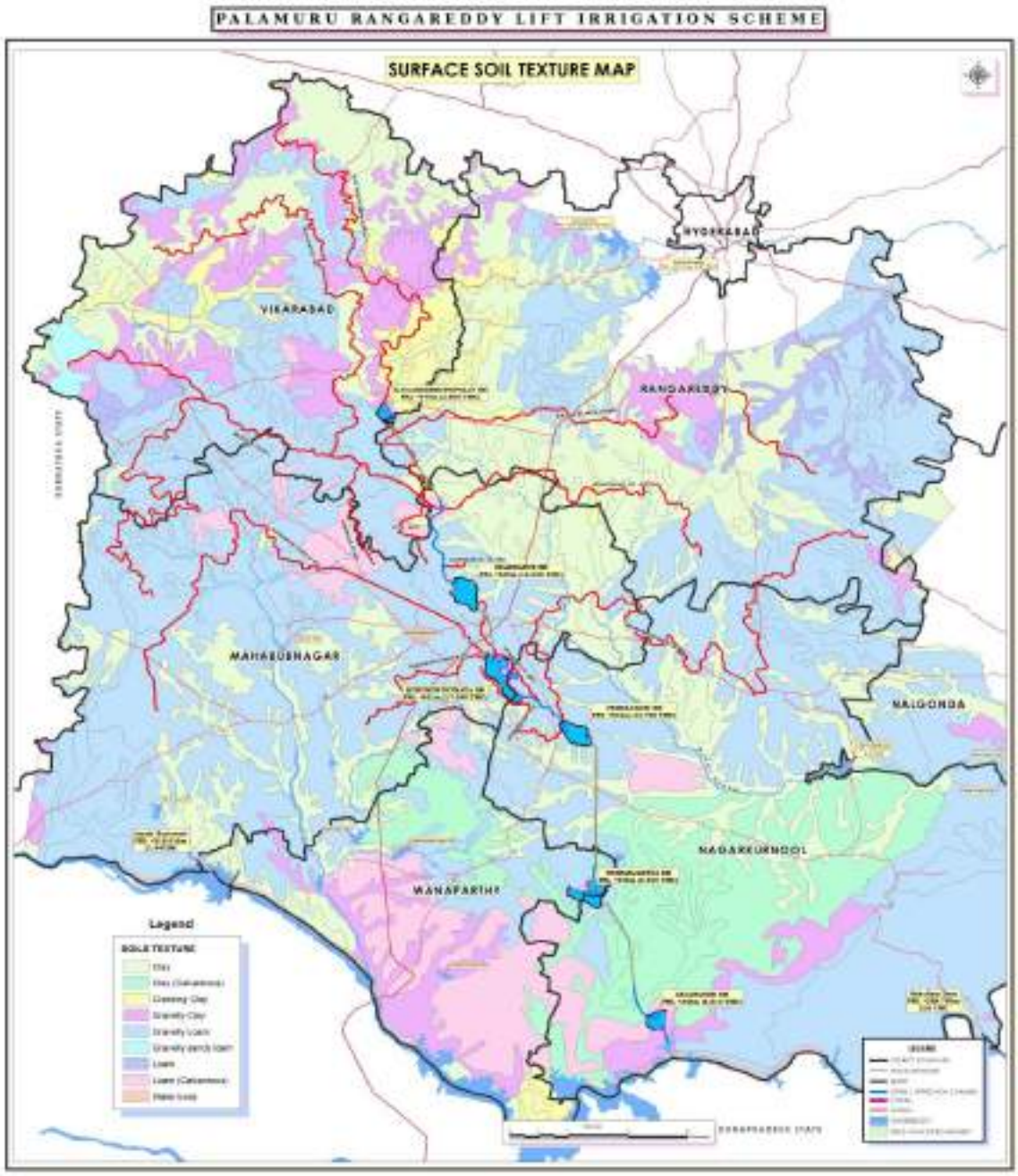


Figure 10.5: Soil Texture Map of Command Area

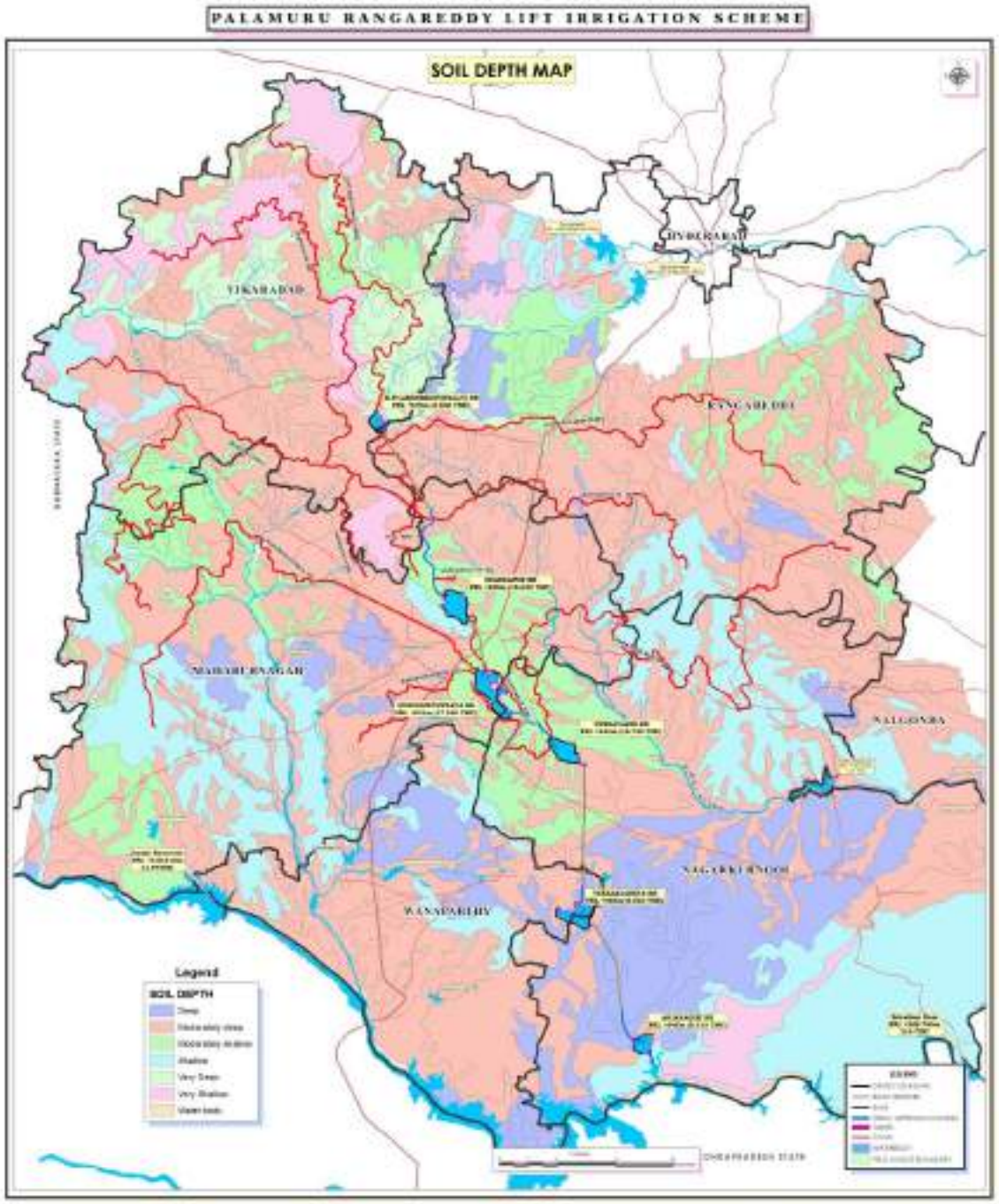


Figure 10.6: Soil Depth Map of Command Area

10.2.2.7 Soil salinity of the Command Area

As per the estimates of CADP the extent of waste lands that are salt affected in the GCA is estimated to be 5,173 ha and these lands account for 0.54% of total GCA of the project. Majority (65.23%) of this land is in Mahbubnagar district with 3,374 ha and the share of these lands in GCA of the district is 1.06%. The district wise distribution of these lands is presented in the **Table 10.7**.

Table 10.7: Soil Salinity in the Command Area

District	GCA, ha	Wastelands-Salt affected land	%
Mahabubnagar	297,905	3,357	1.13%
Nagarkurnool	69,839	209	0.30%
Nalgonda	20,827	319	1.53%
Rangareddy	242,358	288	0.12%
Vikarabad	253,015	36	0.01%
Total	**883,945**	**4,209**	**0.48%**

10.2.2.8 Land capability class of Soil of the Command Area

Land use capability classification indicates the suitability of various kinds of soil for economic uses, mainly agriculture. The guiding principles for this classification are the limitations imposed on the sustained use of soils by the basic characteristics of soils in combination with climate, topography," surface drainage, vegetation cover, erodibility and other natural hazards. There are eight land capability classes which are indicated by Roman numbers I to VIII. Land suitable for cultivation accounted for 84.43 % of total gross command area with 746315 ha in this category of land whereas land not suitable for cultivation accounted for just 15.57 % (which includes water bodies also) of total gross command of the project. Broad class wise gross command area, but not including sub classes, is given in **Table 10.8.**

Table 10.8: Distribution of Gross Command Area as per Land Capability classes

Sl. No.	Land Capability Class		Description	GCA, ha	%
1	Land suited for cultivation	I	Lands have slight/few or no limitations and are suitable for sustainable intensive cultivation for a variety of crops	-	0.00
2		II	Good cultivable lands having minor problems of soil texture, drainage and erosion.	202,016	22.85
3		III	Moderately good cultivable lands having moderate erosion, slope, drainage and soil problems.	418,922	47.39
4		IV	Fairly good cultivable lands having severe erosion, drainage, climate and soil problems.	125,377	14.18
	Sub total			**7,46,315**	**84.43**
5	Land not suited for cultivation	V	Lands that have allcharacteristics of class I lands except for locally severe limitations of stoniness, rockiness or extremes of climatic conditions	-	0.00
6		VI	Land well suited for grazing and forestry, having severe erosion, topography and soil problems.	48,089	5.44
7		VII	Non-arable lands suited for grazing and forestry.	12,919	1.46
8		VIII	Lands suitable only for wildlife, recreation and quarrying.	46,350	5.24
	Sub total			**107,358**	**12.15**
Miscellaneous			Water Bodies	30,272	3.42
Total				**883,945**	**100.00**

10.2.2.9 Land Irrigability of Soil of the Command Area

Guidelines for evaluation of soil properties relevant to irrigation are contained in IS:10317-1982 (reaffirmed 2009) and criteria for determining the land irrigability classes has been made eloquent in Appendix A, which takes into various aspects like topography, drainage, sub surface, depth to ground water table. The land irrigability class indicates the general capability of land for irrigation use in its present state. Land classes are based upon the rating and assessment of soil and topographic features that affect the suitability of land for irrigation. The limitations or hazards become progressively greater from Class 1 to Class 6. Land in Class 1 to Class 4 is suitable for irrigation. Class 5R is temporarily irrigable, undergoing reclamation. Class 5 is a non-irrigable provisional class. Class 6 identifies the non-irrigable land. The land irrigability of soil in the command area is shown in **Table 10.9.**

Table 10.9: Land Irrigability Class of Command Area

S No	Land Irrigability Class	Description	GCA (ha)	%
1	2ds	Lands with moderate drainage and soils limitation	6,055	0.68
2	2s	Lands with moderate soils limitation	147,410	16.68
3	2s-3st	Lands with moderate soils limitation and moderately severe soil and topography limitations	11,756	1.33
4	2s-4s	Lands with moderate to severe soils limitation	2,347	0.27
5	3ds	Lands with severe drainage and soils limitation	262,591	29.71
6	3s-4st	Lands with severe to very severe soils and topographic limitation	96,300	10.89
7	3st	Lands with severe soils and topographic limitation	113,139	12.80
8	4ds	Lands with very severe drainage and soils limitation	46,281	5.24
9	4s-2ds	Lands with very severe to moderate drainage and soils limitation	67,431	7.63
10	4st	Lands with very severe soils and topographic limitation	17,275	1.95
11	4st-2s	Lands with moderate soils limitation and severe topographic limitation	5,535	0.63
12	6st	Lands not suitable for soils and topographic limitation	27,213	3.08
13	6st-R	Lands not suitable to rock land	3,966	0.45
14	R-6st	Rock land to Lands not suitable to soils and topographic limitation	46,374	5.25
15	Water bodies		30,272	3.42
Total			**883,945**	**100.00**

10.2.3 Existing and Proposed Cropping Pattern In The Command Area

Based on the DPR Paddy, maize, jowar, green gram, black gram, red gram, cotton and castor are the main crops grown in Kharif season whereas paddy, maize, sorghum, groundnut, bengal gram, sunflower and safflower are the main rabi crops in the command area of PRLIS. The gross cropped area in the command area of the project is assessed to be 4,01,606 ha and same accounted for 80.6% of the CCA. The net cropped area in the command area of the project is

356945 ha and cropping intensity without considering current fallows and waste land in the CCA is estimated to be 112.5% The existing cropping pattern has been shown in **Table 10.10.**

Table 10.10: Existing Cropping Pattern in Command Area

S.N.	Kharif			Rabi		
	Crop	Area (ha)	%	Crop	Area (ha)	%
1	Paddy	54,230	10.89	Paddy	15,794	3.17
2	Maize	56,102	11.27	Maize	1,658	0.33
3	Jowar	24,118	4.84	Jowar	4,874	0.98
4	Greengram	16,361	3.29	Groundnut	12,569	2.52
5	Blackgram	6,012	1.21	Bengalgram	1,883	0.38
6	Redgram	71,260	14.31	Sunflower	2,574	0.52
7	Cotton	77,213	15.51	Safflower	987	0.20
8	Castor	20,281	4.07	Others	4,321	0.87
9	Vegetables	9,930	1.99	-	-	-
10	Others	21,438	4.31	-	-	-
Sub Total		**3,56,945**	**71.68**	**Sub Total**	**44,661**	**8.97**

The agronomist's assessment is that there may not be any major changes in the proposed cropping pattern as compared to the existing cropping pattern in the command area of the project except for the large-scale introduction of chillies cultivation both during Kharif and Rabi seasons. Maize, chillies, black gram, red gram, cotton and castor are the main crops proposed in Kharif season whereas Vegetables, groundnut, Bengal gram, and Chillies are the proposed main Rabi crops in the command area of PRLIS. The gross cropped area in the command area of the project is assessed to be 5,73,723 ha and same accounted for 115.2% of the CCA. The net cropped area in the command area of the project is 495,837 ha. The season wise proposed cropping pattern as suggested by the agronomist in the command area of the project is presented in **Table 10.11.**

Table 10.11: Proposed Cropping Pattern in command area

Sl. No.	Crop	% of CCA	Area (Ha)
Kharif			
1.	Maize	19.79	98,533
2.	Chillies	15.54	77,369
3.	Blackgram	6.14	30,559
4.	Redgram	19.44	96,824
5.	Cotton	17.89	89,072
6.	Castor	1.59	7,901
7.	Vegetables	12.95	64,488
8	Groundnut	4.32	21,496
9.	Others	1.93	9,595
SUB TOTAL		**99.57**	**4,95,837**
Rabi			
1.	Vegetables	4.40	21,888
2.	Groundnut	2.84	14,123
3.	Bengalgram	2.01	9,987
4.	Chillies	6.40	31,888
SUB TOTAL		**15.64**	**77,886**
GRAND TOTAL		**115.21**	**5,73,723**

10.2.4 Proposed Canal and Distribution Network In Command Area

Under Phase -II the project activities, for which ToR has been issued by the MoEF&CC, New Delhi, shall involve construction of 13 main canals (Total length 915.47 km) and distribution network.

10.2.5 Proposed Works Stipulated Under Cad & Wm Programme

The various components of works underlined in the revised guidelines for CAD&WM programme issued by the Government of India, MoWR, River Development and Ganga Rejuvenation SP Wing, New Delhi, dated 17thSeptember,2015 in conjunction with the guidelines issued by the MPWRD have been followed along with the cost norms suggested therein. The command area development programme is an integrated action plan tailor made to accomplish the desired benefits due to irrigation through efficacy in the system with equitable distribution of water to the fields of stake holders on pro rata basis in the command of a specific project without degrading the command. It also includes such programme which are necessary for facilitating marketing of the produce. The other term Water Management connotes judicious and efficient management of the water resource created by participatory irrigation management by users by inculcating in them a sense of belongingness and ownership of the system created through aegis of SCADA. The latter is achieved by formulating Water User's Association for management and water distribution below outlet among beneficiaries. Besides formation of WUA, Distributary and Project Committee shall be formulated to dwell on the matters touching and arising from the regulation, operation, maintenance of the system under their administrative jurisdiction). All aspects of the CAD&WM Programme need to be taken up in an integrated and coordinated manner to achieve the envisaged objectives of raising food grains production to meet the increasing need for growing population.

10.2.5.1 On Farm Development Works

This comprises of construction of field channels and also land levelling / shaping and realignment of field boundaries, where necessary; extension, renovation and modernization and micro irrigation through sprinklers/drip irrigation This is an important activity under the programme for efficient utilization of irrigation water, properly planned, aligned and designed field channel should be constructed from the government outlet in a manner that each and every field of the outlet command is connected by field channel and related structures like, division boxes, measuring devices, drop structures, turnouts, flumes, inverted siphons, culverts etc.

Land Levelling and realignment of field boundaries

Lands having slope less than 0.6% are termed as almost flat and need not to be levelled. The earth movement needed for land grading/levelling should be kept minimum and the depth of cut should be such that the soil cover of the developed land will be sufficient to support the root zone for the crops proposed to be grown. Also, it should not be excessive (more than 30 cms) since, it would require the land a long period to build up their normal level of productivity. Earth work can be substantially reduced if the plots are demarcated between contours, by aligning the graded bunds parallel or little inclined to the contours, and width of plots are reduced especially in steep sloping areas. The land development or land shaping involves smoothening, grading,

forming earth bunds and land levelling. The soils at elevated spots or mounds are cut and put in the depressions to make uniform slopes. The aim is to achieve zero slope in the direction of irrigation as well as across.

Thus, for levelling of about 10% of the CCA i.e.,497976ha as per norms fixed under guide lines @ Rs. 6000/ha works as Rs29.88 lakhs which shall be shared by the centre and the state in equal proportion i.e.,50% each.

Construction of water courses and Field Channels

It is proposed to develop lined field channel for 90% of CCA as the balance 10% of the CCA shall be irrigated through micro irrigation. The cost of field channel for one ha CCA @Rs 6000/ha works out to Rs 268.90 crores.

Construction of infrastructure for Micro-irrigation

Work under this component is carried out as a replacement for OFD works which were in respect of field channels. Thus, for providing micro- irrigation in 10% of CCA i.e., 49798 ha as per norms fixed under guide lines @ Rs. 50000/ha works as Rs. 248.99 lakh which shall be shared by the centre and the state in equal proportion i.e.,50% each.

10.2.5.2 Construction of Field, Intermediate and Link Drains

Field drains help in draining out surplus water from the agricultural land to main and trunk drain. This prevents water logging in the crop field by which higher productivity is achieved and it helps in taking up cash crops after draining out the excess water from the field. Field drains are constructed to negotiate the excess rainfall water from fields to be drained into intermediate drains. Field drains or ditches should be at least 45 cm deep with side slopes ranging between 2:1 and 2.5:1. Drains are constructed considering the local ground slope and spotting of low elevation area, which would collect water from adjoining higher areas. Ditches should be as straight as possible. The cross-section of the field drain should be trapezoidal in shape to avoid side stability.

The drainage system is being designed on WMD methodology for maximum catchment area of 30 ha and for soil group “B” as applicable for the area and maximum rainfall252 mm for 24-hour duration.

Areal Correction factor = 0.8

Corrected value of rainfall (P) = 252x0.8 =202 mm

For soil group B, value of s=80.2 and Ia=24.1

By putting these values in rainfall-run –off equation

$Q=(P-Ia)^2 /\{ (P-Ia) +S\}$ =170.06mm

Volume of run-off $=30x10^4$ x0.17=51000 cum

No additional removal time shall be required in excess of usual 40 hours as the catchment area is less than 259 ha

Discharge =51000 /40x60x60 =0.35cumecs

Design of cross section of drain

Assuming bed width (b)=0.6 m; depth (d) =0.3 m, Rugosity co-efficient (n) =0.02 and s=0.01 and side slope of channel 1:1

Area of flow = b x d +d^2 = 0.6x0.3 + 0.3 ^{2}= 0.27 sq. m
Perimeter of flow (P) =0.6+2 √ (0.09+0.09) =1.17 m
Hydraulic Radius ®= A/P=0.27/1.17=0.23
Velocity (v) = (1/0.02) x $(0.23)^{0.666}$ x $(0.01)^{0.5}$ =1.9 m/sec
Q=0.27X1.9=0.51cumecs, which is >0.35cumecs

It is proposed to adopt a trapezoidal channel section of 0.6 mx0.5m including 20 cm freeboard with 1:1 side slope. The cost per running meter shall be about Rs.640.00. Considering 10 m length/ha, the total length shall be about 497957 m which shall entail a cost of Rs.3175lakh.

10.2.5.3 Reclamation of water-logged Areas

The slope of the tract of command (95%) is between 1-5%. Thus, it is having good surface drainage and suitable outlets are available for discharging the surface flow resulting from rainfall excess. The problem of water logging is not encountered in the command area and there is no occasion for development of surface/sub-surface drainage for reclaiming the water-logged area. Besides, the soil of the command is neutral and the water for irrigation has low SAR and shall be applied in small depth as compared to the paddy, the salinity problem may not come up. At present no salinity problem is witnessed in the area

10.2.5.4 Ayacut Roads and Communication Networks

A well-connected network of service roads is necessary to provide access to the fields of farmers, movement of bullock carts, tractors and for transport of seeds, fertilizers and agricultural produce to the markets besides, for movement of equipment and materials for maintenance and repairs of canal network by the O&M organization. Improved communications in and around command area are necessary for integrated development of the project. These may be achieved by

- Ayacut Roads, which are necessitated within the command for transportation of inputs to agriculture and produce.
- Link Roads, which connect command area to Ayacut roads and inter alia include works related to strengthening and reconstruction of existing roads to make them compatible with latest norms.
- Transmittal of messages from command area

The command area is also connected with Tehsil and district head quarter through State Highway, MDRs, link roads under PMGSY run across the command area. Tehsil head quarter is well connected to command area. However, the strengthening and reconstruction of some shall be needed for expeditious transport besides construction of new roads. In general, the following criteria shall be adopted for the development of road network:

- To provide all-weather road access within a distance of 1.5 Km from almost all parts of irrigated area

- To provide all-weather access to each village having population of 1500 and above.
- To include roads located outside the command area boundaries to the extent necessary and to link the network to market centres, railway stations, villages or administrative headquarters to have full impact on development of command are
- To limit the total provisions of roads to the minimum necessary subject to organization of the above criteria
- To provide minimum number of bridges or causeways necessary to comply with IRC requirements, which specify the acceptable interruptions to traffic appropriate to each category of road
- To allocate construction priorities in such a manner as to enable road works to be completed well in advance of the commencement of constructions of irrigation distribution network system.

All the Ayacut roads are classified as village roads and relevant IRC standards (IRC:64-1990), specifications and code of practice for village roads are adopted for design and construction of roads. Considering the road network in the area it is proposed to construct4km road within each Mandal in command area i.e., total length of 280 km single lane bituminous pavement road as Ayacut roads. The cost @Rs. 25 lakh/Km works out as Rs. 7000 lakhs. Besides this, a provision of Rs.1000lakhs are being made for strengthening and reconstruction of existing roads

10.2.5.5 Establishing Market Sheds

With a view to facilitate the farmer to directly sale his agriculture, an animal husbandry product, without intervention of the middleman, it is proposed to develop marketing amenities in the form of sheds (18mx6m) covered with GC sheets resting on iron trusses. It is proposed to develop such facilities at prominent places which are well connected by road. It is proposed to develop one such marketing places in each of Mandals in command area i.e., 70 numbers. The cost of the shed as well as a rest room works out to **Rs. 350 lakhs** (@ Rs. 5lakhs each.

10.2.5.6 Water Management

After creation of an irrigation resource in a region it is of paramount importance to chalk out a schedule of irrigation deliveries with details of the mode and duration of supplies drawn up for regulation of irrigation in the command area of an irrigation system. For accomplishing this state department resort to outlet wise “Osrabundi” or “Warabandi” It is a tool to organization for distribution of water allocation to water users by turn, according to an approved schedule indicating the day, duration and the time of supply. In order to develop participatory irrigation management through stake holders or farmers’ organization, the first requirement shall be to bring an Act for the purpose and vest power in the District Collector to cause notification to

- Delineation of water users’ area and constitution of an association
- Delineation of Distributary area and constitution of the Distributary Committee
- Delineation of Project area and construction of project committee

The District Collector shall make arrangements for the election of President of the Managing Committee of the Water Users’ Association by direct election by the method of secret ballot in the manner prescribed. The District Collector shall also cause arrangements for the election of

the members of Managing Committee by the method of secret ballot in the manner prescribed.

There shall be a Managing Committee for every Distributary Committee. The District Collector shall cause arrangements, in such manner as may be prescribed for the election by the Method of secret ballot of the President, and Members of the Managing Committee which shall not be more than five from amongst the members of the general body of the Distributary Committee

There shall be a Project Committee called by its distinct name for every project area. All the Presidents, of the Distributary Committees in the project area so long as they hold such office, shall constitute the general body for the Project Committee. The Project Committee shall have two nominated members, one of whom shall act as a coordinator between various departments and farmers' associations and who will be an Executive Engineer of Water Resources Department and second member will act as Advisor who will be from Agriculture or Ayacut Department. The District Collector, shall cause arrangements in such manner as may be prescribed for the election, by the method of secret ballot, of Chairperson, and Managing Committee consisting of not more than nine members from amongst the members of the general body of the Project Committee.

The objects of the farmers' organization shall be to promote and secure distribution of water among its users; adequate maintenance of the irrigation system, efficient and economical organization of water to organization agricultural production, to protect the environment, and to ensure ecological balance by involving the farmers, inculcating a sense of ownership of the irrigation system in accordance with the water budget and the operational plan. The functions of each of the committees viz., Water Users' Association (WUAs), Distributary Committees and the Project Committees are clearly elucidated Besides this it empowers the farmers' organization for carrying out the purposes of this Act, achieving the objects of the organization and performing its functions, levy and collect such fee as may be prescribed from time to time.

It is proposed to have Farmers Organization to comprise of 13projectcommittee, 50 distributary committees. There shall be 102WUAs for minor and each shall have four territorial constituencies.

10.2.5.7 One-time Grant to WUAs

The project proponent/SCADA with the help of the District Collector shall delineate the water user area get WUAs elected/registered in due course of time by working in close association with Revenue Department. One-time functional grant shall be payable to the elected/registered WUAs @ Rs. 1200/ha to be apportioned between centre, state and farmers in proportion of 45%, 45% and 10%respectively. Thus, on this account, functional grant for ha works out to be Rs. 5974 lakhs. The infrastructure grants for 165WUAs @ Rs. 3 lakh works out to Rs. 495 lakhs, which shall be shared between centre and state in the ratio of 75% and 25%.

10.2.5.8 Farmer's Training, Monitoring and Evaluation

Training camps are organized in villages to educate the farmers on water management and crop management. This is important activity for educating the farmers to adopt modern technologies for achieving higher production with regulated water supply. Software activities viz. farmers training, monitoring, evaluation, demonstration on micro irrigation, mechanized land levelling,

water use efficiency shall be covered under farmers training programme. The cost on this head @ Rs.1000/ha works out to **Rs. 4978 lakhs.**

10.2.5.9 Conjunctive Use of Ground Water

Off late, it is increasingly realized that combined use of surface and groundwater are essential to optimize resource use and minimizing adverse effect of overusing the single form of water Conjunctive use can be defined as "judicious use of surface and groundwater". As part of conjunctive use, in the years of plenty, surface water is stored underground in aquifers and used in the dry years to supplement the surface water resources, which may have become scarce

Therefore, in command area covered in mandals which have been categorised as safe taking into consideration the availably of groundwater, conjunctive use of groundwater is suggested in about 1000 ha area by developing tube wells

Assuming an average area that could be irrigated under a single bore-well at 10 ha., about 100 bore-well irrigation systems will be constructed to irrigate about 1000 ha. The construction costs, finance by the government would include: drilling and borehole development; casing; pump and motor assembly; and labour cost. All the wells will be connected to a common distribution network, covering the entire area earmarked for groundwater irrigation. The farmers will pump into the common distribution network and the community-based institutions would ensure equitable distribution of groundwater to all parts of the water grid. The water grid will also compensate for variable well discharges in different parts of the land parcel. To develop the conjunctive use of groundwater a financial provision of Rs. 2000 lakhs have been made.

10.2.6 Proposed Cost of CAD & WM Programme and Cost Sharing

The total cost of works proposed under CAD&WM Programme has been computed as **Rs. 74985 lakh** and the central, state farmer share against each item has been mentioned in **Table 10.12.**

Table 10.12: Proposed Cost under CAD&WM Programme and Cost Sharing

S.N.	Item	Cost (Rs Lakh)	Central Share	State Share	Farmers Share
1	Land Levelling	2988.00	50%	50%	Nil
2	Construction of water courses, field channels	26890.00	50%	50%	Nil
3	Micro-Irrigation as a replacement of OFD works for 10% CCA	24899.00	50%	50%	Nil
4	Construction of Field Drains	3175.00	50%	50%	Nil
5	One-time financial grant to WUAs	5974.00	45%	45%	10%
6	One-time Infra-Structure grant to WUAs	495.00	75%	25%	Nil
7	Training, Monitoring and Evaluation	4978.00	75%	25%	Nil
8	Conjunctive use of groundwater	2000.00	Nil	100%	Nil
9	Establishment cost @ 12% on item 2&3	3585.60	50%	50%	Nil
	Grand Total	**74984.60**			
	Say	**74985.00**			

10.3 COMPENSATORY AFFORESTATION SCHEME

10.3.1 General

The term 'Forest land' mentioned in Section 2 of the Forest, (Conservation) Act, 1980, refers to reserved forest, protected forest or any area recorded as forest in the Government records. Lands, which are notified under Section 4 of the India Forest Act, would also come within the purview of the Act. (Supreme Court's Judgement in the NTPC's case). It would also include "Forest" as understood in the dictionary sense (Supreme Court order dated 12.12.1996 in WP No. 202/1995-Annexure-I). All proposals for diversions of such areas to any non-forest purpose, irrespective of its ownership, would require the prior approval of the Central Government.

10.3.2 Forest Land Requirement of The Project

10.3.2.1 Phase-I

For Phase-I works, diversion of 205.48 ha of forest land in Achampet Division of Nagarkurnool District for works of Lift-I Pumphouse, formation of Anjanagiri Reservoir, tunnel in between Anjanagiri reservoir at Narlapurand Veerajanya Reservoir at Yedula was involved for which Stage-I and Stage-II Clearances have been accorded by MoEF&CC vide F.N.8-43/2017-FC, dated 3.4.2018 and vide F.N.8-43/2017-FC, dated 25.1.2019 respectively. As per condition at S.N. xx of Stage-I approval letter, the CAT Plan shall be implemented by State the Forest Department from the funds provided by the User Agency.

10.3.2.2 Phase-II

For construction of works of main canal and distributaries envisaged under Unit -II of the DPR of project and as per alignment marked as per survey, the proposed 13 canals and their distributaries are not aligned in the forest land. The canal alignment is in private land ("Patta" land) and state land. Thus, there is no requirement of forest land for the project.

10.3.3 Compensatory Afforestation

10.3.3.1 Phase-I

As per condition at S.N. ii of Stage-I approval letter, the Compensatory Afforestation over equivalent non-forest land (205.48 ha) shall be raised within a period of three years as per approved plan with at least 1000 saplings/ha to be planted over 205.4811 ha by the State Forest Department from the funds provided by the User Agency. In the present case on demand raised, the User Agency had deposited Rs.28,78,67,917 towards cost of CA. Besides this this the User Agency had also deposited (i) Rs 4,56,86,212 towards 25% cost of CA for SMC works, (ii) Rs 1,60,79,208 towards cost of Wildlife Conservation Plan,(iii) Rs 1,02,58,852 for raising plantation along the periphery of the proposed reservoir,(iv) Rs 12,86,31,169 NPV @ Rs6.26 lakh/ha,(v)Rs 1,53,60,000 towards cost of construction of boundary pillars.(vi) Rs 8,11,200 as Cost of extraction of tree growth and enumeration charges,(vi) Rs 7,38,06,719 as Penal CA and (vii) Rs 2,32,22,717 as penal NPV. Thus, the total cost of CA is Rs 60,17,23,994,

10.3.3.2 Phase-II

In the wake of the fact that no diversion of forest land is involved for the project, compensatory afforestation plan is not to be formulated under EMP.

10.3.4 Cost Estimate Compensatory Afforestation

The total cost of compensatory afforestation as per payment already made on this count to Forest Department is shown in **Table 10.11.**

Table 10.11: Cost Estimate Under Compensatory Afforestation

S No	Cost of Forest Diversion	Rs Lakhs
Phase-I		
1	NPV	1286.31
2	CA in NFL and DFL	2878.67
3	Cost of SMC	456.86
4	Others	970.28
5	Raising of Planation along the periphery	102.58
6	Cost of Boundary Pillars at 20 m interval	153.60
7	Cost of extraction of tree growth& Enumeration charges	8.11
	Total Phase-1	**5856.41**
	Say	**5856.00**
Phase-II		
1	Cost under CAT Plan	0.00
	Total Phase-1&II	**5856.00**

10.4 WILDLIFE AND BIODIVERSITY MANAGEMENT PLAN

10.4.1 Objective

This plan envisages wildlife management and the conservation of biodiversity and sustenance of livelihood as long-term goals. A plan for conserving the biodiversity of the area, ecological rehabilitation of the tract by pasture development and enrichment, afforestation and land stabilization measures, improving water regime, control of illicit poaching are some of the steps to protect and conserve the biodiversity of the area. The overwhelming and callous exploitation of natural forest resources for monetary reasons has culminated into vast habitat destruction. The other bio- diversity damage causing attributes are the encroachment of forests, frequent forest fires, uncontrolled browsing of animals, collection of habitat fragmentation and pollution due to industrialization and ribbon urban development in the vicinity of forest areas. As per State Environment report, Telengana,2015, Forest area under encroachment in Rangareddy, Nalgonda and Mahbubnagar districts are 10.62%, 4.60% and 0.45% of the total territorial area of respective district.

Though no diversion of forest land is required for Phase-II works involving construction of main

canals and distributaries, yet at some places the alignment is closed to the forests. During construction phase of canals significant impacts are anticipated due to air and nose pollution, though there is no submergence involved. The formation of canal section and spoil banks result into degradation of land and loss to biological resources existing on land to be acquired. The canals aligned near to the forest boundary, though directly do not fragment the forests but are a linear barrier to the free movement of wildlife from fringe area of forests to non-forest area.

10.4.1.1 Wildlife Management and Conservation

Two Schedule-I mammalian species viz., *Canip Lupus* and *Panthera pardus* and one avifauna specie viz *pavo cristatus have* been reported in command area. No any RET species of flora has been found in the command area, yet the protection of nearby forest area is needed during construction due to influx of labour in the area. The provision under section 41 of the Biological Diversity Act,2002, conjointly read with Telangana State Biodiversity Rules, 2015, calls upon every local body for constituting of Biodiversity Management Committee with a view to promoting and conserving the bio-diversity of the area. The management inputs must be appropriate to allow nature to function within natural parameters. The preference of key stone species of the catchment area must be analysed for habitat manipulation and management intervention. The following activities are proposed for the management and conservation of biodiversity of the catchment.

10.4.1.2 Pasture improvement and afforestation

Improvement of pastures and planting of indigenous useful species will be undertaken. Rotational grazing in pastures and stocking by genetically superior and improved varieties of grass involving stakeholders will decrease overgrazing and pasture degradation.

10.4.1.3 Creation of water resources

Construction of water ponds and check- dams at appropriate places will help in augmentation of the water regime.

10.4.1.4 Soil conservation measures

Construction of Bioengineering/ engineering structures to arrest the soil erosion and land degradation will help in stabilization of the strata. Soil conservation along steep slopes improves water regime, which is conducive to support vegetation and thereafter be stabilized.

10.4.1.5 Strengthening the protection mechanism

Wild populations are to be protected against poaching for which support in the form of equipment and training will be required. Wildlife health initiation by inoculating local cattle to minimize the spread of diseases to the wild population required support.

10.4.1.6 Livestock and Fodder Improvement

The aim is to improve productive potential through improvement of fodder, management practices and genetic upgrading of the livestock. It will also contribute towards restoration of health, vigour and purity of the production environment. As targeted support to nomadic groups, this subcomponent will include implementation of Development Plans, which are aimed at better flock management, improved animal health care and promotion of income generating

activities for the migratory glaziers. Special emphasis will be given on reducing man -animal conflict in the area and due compensation will be paid to the farmers for loss of human and cattle life and agriculture produce done by wild animals after identifying mutually agreeable criteria. Livestock health will be improved by completing existing practices with additional support in terms of medicines, de-worming, vaccination, veterinary, aid-kits and organizing veterinary health camps on a regular basis making use of the existing veterinary facilities. Support will also be provided for activities like nutritive food for rearing young calves by complementing the existing system in place. Based on the need, support will be provided in terms of facilities for artificial insemination as well as natural breeding by strengthening the existing veterinary services already available in the area.

10.4.2 Wildlife Management

Buffer forest areas can be developed as wildlife habitat by resorting to restorative strategies, which inter alia would into the following:

- Redressing man animal conflict
- Habitat improvement measures
- Anti-poaching operations
- Capturing problematic and aberrant animals
- Staff development and capacity building

10.4.2.1 Redressing man-animal conflict

The villages in catchment have chunk of agricultural land and people are mainly depending upon rain fed crops. Wild animals like Blue- Bull often damage their crops, which is the main man-animal conflict around the area. However, Wildlife (Protection) Act, 1972, authorizes Chief Wildlife Warden and Officers acting on his behest to permit killing of such wild animals causing destruction to life and property, yet the local due to religious sentiments do not opt for animal killings. In such a scenario, adequate compensation shall be made to suffering stakeholders near the buffer areas. To avoid revenge killing the compensation in case of loss of human life, resulting from man-animal conflict, shall be made @ Rs. 2.0 lakh / victim while for serious injuries Rs. 0.6 lakh / person. Besides crop protection structures can be erected at prominent places and cages/traps to catch problematic animals can be deployed.

10.4.2.2 Habitat Improvement Measures

The activities under this sub-head mainly comprises of such initiative, which will improve the forage and browse values of the habitat for wild animals. The works like creating water holes, water-retaining structures, pasture land reclamation (grass improvement) and eradication of weeds. Works like burning regime, seeding and grass cutting, Improvement of Escape and reproductive cover shall be undertaken. The improvement in the floral diversity in the buffer area can be partly achieved from plantation under green belt to be carried out under the environment management plan proposed under the EIA/EMP report.

10.4.2.3 Anti-Poaching Operations

Under this sub-head deployment of anti-poaching squads drawn from army personnel and

home guard, deployment of special tiger protection force (STPF) shall be the main constituent of the plan. Besides this establishment and maintenance of patrolling camps/ chokies equipped with wireless sets/mobile phones and procurement of field gear, night vision devices shall be the other ingredients.

10.4.2.4 *Capturing problematic and aberrant animals*

This will involve procurement and deployment of traps, cages to catch aberrant animals besides procurement of tranquilizing equipment.

10.4.2.5 Staff development and capacity building

Under this sub-head specialized training in the field of management planning, park interpretation through conducting workshops / seminars / study tours for appraisal of good practices followed in other reserves. Apart from this training in the use of GIS systems and anti-poaching operations shall be imparted.

10.4.3 Capacity Building and Skill Upgradation

For quality management inputs, the capacity of the field staff deployed will be enhanced with appropriate training inputs in relevant fields at regular intervals. Exposure visits and on field study tours to the well managed protected areas and other well-managed sanctuaries will be organized. Besides training in wildlife management, field staff will also be sent to human and social development management courses.

10.4.4 Financial Allocation

The comprehensive biodiversity management plan requires a detailed biological diversity assessment in the project area. The financial allocation is based on the actual amount of Rs161.00 lakh paid to the Forest Department for Phase-I works and identified components under the plan for Phase-II works. An amount of **Rs 539 lakhs** have been proposed for Phase-II, and plan has been approved by PCCF, Chief Wildlife Warden, Forest Department, Govt. Telangana. The Approval NOC letter of PCCF and Wildlife conservation plan is enclosed in **Annexure V**. The budgetary break-up of the conservation plan is shown in **Table 10.13**.

Table 10.13: Wildlife Management and Conservation Plan

Year	Activities	Budget to be allocated (INR) in Lakhs
1st Year Phase-II	Organizing Wild Life Awareness Programmes for conservation of wildlife and awareness of local people and students (Engaging one Educational Officer, One Eco-development Officer and One Biologist for organizing programs)	15.000
	Establishment of Animal Rescue Station, purchase of Rescue Van with equipment and Squad (Veterinary Officer & Trained teams)	25.000
	Purchase of equipment's such as Nets, tranquillizers equipment's and Cages etc. for proper rescue and translocation of wild animals	2.000
	Training the Emergency Response & Rescue Team	2.000
	Survey and identification of Habitats of above Schedule-I animals	5.000

Year	Activities	Budget to be allocated (INR) in Lakhs
	and birds like Vulture, Smooth coated otter, Crocodile, Wolf & Blackbuck.	
	Survey, site identification, Construction of Khelis/ Water holes (Small water Ponds, Percolation tanks and check dam inside forests) & Rainwater harvesting pits in the study area and environs	20.000
	Identification of natural habitats (forests, weed eradication, pastures, grasslands etc.) for Conservation measures	10.000
	Promotion & Distribution of Alternative Energy Sources such as Solar Power, Biogas in the Project Affected Villages	5.000
	Installation of submersible water pumps of solar for wild animal in ATR	14.000
	Monitoring wildlife through E-eye (E-Surveillance) to prevent man-animal conflict in Amrabad Tiger Reserve	50.000
	SUBTOTAL	**148.000**
2nd Year	Organizing Wild Life Awareness Programmes for conservation of wildlife and awareness of local people and students (Engaging one Educational Officer, One Eco-development Officer and One Biologist for organizing programs)	15.000
	Maintenance and running charges of Animal Rescue Station & Emergency Response Team (Veterinary Officer & Trained teams).	5.000
	Construction of Fire watch tower cum protection sheds for wildlife	13.000
	Conservation programmes for natural habitats (forests, weed eradication, pastures/grasslands etc.) for Conservation measures	5.000
	Engaging Animal Trackers for protection and conservation of Schedule-I animals and their habitats, which were identified during 1st year.	5.000
	Construction of water Khelis/ Water holes, artificial ponds & rainwater harvesting pits etc.	10.000
	Plantation of suitable fruit & flower bearing plant species in the Study area so that the wild herbivores animals can reside within the forest.	15.000
	Installation of solar submersible water pumps for wildlife	18.000
	Promotion & Distribution of Alternative Energy Sources such as Solar Power, Biogas in the Project Affected Villages	2.000
	Maintenance of tree groves, Dense bushy structure and roosting and nesting sites	2.000
	Monitoring wildlife through E-eye (E-Surveillance) to prevent man-animal conflict in Amrabad Tiger Reserve	50.000
	SUBTOTAL	**140.000**
3rd Year	Organizing Wild Life Awareness Programmes for conservation of wildlife and awareness of local people and students (Engaging one Educational Officer, One Eco-development Officer and One Biologist for organizing programs)	15.000
	Maintenance and running charges of Animal Rescue Station & Emergency Response Team (Veterinary Officer & Trained teams).	5.000
	Construction of water Khelis/ Water holes, artificial ponds & Rainwater Harvesting Pits etc.	20.000
	Engaging Animal Trackers for protection and conservation of	5.000

Year	Activities	Budget to be allocated (INR) in Lakhs
	Schedule-I animals and their habitats, which were identified during 1st year.	
	Construction of fire watch tower cum protection sheds for Wildlife	10.000
	Conservation programmes for natural habitats (forests, pastures/grasslands etc.) for Conservation measures	5.000
	Maintenance & Repair of submersible solar water pumps.	10.000
	Maintenance of plantation of suitable fruit & flower bearing plant species in the Study area so that the wild herbivores animals can reside within the forest.	5.000
	Promotion & Distribution of Alternative Energy Sources such as Solar Power, Biogas in the Project Affected Villages	5.000
	Maintenance of tree grooves, Dens bushy structure and roosting and nesting sites	2.000
	Maintenance Monitoring wildlife through E-eye (E-Surveillance) to prevent man-animal conflict in Amrabad Tiger Reserve	25.000
	SUBTOTAL	**107.000**
4th Year	Organizing Wild Life Awareness Programmes for conservation of wildlife and awareness of local people and students (Engaging one Educational Officer, One Eco-development Officer and One Biologist for organizing programs)	15.000
	Maintenance and running charges of Animal Rescue Station & Emergency Response Team (Veterinary Officer & Trained teams).	5.000
	Engaging Animal Trackers for protection and conservation of Schedule-I animals and their habitats, which were identified during 1st year.	5.000
	Conservation programmes for natural habitats (forests, pastures/grasslands etc.) for Conservation measures	5.000
	Maintenance & Repair of submersible solar water pumps.	5.000
	Maintenance of tree groves, Dens, bushy structure and roosting and nesting sites.	5.000
	Maintenance of plantation of suitable fruit & flower bearing plant species in the Study area so that the wild herbivores animals can reside within the forest.	5.000
	Construction of water Khelis/ Water holes, artificial ponds & Rainwater Harvesting Pits etc.	10.000
	Construction of fire watch tower cum protection sheds for Wildlife	12.000
	Maintenance Monitoring wildlife through E-eye (E-Surveillance) to prevent man-animal conflict in Amrabad Tiger Reserve	10.000
	SUBTOTAL	**77.000**
5th Year	Organizing Wild Life Awareness Programmes for conservation of wildlife and awareness of local people and students (Engaging one Educational Officer, One Eco-development Officer and One Biologist for organizing programs)	15.000
	Maintenance and running charges of Animal Rescue Station & Emergency Response Team (Veterinary Officer & Trained teams).	5.000
	Engaging Animal Trackers for protection and conservation of Schedule-I animals and their habitats, which were identified during 1st year.	5.000

Year	Activities	Budget to be allocated (INR) in Lakhs
	Conservation programmes for natural habitats (forests, pastures/grasslands etc.) for Conservation measures	5.000
	Maintenance of plantation of suitable fruit & flower bearing plant species in the Study area so that the wild herbivores animals can reside within the forest.	5.000
	Maintenance of tree groves, Dens, bushy structure and roosting and nesting sites.	5.000
	Construction of water Khelis/ Water holes, artificial ponds & Rainwater Harvesting Pits etc.	5.000
	Construction of fire watch tower cum protection sheds for Wildlife	12.000
	Maintenance Monitoring wildlife through E-eye (E-Surveillance) to prevent man-animal conflict in Amrabad Tiger Reserve	10.000
	SUBTOTAL	**67.000**
Total Phase-II		**539.000**
Phase-I		
	Cost of Wildlife Conservation Plan already paid to by the State Forest Department on their demand during	**160.79**
Say		**161.000**
Total Phase I&II		**700.000**

10.5 RESETTLEMENT AND REHABILIATION PLAN

10.5.1 Introduction

Like any other development / infrastructure project for the public purpose, land (Public and Private) invariably is to be acquired by the appropriate government either for its own use or for a requiring body, as the case may be. The total land requirement for entire project shall be 28273 ha comprised of 12483 ha and 15790 ha for Phase-I &Phase-II respectively. The apportionment between Government, Patta and forest land requirement under Phase-I shall be 2768.86 ha, 9508.60ha and 205.54 ha respectively whereas for Phase-II it shall be 2698 ha, 13092ha and nil ha respectively. The total Patta land required for the main canal and for distribution system shall be 6195 ha and 6897 ha respectively.

Though the project has been conceived with the sole objective of minimal displacement of people because their property in the project affected area, the compulsory acquisition of land for public purpose has been necessitated. The acquisition of the land shall be in consonance with "The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013", (RFCTLARRA 2013) which has come into force from 1-1-2014, notified by Government of India.

10.5.2 Social Impact Assessment Studies

The Socio-economic survey of the project-affected village (PAV) and project affected Families (PAF) in the form of household survey was undertaken for gathering baseline information on various socio-economic parameters, which included the following:

a. Assessment as to whether the proposed acquisition serves public purpose.
b. Estimation of project affected families including families likely to be displaced.
c. Extent of land (Public / Private), houses and other assets, to be affected by the acquisition.
d. Feasibility of Acquisition at an alternative place.
e. Assessment of bare minimum extent of land needed for the project.
f. Study of social impact and mitigate cost in addressing these and its ramification on the overall cost of the project vis-à-vis the benefits of the project.

10.5.2.1 Public Purpose

In the wake of the fact that the land to be acquired is within the territory of, the State Government of Telangana is the Appropriate Government intends to acquire the land for construction of the infrastructure projects. In the present case, the proposed Irrigation project is essentially an infra-structure project included in the Annexure-I of the Notification of the Govt. of India, Department of Economic Affairs (Infrastructure Section) No. 13/6/2009-INF dated 27 March 2012 and even no. amendment dated 1st April 2013. Thus, the provisions of "The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013" applies in respect of all activities related to land acquisition for the project.

10.5.2.2 Details of Land Acquisition

Phase-I

Under Phase-I the requirement of (Patta land) has been estimated as 12277.46 ha of which about 10524.38 ha has already been acquired at different times under different norms of land compensation and rates of land applicable at the time of acquisition. Now balance land to be acquired is 1753.08 ha. District wise land Acquisition details for Phase-I is given under **Table10.14**.

Table 10.14: District wise land Acquisition details for Phase-I

S.N.	District	Total land Required (ha)	Total Acquired (ha)	Balance to be Acquired (ha)
1	Nagarkurnool	4771	4597	174
2	Wanaparthy	1766	1738	28
3	Mahabubnagar	4762	43903	309
4	Vikarabad	768	0	768
5	Ranga Reddy	416	0	416
Total		12483	10729	1754

Phase-II

Main Canal-wise details of project affected families and total "Patta" land, revenue land and forest land to be acquired is shown in **Table 10.15**. It is evident that there shall be 6726 affected families, whose land shall be acquired of which there shall be no displaced families (who because of acquisition of land and house has to be re-located and resettled from the affected area to the resettlement area).

Table 10.15: Canal wise Details of Land Acquisition

Canal	District	Length (km)	Ayacut (ha)	PAF (no.)	Main Canals(ha)			Total (ha)
					Govt.	Patta	Forest	
VMC	Nagarkurnool	84	21706	614	2	736	0	737
	Mahabubnagar	35	9058	385	11	451	0	462
	Ranga Reddy	33	6777	294	3	350	0	354
	Nalgonda	0	9828	0	0	0	0	0
Sub -total VMC		**152**	**47368**	**1293**	**16**	**1537**	**0**	**1553**
LLC	Nagarkurnool	19.3	2489	98	0	119	0	119
	Mahabubnagar	10.3	3989	48	0	59	0	59
Sub -total LLC		**29.6**	**6478**	**146**	**0**	**178**	**0**	**178**
HLC	Mahabubnagar	108	61134	672	112	694	0	806
LLC	Mahabubnagar	36	12551	218	23	238	0	261
SMC	Mahabubnagar	17.5	5680	29	2	33	0	34
	Nagarkurnool	7.5	6466	13	0	15	0	15
Sub -total SMC		**25**	**12146**	**42**	**2**	**48**	**0**	**49**
RMC-1R	Mahabubnagar	4.6	3644	19	0	23	0	23
RMC-2R	Mahabubnagar	13	23516	138	4	162	0	166
	Ranga Reddy	59	22777	571	9	676	0	685
	Nagarkurnool	0	11197	0	0	0	0	0
Sub -total RMC-2R		**72**	**57490**	**709**	**13**	**838**	**0**	**851**
LMC	Vikarabad	133	48583	932	277	841	0	1118
	Mahabubnagar	4.73	0	59	8	63	0	71

Canal	District	Length	Ayacut	PAF	Main Canals(ha)			Total
Sub -total LMC		**137.73**	**48583**	**991**	**285**	**904**	**0**	**1189**
Maddur	Mahabubnagar	40	22162	279	2	333	0	335
	Vikarabad	73.2	48283	204	17	229	0	246
Sub -total Maddur		**113.2**	**70445**	**483**	**19**	**562**	**0**	**581**
Hanwada	Mahabubnagar	15	8730	159	0	191	0	191
	Vikarabad	7.74	2201	89	0	107	0	107
Sub -total Hanwada		**22.74**	**10931**	**248**	**0**	**298**	**0**	**298**
EMC	Vikarabad	1	0	6	0	7	0	7
	Ranga Reddy	105	79198	807	166	802	0	968
	Mahabubnagar	0	46	0	0	0	0	0
	Nalgonda	0	2052	0	0	0	0	0
Sub -total EMC		**106**	**81296**	**813**	**166**	**809**	**0**	**975**
NMC	Vikarabad	89	39413	1044	1244	9	0	1253
	Ranga Reddy	0	32652	0	0	0	0	0
Sub -total NMC		**89**	**72065**	**1044**	**1244**	**9**	**0**	**1253**
SMC	Vikarabad	0.6	78	0	0	8	0	8
	Ranga Reddy	19	3958	48	8	49	0	57
	Mahabubnagar	0	9810	0	0	0	0	0
Sub -total SMC		**19.6**	**13846**	**48**	**8**	**57**	**0**	**65**
Grand Total		**915.47**	**497976**	**6726**	**1888**	**6195**	**0**	**8083**

10.5.2.3 Extent of land (Public / Private), houses and other assets, to be affected

The total Patta land required for the main canal and for distribution system shall be 6,195 ha and 6,897 ha respectively **(Table 10.16.)** No residential structure, shop and cattle shed shall be acquired.

Table 10.16: District-wise details of PAF

S.N.	District	No. of PAF	Patta Land to be Acquired for main canal (ha)	Patta Land to be Acquired for branches distributaries and minors (ha)	Total Patta Land(ha)	Other Assets		
						Houses	Shops	Cattle Shed
1	Mahabubnagar	3027	1681	1750	3431	-	-	-
2	Rangareddy	3670	1877	1802	3679	-	-	-
3	Nalgonda	185	0	200	200	-	-	-
4	Vikarabad	5795	1201	2100	3301	-	-	-
5	Nagarkurnool	1195	870	560	1430	-	-	-
6	Narayanpet	1019	566	485	1051			
Total		**14,891**	**6,195**	**6,897**	**13,092**	-	-	-

10.5.2.4 Feasibility of Acquisition at an alternative place.

The siting and alignment of the project components like main canal and distribution network etc. is mainly based on the elevation of command area vis-à-vis the FSL of canal such that for a gravity canal system. During investigation and planning stage and at the time of preparation of DPR, detailed surface investigations are carried out at different alternative sites and balance is struck in favour of the best alternative. As, the site of storage reservoirs from which canal shall take off has been firmed up, proposed canal project is site specific. Thus, it is clear that land acquisition at any other alternative place for locating the project components is not plausible by

any stretch of imagination

10.5.2.5 Assessment of bare minimum extent of land needed for the project.

The land requirement for various components of the project have been in sync with the dimensions determined based on detailed hydraulic as well as structural design. The land required for various reaches of main canals is based on designing the canal sections as per standard design practices. The canal section has been provided with side slopes, berm width, service road width, free board as per IS 7112: 2002, "Criteria for design of cross section for unlined canals in alluvial soil. standard designed practices, IS: 6966(Part-I). The alignment of main canals and distribution network and their dimension has been finalized based on the disposition of command area these shall be serving. For most of the length the canals are in cutting, cutting and filling barring few reaches the canal section shall be in filling (Banking). In some of the reaches, the canals are in deep cutting and in rock strata. From such reaches huge quantity of rock mass shall be generated due to excavation. From reaches involving cutting, the muck which shall comprise of earth and rock mass shall be disposed on spoil banks on either side of the canals. The rock mass shall be separately stacked in spoil banks so that it can be transported to stone crushing units for manufacturing of crushed aggregate of various sizes/grades and into crushed sand. Thus, to keep the land requirement to the minimum, an all-out effort has been made during planning and designing stage.

10.5.3 Resettlement and Rehabilitation Principles

Based on the primary and secondary data collected in respect of the project affected families a draft R & R Plan has been formulated in consonance with the principles enunciated in "The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013", which has come into force from 1-1-2014, notified by Government of India. Besides this meeting the mandatory requirement, certain works relating to social welfare and community development are also considered in consultation with local authorities and representatives of affected families to make the R&R Plan for the proposed project so that more acceptability for implementation of the plan is achieved.

10.5.3.1 Definitions followed in the Present R&R Plan

For this project, procedure and compensation will be as per the RFCT_LARR 2013 and following key definitions will be followed:

(a) "Administrator" means an officer appointed for the purpose of rehabilitation and resettlement of affected families under sub-section (l) of section 43;

(b) "Affected area" means such area as may be notified by the appropriate Government for the purposes of land acquisition; (c) 'affected family" includes-

(i) A family whose land or other immovable property has been acquired;

(ii) A family which does not own any land but a member or members of such family may be agricultural labourers, tenants including any form of tenancy or holding of usufruct right, share-croppers or artisans or who may be working in the affected area for three years prior to the acquisition of the

land, whose primary source of livelihood stand affected by the acquisition of land;

(iii) The Scheduled Tribes and other traditional forest dwellers who have lost any of their forest rights recognized under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 due to acquisition of land;

(iv) Family whose primary source of livelihood for three years prior to the acquisition of the land is dependent on forests or water bodies and includes gatherers of forest produce, hunters, fisher folk and boatmen and such livelihood are affected due to acquisition of land;

(v) A member of the family who has been assigned land by the State Government or the Central Government under any of its schemes and such land is under acquisition;

(vi) A family residing on any land in the urban areas for preceding three years or more prior to the acquisition of the land or whose primary source of livelihood for three years prior to the acquisition of the land is affected by the acquisition of such land;

(c) "Agricultural land" means land used for the purpose of--

(i) agriculture or horticulture;

(ii) dairy farming, poultry farming, pisciculture, sericulture, seed farming breeding of livestock or nursery g rowing medicinal herbs;

(iii) raising of crops, trees, grass or garden produce; and

(iv) and used for the grazing of cattle;

(d) "Appropriate Government" means, -

(i) In relation to acquisition of land situated within the territory of, a State, the State Government:

(ii) In relation to acquisition of land situated within a Union territory (except Puducherry), the Central Government;

(iii) in relation to acquisition of land situated within the Union territory of Puducherry, the Government of Union territory of Puducherry;

(iv) In relation to acquisition of land for public purpose in more than one State, the Central Government, in consultation with the concerned State Governments or Union territories; and

(v) In relation to the acquisition of land for the purpose of the Union as may be specified by notification, the Central Government:

(vi) Provided that in respect of a public purpose in a District for an area not exceeding such as may be notified by the appropriate Government, the

Collector of such District shall be deemed to be the appropriate Government;

(e) "Authority" means the Land Acquisition and Rehabilitation and Resettlement Authority established under section 5l;

(f) "Collector" means the Collector of a revenue district, and includes a Deputy Commissioner and any officer specially designated by the appropriate Government to perform the functions of a Collector under this Act;

(g) "Commissioner'' means the Commissioner for Rehabilitation and Resettlement appointed under sub-section (l) of section 44;

(h) "Cost of acquisition" includes-

(i) Amount of compensation which includes solatium, any enhanced compensation ordered by the Land Acquisition and Rehabilitation and Resettlement Authority or the Court and interest payable thereon and any other amount determined as payable to the affected families by such Authority or Court;

(ii) Demurrage to be paid for damages caused lo the land and standing crops in the process of acquisition;

(iii) Cost of acquisition of land and building for settlement of displaced or adversely affected families;

(iv) Cost of development of infrastructure and amenities at the resettlement areas;

(v) Cost of rehabilitation and resettlement as determined in accordance with the provisions of this Act:

(vi) Administrative cost, -

(A) For acquisition of land, including both in the project site and out of project area lands, not exceeding such percentage of the cost of compensation as may be specified by the appropriate Government;

(B) For rehabilitation and resettlement of the owners of the land and other affected families whose land has been acquired or proposed to be acquired or other families affected by such acquisition;

(i) Cost of undertaking 'Social impact Assessment study'; (j) "company" means-

(ii) A company as defined in section 3 of the Companies Act, 1956. Other than a government company:

(iii) A society registered under the Societies Registration Act, 1860 or under any corresponding law for the time being in force in a State;

(k) "Displaced family" means any family, who on account of acquisition of land has to be

relocated and resettled from the affected area to the resettlement area;

(l) "Entitled to act" in relation to a person, shall be deemed to include the following persons, namely:

(i) Trustees for other persons beneficially interested with reference to any such case, and that to the same extent as the person beneficially interested could have acted if free from disability;

(ii) The guardians of minors and the committees or managers of lunatics to the same extent as the minors, lunatics or other persons of unsound mind themselves, if free from disability, could have acted:

Provided that the provisions of Order X XX II of the First Schedule to the Code of Civil Procedure,

I908 shall, mutatis mutandis, apply in the case of persons interested appearing before a Collector or Authority by a next friend, or by a guardian for the case, in proceedings under this Act:

(m) "family" includes a person, his or her spouse, minor children, minor brothers and minor sister's dependent on him:

Provided that widows. divorcees and women deserted by families shall be considered separate families:

Explanation. -An adult of either gender with or without spouse or children or dependents shall be considered as a separate family for the purposes of this Act.

(n) "Holding of land" means the total land held by a person as an owner, occupant or tenant or otherwise;

(o) "Infrastructure project" shall include any one or more of the items specified in clause (b) of subsection (/) of section 2;

(p) "Land" includes benefits to arise out of land, and things attached to the earth or permanently fastened to anything attached to the earth:

(q) "Landless" means such persons or class of persons who may be, -

(i) considered or specified as such under any State law for the time being in force; or

(ii) in a case of landless not being specified under sub-clause (i), as may be specified by the appropriate Government;

(r) "Land owner" includes any person, -

(i) Whose name is recorded as the owner of the land or building or part thereof, in the records of the authority concerned; or

(ii) Any person who is granted forest rights under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 or under any other law for the time being in force; or

(iii) Who is entitled to be granted Patta rights on the land under any law of the State including assigned lands: or

(iv) Any person who has been declared as such by an order of the court or Authority;

(s) "Local authority" includes a town planning authority (by whatever name called) set up under any Law for the time being in force, a Panchayat as defined in article 243 and a Municipality as defined in article 243P, of the Constitution;

(t) "Marginal farmer" means a cultivator with an un-irrigated land holding up to one hectare or irrigated land holding up to one-half hectare;

(u) "Market value" means the value of land determined in accordance with section 26;

(v) "Notification" means a notification published in the Gazette of lndia or, as the case may be, the Gazette of a State and the expression "notify" shall be construed accordingly;

(w) "Patta" shall have the same meaning as assigned to it in the relevant Central or Slate Acts or rules or regulations made thereunder; (x) "person interested" means-

(i) All persons claiming an interest in compensation to be made on account of the acquisition of land under this Act;

(ii) The Scheduled Tribes and other traditional forest dwellers, who have lost any forest rights recognized under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006;

(iii) a person interested in an easement affecting the land;

(iv) persons having tenancy rights under the relevant State laws including share-croppers by whatever name they may be called; and

(v) any person whose primary source of livelihood is likely to be adversely affected;

(x) "prescribed" means prescribed by rules made under this Act;

(y) "project" means a project for which land is being acquired, irrespective of the number of persons affected;

(Ya) "Public purpose" means the activities specified under sub-section (l) of section 2;

(Yb) "Requiring Body" means a company, a body corporate, an institution, or any other organization or person for whom land is to be acquired by the appropriate Government, and includes the appropriate Government, if the acquisition of land is for such Government either for its own use or for subsequent transfer of such land is for public purpose to a company, body corporate, an institution, or any other organization, as the case may be, under lease, license or through any other mode of transfer of land;

(zc) "Resettlement Area" means an area where the affected families who have been displaced as a result of land acquisition are resettled by the appropriate Government;

(zd) "Scheduled Areas, means the Scheduled Areas as defined in section 2 of the Provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996;

(ze) "small farmer" means a cultivator with an un-irrigated land holding up to two hectares or with an

Irrigated land holding up to one hectare, but more than the holding of a marginal farmer.

10.5.4 Compensation For Land Owners

The land acquisition process u/s 11 of RFCTLARRA2013, has to be started for all villages invoved in land acquisition. The project proponent has neither yet acquired the land by negotiation nor initiated any land acquisition process for complete private land in respect of villages, under section 11 of the said Land Acquisition Act. All provisions of the RFCTLARRA, 2013 related to the determination of compensation shall apply. The project proponent shall have to move to the appropriate government along with the details for the land to be acquired for causing publication of preliminary notification as warranted under Chapter 4 (Section 11) of the Act. After hearing of the objection under Section 15. The administrator for Rehabilitation and Resettlement shall prepare a draft Rehabilitation & Resettlement Scheme for the review of the Commissioner Rehabilitation.

The Collector based on the following criteria shall determine the market value of land:

a. The market value, if any, specified in the India Stamp Act, 1899 (2 of 1899) for the registration of sale deeds or agreements to sell as the case may be, in the area, where the land is situated; or
b. The average sale price for similar type of land situated in the nearest village or nearest vicinity area; or
c. Consented amount of compensation as agreed upon under sub-section (2) of section 2 in case of acquisition of lands for private companies or for public private partnership projects, whichever is higher:

Provided that the date of determination of market value shall be the date on which the notification has been issued under section 11.

The market value shall be calculated as per above shall be multiplied by a factor to be specified in first schedule.

The First Schedule

[See section 31(2)]

The following components shall constitute the minimum compensation package to be given to those whose land is acquired and to tenants referred to in clause (c) of Section 3 in a proportion to be decided by the appropriate Government.

S.N.	Component of compensation package in respect of land acquired under the Act	Manner of determination of value
1	Market value of land	To be determined as provided under section 26.
2	Factor by which the market value is to be multiplied in the case of rural areas	1.00 (one) to 2.00 (Two) based on the distance of project from urban area, as may be notified by the appropriate Government
3	Factor by which the market value is to be multiplied in the case of urban areas	1 (One)
4	Value of assets attached to land or building	To be determined as provided under section 29
5	Solatium	Equivalent to one hundred per cent of the market value of land mentioned against serial number 1 multiplied by the factor specified against serial number 2 for rural areas pot serial number 3 for urban areas plus value of assets attached to land or building against serial number 4 under column (2)
6	Final award in rural areas	Market value of land mentioned against serial number 1 multiplied by the factor specified against serial number 2 plus value of assets attached to land or building mentioned against serial number 4 under column (2) plus solatium mentioned against serial number 5 under column (2).
7	Final award in urban areas	Market value of land mentioned against serial number 1 multiplied by the factor specified against serial number 3 plus value of assets attached to land or building mentioned against serial number 4 under column (2) plus solatium mentioned against serial number 5 under column (2).
8	Other component, if any, to be included	

10.5.5 Elements of Rehabilitation and Resettlement Entitlement For Affected Families

Under Chapter V Section 31, the collector has been empowered to pass the Rehabilitation and Resettlement award for each affected family in terms of entitlement provided in the Second Schedule.

The Second Schedule

[See section 31(2)]

Elements of Rehabilitation and Resettlement entitlements for all the affected families (both land owners and the families whose livelihood is primarily dependent on land acquired) in addition to those provided in the first schedule.

S.N.	Elements of Rehabilitation and Resettlement Entitlements	Entitlement/ provision
1.	Provisions of housing units in case of displacement	If a house is lost in rural areas, a constructed house shall be provided as per the Indira Awas Yojana specifications. If a house is lost in urban areas, a constructed house shall be provided, which will be not less than 50 sq. m in plinth area. The benefits listed above shall also be extended to any affected family which is without homestead land and which has been residing in the area continuously for a period of not less than three years preceding the date of notification of the affected area and which has

S.N.	Elements of Rehabilitation and Resettlement Entitlements	Entitlement/ provision
		been involuntarily displaced from such area: Provided that any such family in urban areas which opts not to take the house offered, shall get a onetime financial assistance for house construction, which shall not be less than one lakh fifty thousand rupees: Provided further that if any affected family in rural areas so prefers, the equivalent cost of the house may be offered in lieu of the constructed house: Provided also that no family affected by acquisition shall be given more than one house under the provisions of this Act. Explanation- The houses in urban areas may, if necessary, be provided in multi-storied building complexes.
2.	Land for Land	In the case of irrigation project, as far as possible and in lieu of compensation to be paid for the land acquired, each affected family owning agricultural land in the affected area and whose land has been acquired or lost, or who has, as a consequence of the acquisition or loss of land, been reduced to the status of a marginal farmer or landless, shall be allotted, in the name of each person included in the records of rights with regard to the affected family, a minimum of one acre of land in the command area of the project for which the land is acquired: Provided that in every project those persons losing land and belonging to the Scheduled Castes or the Scheduled Tribes will be provided land equivalent to land acquired or two and a one-half acre, whichever is lower.
3	Offer for Developed Land	In case the land is acquired for urbanization purposes, twenty per cent of the developed land will be reserved and offered to land owning project affected families, in proportion to the area of their land acquired and at a price equal to the cost of acquisition and the cost of development. Provided that in case the land-owning project affected family wishes to avail of this offer, an equivalent amount will be deducted from the land acquisition compensation package payable to it.
4	Choice of Annuity or Employment	The appropriate Government shall ensure that the affected families are provided with the following options: (a) Where jobs are created through the project, after providing suitable training and skill development in the required field, make provision for employment at a rate not lower than the minim um wages provided for in any other law for the time being in force, to at least one member per affected family in the project or arrange for a job in such other project as may be required; or (b) One-time payment of 5 lakh rupees per affected family; or (c) Annuity policies that shall pay not less than 2000 rupees per month per family for 20 years, with appropriate indexation to the consumer price index for agricultural laborer's
5	Subsistence grant for displaced	Each affected family, which is displacing from the land acquired shall be given a monthly subsistence allowance equivalent to 3000 rupees

S.N.	Elements of Rehabilitation and Resettlement Entitlements	Entitlement/ provision
	families for a period of one year	per month for a period of one year from the date of award. In addition to this amount, the schedule castes and the scheduled tribes displaced from scheduled areas shall receive and amount equivalent to 50000 rupees. In cases of displacement from the scheduled areas, as far as possible, the affected families shall be relocated in a similar ecological zone, to preserve the economic opportunities, language, culture and community life of the tribal com munities.
6	Transportation cost for displace families	Each affected family which is displaced shall g et a one-time financial assistance of 50000 rupees as transportation cost for shifting of the family, building materials, belonging s and cattle.
7	Cattle shed / Petty shops cost	Each affected family having cattle or having a petty shop shall get one-time financial assistance of such amount as the appropriate Government m ay, by notification, specify subject to a minimum of 25000 rupees for construction of cattle shed or petty shop as the case may be.
8	One-time grant to artisan, small traders and certain others	Each affected family of an artisan, small traders or self-employed person or an affected family which owned non-agricultural land or commercial, industrial or institutional structure in the affected area, and which has been involuntarily displaced from the affected area due to land acquisition, shall get one-time assistance of such amount as the appropriate Government may, by notification, specify subject to a minimum of 25000 rupees
9	Fishing rights	In cases of irrigation or hydel projects, the affected families may be allowed fishing rights in the reservoirs, in such manner as may be prescribed by the appropriate Government
10	One-time Resettlement Allowance	Each affected family shall be given a onetime “Resettlement Allowance” of 50000 rupees only
11	Stamp duty and registration fee	(1) The stamp duty and other fees payable for registration of the land or house allotted to the affected families shall be borne by the Requiring Body. (2) The land for house allotted to the affected families shall be free from all encumbrances. (3) The land or house allotted may be in the joint names of wife and husband of the affected family.

10.5.5.1 Compensation for Houses and Other Properties

Phase-I

Due to submergence under various reservoir displacement of people has been involved. The houses and other assets of PDF shall be also acquired for which they have to be compensated as per Government orders and Rules. The details of assets are elucidated in **Table 10.17.**

Table 10.17: Compensation due to Acquisition of Properties

S.No	Name of the Village	No of PDF	House Structures payment made in Crore	Poultry Shed payment in Crore	Open Areas payment in Crore	Total Payment made in Crore
A	**Anjanagiri reservoir (Package-02)**					

(i)	Duliya Naik Thanda	4	-0	0	0	0
(ii)	Anjanagiri Thanda	65	4.33	0	0	4.33
(iii)	Sunnapu Thanda	26	4.03	0	0	4.03
(iv)	Vadde Gudiselu	13	1.51	0	0	1.51
(v)	Bodabanda Thanda	9	0.15	0	0	0.15
B	**Veeranjaneya Reservoir (Package-06)**					0
(i)	Bandaravipakula	978	77.01	0	0	77.01
(ii)	Konkalapally	321	13.81	0	0	13.81
C	**Venkatadri Reservoir (Package-09,10,11)**					
(i)	G.Gutta Thanda H/o Pothireddypalli village	58	1.89	0.83	3.39	6.11
(ii)	Ram Reddy Palli Thanda	45	1.38	0.00	0.91	2.29
(iii)	Karukonda Thanda	213	4.56	0.00	6.82	11.38
(iv)	Anekhanpally Thanda	116	3.42	0.18	4.71	8.31
(v)	Anekhanpally Village	34	0.87	0.00	0.97	1.84
D	**Kurumurthyraya Reservoir (Package-13,14,15)**					
(i)	Bhattupally Thanda	142	2.40	0.00	0.00	2.40
(ii)	Chinthagattu Thanda	45	0.82	0.00	0.00	0.82
(iii)	Old Chinthagattu Thanda	47	0.18	0.00	0.00	0.18
(iv)	Ekulagutta Thanda	84	1.44	0.00	0.00	1.44
(v)	Borangattu Thanda	89	2.14	0.00	0.00	2.14
E	**Udandapur Reservoir (Package-17&18)**					
(i)	Udandapur & Vallur Village and its hamlets	2850	28.69	0.00	59.00	87.69
Total Phase-I		**5139**	**148.63**	**1.01**	**75.8**	**225.44**

Phase-II

The main canals have been aligned in such a manner that the acquisition of structures have been avoided. The survey for distribution system is under progress. The compensation for a housing unit if encountered along alignment shall be determined as substitution/replacement cost based on the rates prescribed for “kutcha” units with earthen tiled roof, with sheeted roof as determined by PWD without consideration of any depreciation on cost. A lump sum provision of Rs 1200 lakh has been earmarked on this count. Besides housing units, wells (190) and Fruit bearing trees (4000) and non-fruit bearing trees (2000) shall also be acquired for which budgetary provision has been made in **Table 10.18.**

Table 10.18: Compensation due to Acquisition of Properties

S.N.	Particular	Quantity	Unit	Rate (Rs lakh)	Amount (Rs lakh)
1	Compensation for houses of	Lump Sum provision			1200.00
2	Compensation for Government buildings	-	-	-	0.00
3	Wells	190	No.	0.30	57.00
4	Trees (Fruit bearing)	4000	No.	3000	120.00
	Trees (Non-fruit bearing)	2000	No.	2500	100.00
5	Relocation of road under submergence	-			0.00
6	Shifting of electrical poles	-			0.00

Total	**1477.00**

10.5.5.2 Land Acquisition

Phase-I

Under Phase-I the requirement of (Patta land) has been estimated as 12277.46 ha of which about 10524.38 ha has already been acquired at different times under different norms of land compensation and rates of land applicable at the time of acquisition. Now balance land to be acquired is 1753.08 ha. Based on expenditure incurred on acquired land and the estimated amount for balance land to be acquired the total cost for acquisition of land including assets attached to it with 100% solatium cost is shown in **Table10.19.**

Table 10.19: Cost of Acquisition of Patta land for Phase-I and its Status

S.N.	Particular	Area (ha)	Cost (in Rs Crore)
1	Total Patta land to be acquired	12277.46	2541.44
2	Total Patta land acquired	10524.38	1554.44
3	Balance Patta land to be acquired	1753.08	987.00

Phase-II

For Phase-II works, which are yet to be undertaken, district wise land acquisition cost in respect of wet (irrigated) and dry (un-irrigated) land as per average of the collector's rate, has been worked out in **Table 10.20.** Reference land acquisition details are encased as **ANNEXURE VIII**

Table 10.20: Land Acquisition and its cost

S.N.	Village/Type of land	Quantity	Unit	Collector's Rate, (Rs lakh)	Amount (Rs lakh)
1	**Mahabubnagar**				
	Wet (Irrigated)	520	ha	5.18	2693.6
	Dry (Unirrigated)	2911	ha	2.47	7190.17
2	**Narayanpet**				
	Wet (Irrigated)	160	ha	5.18	828.80
	Dry (Unirrigated)	891	ha	2.47	2200.77
3	**Vikarbad**				
	Wet (Irrigated)	458	ha	5.18	2372.44
	Dry (Unirrigated)	2843	ha	2.47	7022.21
4	**Nagarkurnool**				
	Wet (Irrigated)	215	ha	5.18	1113.7
	Dry (Unirrigated)	1215	ha	2.47	3001.05
5	**Rangareddy**				
	Wet (Irrigated)	600	ha	5.18	3108
	Dry (Unirrigated)	3079	ha	2.47	7605.13
6	**Nalgonda**				
	Wet (Irrigated)	30	ha	5.18	155.40
	Dry (Unirrigated)	170	ha	2.47	419.9
Total		**13092**			**37711.17**

Component of compensation package in respect of land acquired under the Act as contained in First Schedule is tabulated in **Table 10.21.**

Table 10.21: Compensation for Land Acquisition

S.N.	Component of compensation package as per Act,2013	Quantity	Unit	Rate	Amount (Rs lakh)
1	Market value of land as per collector' rate (Table5.4)	13092	ha	-	**37711.17**
2	Factor by which the market value is to be multiplied in the case of rural areas			1.50 Times	56566.75
3	Factor by which the market value is to be multiplied in the case of urban areas	Not Applicable	-	-	0.00
4	Value of assets attached to land or building (as per Table 5.3)	-	-	-	1477.00
5	Solatium @ 100% of sum of S.N.2 and S, N.4		Rs	100%	58043.75
6	Final award in rural areas sum of S.N.2,4 and 5	-	-	-	116087.5
7	Final award in urban areas	Not Applicable	-	-	0.00
8	Interest for 24 months on compensation @12% as per section 23 of Land Acquisition Act,2013	116087.5	Rs	12%/yr	27861.00
9	Crop Compensation for standing crop (30%)	3968	ha	15000	595.20
10	Service Charges (6.5% cost of total Compensation i.e., S.N.6 and 8	143948.50	Rs lakh	6.5%	9356.65
11	Legal Charges (0.5% cost of total Compensation i.e., S.N.6 and 8	143948.50	Rs lakh	0.5%	719.74
12	Demarcation of Land (1% of land Compensation)	37711.17	Rs lakh	1%	377.11
Total (S.N.6+S.N.8+S.N.9+S.N.10+S.N.11**+** S.N.12)					**154997.2**

Thus, total land acquisition cost for the entire project shall be Rs 4091.41 crores against which an expenditure of Rs 1554.44 crores have been incurred.

10.5.6 Budget For R&R Benefits

Phase I

Under Phase-I, six reservoirs shall be constructed. Out of six reservoirs one reservoir viz., K.P Lakshmidevipally does not required any displacement and therefore, no R&R elements are involved for it. For rest five reservoirs submergence area involves displacement of about 5139 persons. R&R benefits to the tune of Rs15336 lakh have already been paid to 2289 PDF of 4 reservoirs viz., Anjanagiri, Veeranjaneya, Venkatadri and Kurumurthyraya. Now it is only to be

paid in case of 2850 PDF related to submergence area of Udandapur Reservoir for which a sum of Rs 36620 lakh has been worked out (**Table 10.22**).

Table 10.22: Budget for Various R&R Benefits Under Phase-I

S.N.	Name of the Village	Mandal	No of PDF	R&R Amount Paid in lakh
A	**Anjanagiri reservoir (Package-02)**			
(i)	Duliya Naik Thanda	Kollapur	4	91
(ii)	Anjanagiri Thanda	Kollapur	65	876
(iii)	Sunnapu Thanda	Kollapur	26	413
(iv)	Vadde Gudiselu	Kollapur	13	151
(v)	Bodabanda Thanda	Kollapur	9	121
B	**Veeranjaneya Reservoir (Package-06)**			0
(i)	Bandaravipakula	Revally	978	1660
(ii)	Konkalapally	Revally	321	1977
C	**Venkatadri Reservoir (Package-09,10,11)**			0
(i)	G.Gutta Thanda H/o Pothireddypalli village	Thimajipate	58	652
(ii)	Ram Reddy Palli Thanda	Bijnepally	45	488
(iii)	Karukonda Thanda	Bijnepally	213	2444
(iv)	Anekhanpally Thanda	Bijnepally	116	1318
(v)	Anekhanpally Village	Bijnepally	34	418
D	**Kurumurthyraya Reservoir (Package-13,14,15)**			0
(i)	Bhattupally Thanda	Bhoothpur	142	1658
(ii)	Chinthagattu Thanda	Thimmajipet	45	538
(iii)	Old Chinthagattu Thanda	Thimmajipet	47	442
(iv)	Ekulagutta Thanda	Bhoothpur	84	1021
(v)	Borangattu Thanda	Bhoothpur	89	1068
E	**Udandapur Reservoir (Package-17&18)**			0
(i)	Udandapur & Vallur Village and its hamlets	Jadcherla	2850	36620
Total Phase-I			**5139**	**51956**

Phase II

Final Budget for R&R benefits shall be prepared after completion of social survey for assessment of the exact numbers of project affected families losing houses, shops, well, cattle sheds, etc. However, tentative provision has been made on the basis of the elements of rehabilitation and resettlement entitlement as elaborated in Second Schedule as shown in **Table 10.23.**

Table 10.23: Budget for Various R&R Benefits Under Phase-II

Clause No.	Provision as per "New LA, R&R Act, 2013"	No. of Eligible nuclear families / persons	Rate as per Act/Notification	Cost (in Rs lakh.)
Phase-II				
1	Provisions of housing units in case of displacement (equivalent to a house as per the two-bed room housing policy of the State Government).	100	Rs 5,04,000	504.00
2	Provisions of housing units in case of displacement (in rural areas as per Prime Minister Awas Yojana	25	Rs 132000	33.00

Clause No.	Provision as per "New LA, R&R Act, 2013"	No. of Eligible nuclear families / persons	Rate as per Act/Notification	Cost (in Rs lakh.)
	specifications).			
2	Land for land (@1.0 ha/PAF of SC/ST category)	50	Rs 5,00,000	250.00
3	Choice of Annuity or employment	100	Rs. 5 lakhs per affected family (Option b)	500.00
4	Subsistence grant for displaced families for a period of one year	125	Rs. 40000 .00 per family for one year from date of award + Rs. 60000/- in addition to the above amount i.e., 100000 per person for S.C. and S.T. (50)	80.00
5	Transportation Cost for displaced families (provision made @ Rs 60,000 per affected family. (As per G.O.Ms.No.120 of Govt. of Telangana)	125	Rs. 60000	75.00
6	Cattle shed / petty shops cost	200	Rs. 25000	50.00
7	One-time grant to artisan, small traders and certain others	200	Rs 30000	60.00
8	One – time Resettlement Allowance	125	Rs. 60000	75.00
Total				**1627.00**

10.5.7 Infrastructure Facility

Under Phase -I, infra structure facilities have been proposed at three locations for resettlement of PDF. The works have been undergoing as per sanctioned estimates detailed in **Table 10.24.** Under phase-II, the canal shall be covered in five district and the number of person likely to be displaced due to acquisition of house is very less and scattered and in the wake of the fact, that PDFs have preferably desired to be rehabilitated in the same location in the command area, no resettlement colony shall be required.

Table 10.24: Budget for Infra- structure Development in R&R Colony

S.N.	R&R Colony	Sanctioned Amount (Rs lakh)	Amount Spent (Rs lakh)	Balance Amount (Rs lakh)
Phase-I				
1	Anjanagiri reservoir	447.00	0.00	447.00
2	Veeranjaneya Reservoir	0.00	0.00	0.00
(i)	Konkanapally	1660	567	1093
(ii)	Bandaravipakula	3917	2088	1829
3	Venkatadri Reservoir	2343	1774	569
4	Udandapur Reservoir			
(i)	Udandapur	17125	2000	15155
(ii)	Vallur			
Total		25492	6429	19093
Phase-II		0.00	0.00	0.00

Total Phase-I&II	25492	6429	19093

10.5.8 Compensation Disbursement

All the compensation related to land, property, infrastructure development should be made transparent for which a suitable mechanism may be worked out in consultation with district administration and preferably all the payments should be made through bank drafts.

10.5.9 Dispute Redressal Mechanism

For ensuring the implementation of rehabilitation and resettlement scheme and compliance under the agreed policy, during the implementation of the scheme and thereafter monitoring and evaluation shall be carried out by departmental and monitoring committee. The appropriate Govt., for implementing the rehabilitation and resettlement scheme and monitoring and review of the progress thereof and conducting social audit by Rehabilitation & Resettlement Administration, where it has been so designated and where it has not been designated, in that scenario, shall constitute a committee to be called as resettlement & rehabilitation committee under Chairmanship of a Senior Government Officer.

The Resettlement & Rehabilitation Committee constituted as above besides the officers of P. Govt. shall inter-alia include as one of its members:

a) A representative of women residing in the affected zone;
b) A representative, each from of the Scheduled Castes and Scheduled Tribes residing in the affected zone;
c) A representative from a voluntary organization;
d) A representative of the lead bank.
e) A representative of the land acquisition officer;
f) Chairman or his nominee from Panchayat Raj Institutions located in the affected zone
g) MPs/MLAs of the area included in the affected zone.
h) Representative for Project Proponent.

10.5.10 Appointment of Ombudsman

For Timely Redressal of Grievances/Complaints touching and arising within the framework of this policy, the Govt. of Telangana. shall appoint an ombudsman.

10.5.11 Summary of Cost

The cost because of implementing Rehabilitation and Resettlement Plan, cost of land acquisition and the cost of infra-structure works out to **Rs 488216.00 lakh.**

Table 10.25: Total Cost under R&R Plan& Infra- structure Works

S.N.	Particular	Amount (Rs lakh)
Phase-I		
1	Cost of land acquisition	254144.00

S.N.	Particular	Amount (Rs lakh)
2	R&R Grants	51956.00
3	Cost of Infra-Structure Development in R&R site	25492.00
Total Phase-I		**331592.00**
Phase-II		
1	Cost of land acquisition	154997.00
2	R&R Grants	1627.00
3	Cost of Infra-Structure Development in R&R site	0.00
Total Phase-II		**156624.00**
Total Phase-I &II		**488216.00**

10.6 GREEN BELT DEVELOPMENT

10.6.1 Introduction

While improving the aesthetic of the area the greenbelt though functioning as pollutant sinks while scavenging pollutants, also incidentally help in developing habitats for birds and animals. The plants in their function as scavenger of pollutants are also prone to suffer toxicity of air pollutants like any other living organism. In order to mitigate and minimize environmental impacts from air pollution, noise pollution, soil erosion etc. arising due to construction of project, greenbelt development around the project sites is a good option. Green canopy not only absorbs some of these pollutants but also improves the environment. Therefore, a "Green Belt Development Plan" by using the local species has been proposed around the project area, colonies and the project roads. Local species are economically important, soil binding in nature and can thrive well under local conditions. Such species shall be planted to maintain species diversity, rational utilization of nutrients and also to maintain health of the trees and comply with the CPCB Guidelines (CPCB (2000) Guidelines for Development of Greenbelts Published by CPCB, Delhi).

10.6.1.1 Development of Greenbelt

The green belt is proposed to be developed within the project area along both banks of main canal, service roads of distribution network and project colonies. Along the main canal banks plantation will be done on both sides where ever feasible. Plantation shall be done along service roads of distributaries. Plantation along roads must consider visibility aspects on curves so as to ensure safe driving. Plantation around the office complexes and residential colonies is proposed to be done so that greenery is developed and aesthetic is improved. Precaution should be exercised by not planting large size trees around buildings and other similar structures as during winter the sun rays are obstructed by them invariably and much wanted sunshine is impaired. The layout of green belt along banks of main canal is shown in **Figure 10.7**.

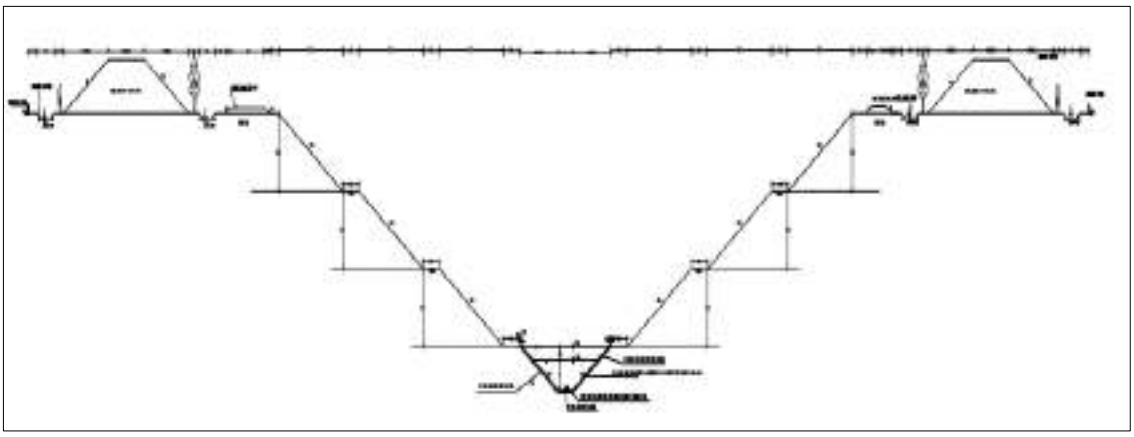


Figure 10.7: Layout plan of Green Belt Development Along Canal Bank

10.6.1.2 Strategy for Greenbelt

The strategy worked out for development of green belt consists of the following:

- The species selected should be capable of growing fast,
- The species should be wind firm and long lived.
- Broad leaf trees growing above 10 m in height should be planted along the roads, offices and infrastructure facilities.
- The species should form a dense crown cover.
- The species should form a litter in abundance on the plantation flow.
- Generally local/indigenous fast-growing trees shrubs should be planted.
- The trees should be protected by plantation of non-palatable shrub species to avoid browsing by animals.
- Placement of tree guards (metal tree guard, pre-fab RCC tree guard, Fiber tree guard etc.), should be provided to save avenue plantation.
- For protection against biotic interference thorn fencing around the plantation, circular trench around the planting pit and sown with fast growing thorny shrubs on the ridge should be followed.

10.6.1.3 Guidelines and Techniques for Green Belt Development

Extensive survey in the project area was undertaken to observe the vegetation types and its density. Soil characteristics were also kept in mind. Based on the survey and environmental conditions suitable plant species have been proposed for green belt development. To meet the requirement of saplings for development of green belt, a temporary nursery with following details is suggested:

10.6.1.4 Size of Nursery

The size of nursery depends upon the number and type of seedlings to be produced. To produce 14.82 lakh plants a nursery of about 15 ha area would be required.

10.6.1.5 Nursery Site Selection

A well-drained site near the areas where plantation is to be carried out is always preferred. Light shading site for the nursery is important for the protection of the young seedlings against sun,

frost, hailstorms or heavy rains. Sites, which are prone to water logging, should not be selected and sites shall be selected in consultation with Forest Department preferably near the existing one. In the present case, the nearby forest nursery is proposed to meet and the demand of trees under the green belt development plan.

10.6.1.6 Transportation

The nursery should be readily accessible all the year round in order to facilitate transportation of materials required in the nursery and dispatch of seedlings from the nursery.

10.6.1.7 Fertilizer Application

The organic fertilizer produced through domestic organic waste coupled with vermin compost can be utilized for the nursery. Farmyard manure (FYM) can also be used but chemical fertilizer should be avoided. The compost / vermin compost proposed to be developed through solid waste management.

10.6.1.8 Soil and Soil Fertility

The best site for raising the nursery is the area, which has got a thick layer of humus. The fertile and well-drained soil with sandy loam to loamy texture, pH varying from 5.5-7.5 should always the preferred for nursery sites.

10.6.1.9 Water Supply and Drainage

The site should have perennial water supply. The drainage of soil has important bearing on the health of seedlings.

10.6.1.10 Species to be Planted

The choice of plant species for plantation in greenbelt is mainly governed by the natural factors of bio-climate of the area. For efficacious removal of pollutants (gasses / fugitive dust), It is essential that the plants developed in conditions confirming to adequate supply of nutrition for their growth, availability of water to avoid water stress i.e., to maintain openness of stomatal apertures and form of epidermal structures. Besides, the adequate exposure to sunlight and wind i.e., without hindrance to free flow of air. In the project area, pollutants like SO2 and NOx shall result from the operation of construction/excavation machinery and movement of vehicles besides particulate matter mostly PM10 shall result as fugitive dust emission from movement of vehicles on Kutcha Haul roads and as primary source from quarrying activities. It is suggested that spreading / round canopy shaped trees should be planted nearby the construction site like stone crushers / excavation sites and oblong and conical trees along the roadside. For absorption of gases pollutants, it is necessary to plant such trees, which have tolerance towards pollutants at reasonable concentration; have longer foliage period and freely exposed foliage besides large number of stomata apertures. For removal of suspended particulate matter high trees with good spread of crown with leaves firmly supported on petioles and abundance of surface area on bark and foliage should be planted. As per bio-climatic zone of India, the study area lies in Western Himalayan region in valley temperate sub-zone. A list of indigenous trees found suitable after identification of species for raising in the nursery and for development of green belt around the project area is given in **Table 10.26.**

Table 10.26: Suggested Plant Species for Green Belt Development

S.N.	Botanical name	Local name
Trees		
1	*Aegle marmelos*	Maredu, Bilvamu, Tripathra
2	*Azadirachta indica*	Vepa, Nimba
3	*Butea monosperma*	Moduga, Palasa, Kimsukamu
4	*Madhuca longifolia var. latifolia*	Ippa, Pedda ippa
5	*Pithecellobium dulce*	Seemachintha
6	*Syzygium cumini*	Neredu, Allaneredu
7	*Ficus benghalensis*	Marri, Peddamarri
8	*Tectona grandis*	Teku
9	*Bambusa bambos*	Veduru, Bongu veduru
10	*Mangifera indica*	Mamidi
11	*Holoptelea integrifolia*	Nemalinara
12	*Ficus religiosa*	Raavichettu
13	*Ficus racemosa*	Medi, Atthipandu
14	*Manilkara hexandra*	Palachettu
15	*Terminalia arjuna*	Tellamaddhi, Vegamaddhi, Titttumaddhi
16	*Acacia nilotica*	Nallathumma, Nallathumma, Babbula
17	*Dalbergia sissoo*	Sinsupa, Iridi, Sissoo
18	*Cassia fistula*	Rela

Some important precautions should be taken during the plantation, which are as under:

- Open grazing is practiced in general in the area; therefore, protection should be provided in advance.
- Polyculture should be practiced. Mixture by group should be preferred over intimate mixture.
- Species mentioned should be planted in sufficient numbers so as to increase their population size in the area.
- Multipurpose species should be planted in large numbers, so as to provide direct benefit to people living around.

10.6.2 Green Belt Development

In order to raise the green belt around project areas and other components the total requirement of different species of plants/ saplings shall be worked out. Since the green belt is to be created over a period of three years the maintenance for a period of three years of nursery and plantation works will be required. The beating up of mortality may be done with the plant stocks proposed to be generated in the nursery over the complete duration of the plan.

10.6.2.1 Canal Bank Plantation

Cost of the plantation has been calculated as per the existing schedule of rate, material cost (plants, FYM, tree guard, etc.) and the total area of treatment. One row each for tree, shrub and bio-fencing has been proposed with a spacing of 3.3 m x 3.3 m for trees and 2 m x 2 m for shrubs (to take care of the mortality in the next season). The pit size has been recommended as

45 x 45 x 45 cm for trees and 30 x 30 x 30 cm for shrubs.

10.6.2.2 Green Belt Around Residential Area

Plantation around the office complexes is proposed to be done so that greenery is developed. Precaution should be exercised by not planting large size trees around buildings and other similar structures as during winter the sun rays are obstructed by them invariably and much wanted sunshine is impaired. Besides this, it is also proposed to develop green belt around the working areas for trapping the dust and noise. Plantation of avenue, ornamental and fruit trees is proposed in these areas along with the periphery area around residential complex.

10.6.2.3 Cost Estimate of Green Belt Development

Table 10.27: Summary of Cost for Green Belt Development

S. N.	Reservoir	Canal	District	Length (km)	Number of Trees	Cost (Rs lakh)
Phase-I						
1	Anjanagiri	OC	Nagarkurnool	2.205	1764	3.53
2	Veeranjaneya	OC	Nagarkurnool	8.575	6860	13.72
3	Venkatadri	OC	Nagarkurnool	6.4	5120	10.24
4	Kurumurthiyraya	OC	Mahabubnagar	12.05	9640	19.28
5	Udandapur	OC	Mahabubnagar	1.435	1148	2.30
6	K.P Lakshmidevipally	OC	Ranga Reddy	19.825	15860	31.72
Total Phase-I				**50.49**	**40392**	**80.78**
					Say	**81.00**
Phase-II						
1	Venkatadri	VMC	Nagarkurnool	84	67200	134.4
			Mahabubnagar	35	28000	56
			Ranga Reddy	33	26400	52.8
			Nalgonda	0	0	0
		LLC	Nagarkurnool	19.3	16000	32
			Mahabubnagar	10.3	8000	16
2	Kurumurthyraya	HLC	Mahabubnagar	108	86400	172.8
		LLC	Mahabubnagar	36	28800	57.6
3	Udandapur	SMC	Mahabubnagar	17.5	13600	27.2
			Nagarkurnool	7.5	5600	11.2
		RMC-1R	Mahabubnagar	4.6	4000	8
		RMC-2R	Mahabubnagar	13	10400	20.8
			Ranga Reddy	59	47200	94.4
			Nagarkurnool	0	0	0
		LMC	Vikarabad	133	106400	212.8
			Mahabubnagar	4.73	4000	8
		Maddur	Mahabubnagar	40	32000	64
			Vikarabad	73.2	58400	116.8
		Hanwada	Mahabubnagar	15	12000	24
			Vikarabad	7.74	6400	12.8
4	K.P. Laxmidevipally	EMC	Vikarabad	1	800	1.6
			Ranga Reddy	105	84000	168
			Mahabubnagar	0	0	0
			Nalgonda	0	0	0

		NMC	Vikarabad	89	78400	156.8
			Ranga Reddy	0	0	0
		SMC	Vikarabad	0.6	800	1.6
			Ranga Reddy	19	15200	30.4
			Mahabubnagar	0	0	0
5	Distribution			3700	740000	1480
6	Colony				2000	4.00
Total Phase-II					**1482000**	**2964**
Grand Total Phase &II					**1522392**	**3045**

10.7 RESERVOIR RIM TREATMENT PLAN

10.7.1 Introduction

Under Phase-I, the project involves construction of six balancing reservoirs viz., Anjanagiri, Veeranjaneya, Venkatadri, Kurumurthyraya, Udandapur and K. P. Lakshmidevipally, for storing water pumped in five stages from foreshore of Srisailam reservoir.Therefore, reservoir rim treatment plan is required to be formulated and implemented in case of Phase-I works. In the wake of the fact that no reservoir is proposed under Phase -II as it merely includes the work of construction of main canal and distribution system, the Reservoir Rim Treatment Plan is not warranted

10.7.2 Plantation Around Reservoir in Un-Bunded Portion

Six reservoirs of gross bund length of 74.652 km shall be created of which net bund length shall be 63.859 km, balance (10.793 km) being the length of such portions of un-bunded lengths where the naturally higher ground level exists like natural hillocks. Reservoir wise description is detailed in **Table 10.28**.

Table 10.28: Length of Un-bunded Portion OF Reservoirs

Name of the Reservoir	Gross Bund Length	Net Bund Length	Un-bunded length
Anjanagiri	11.022	6.77	4.252
Veeranjaneya	12.4	7.525	4.875
Venkatadri	15.23	14.754	0.476
Karvena	14.125	13.185	0.94
Udandapur	15.825	15.575	0.25
K.P.Laksmidevipalle	6.05	6.05	0
Total	**74.652**	**63.859**	**10.793**

The plantation on the un-bunded length of reservoir will ensure protection of the reservoir rim area from any minor slips triggered due to fluctuation in the water level. Such plantation around the reservoir periphery at un-bunded lengths would control of erosion of soil and prevention of land slips from the banks surrounding it. In such reaches 30m wide green belt has been proposed on the slope immediately above the reservoir. Indigenous, economically important,

soil binding tree species, which are able to thrive well under high humidity and flood conditions, will be planted. The cost of plantation in combined reservoirs rim area of 32.4 ha with 2500 trees /ha @ Rs 6.00/lakh/ha works out to Rs 194.40 lakh.

10.7.3 Treatment Measures for Land Slide Prone Zone

There are no active or dormant landslide/landslip zones in the un-bunded portion of reservoirs besides other categories of mass movement. Therefore, no treatment measures are proposed.

10.7.4 Gully Control Measures

Gullies are mainly formed on account of physiographic, soil type, and heavy biotic interference in an area. The scouring of streams at their peak flows and sediment-laden run-off cause gullies. The gullies would be required to be treated with engineering/mechanical as well as vegetative methods. Check dams would be constructed in some of the areas to promote growth of vegetation that will consequently lead to the stabilization of slopes/area and prevention of further deepening of gullies and erosion. Different types of check dams would be required for different conditions comprising of different materials depending upon the site conditions and the easy availability of material (stones) at local level and transport accessibility. Generally, brush wood check dams and dry random stone masonry check dam are recommended to control the erosion in the first order streams and for second order streams gabion structure are provided.

10.7.5 Cost Estimate

The cost estimate for works under the plan for Phase-I are provided in **Table10.29**. Under Phase-II, no reservoir treatment measures are required.

Table 10.29: Cost Estimate of Reservoir Rim Treatment

S.N.	Item of Work	Qty.	Unit	Rate (Rs.)	Amount (Rs. lakh)
1	Plantation in reservoir rim	32.4	ha	600000	194.40
2	Gully control measures				
a	Brush wood check dams	1000	No.	2000	20.00
b	DRSM check dams	200	No.	25000	50.00
c	Contingency				5.60
				Total	**270.00**

10.8 PLAN FOR RESTORATION & LANDSCAPING OF PROJECT SITES

10.8.1 Landscape and Restoration Plan

The under Phase-II works construction of main canal off taking from reservoir constructed under Phase-I under PRLIS is contemplated and for which terms of reference have been issued. Besides this the construction of distribution system shall be carried out. Although no major change in the land scape shall happen as the canal system is either in cutting, cutting and filling or in

banking. All these works shall be located in remote interior and at a detour from District Headquarter, the construction site provides a limited site for landscaping. Considering this the landscape plan is restrictive in nature being limited canal head sites, residential and office complex areas. It is proposed to provide landscaping for the area around head regulators. The financial provision of landscape works is presented in **Table 10.30**.

Table 10.30: Cost Estimate for Landscaping Plan

S.N.	Particular	Quantity	Amount (Rs. lakh)
Phase-I			
1	Providing ornamental, avenue and flowering plants and flower beds near pump houses	LS	20.00
2	Providing rest benches	LS	5.00
3	Watch and ward 5 chowkidars @8000/month for 30 months	LS	12.00
4	Provision for recurring cost on maintenance of item 1 through 3 @ 2.5% of cost per year for 2 years	LS	1.25
5	Contingencies	LS	0.75
		Sub Total	**39.00**
Phase-II			
1	Providing Channel fencing along approach road to head regulators	LS	15.00
2	Providing ornamental, avenue and flowering plants and flower beds near canal heads	LS	20.00
3	Providing rest benches	LS	5.00
4	Watch and ward 13 chowkidars @8000/month for 30 months	LS	31.20
5	Provision for recurring cost on maintenance of item 1 through 4 @ 2.5% of cost per year for 2 years	LS	3.60
6	Contingencies	LS	1.20
		Sub Total	**76.00**
Grand Total Phase I&II			**115.00**

10.9 FISHERIES MANAGEMENT PLAN

10.9.1 Introduction

The reservoirs invariably offer scope for inland fish production, if managed on scientific lines and for various other kinds of enhancement leading to higher productivity and income generation for the local community. Reservoirs are predominantly capture fisheries system and the management norms are based on the principle of' stock manipulation, adjustment in fishing effort, observance of conservation measure and gear selectivity. In broad terms, management of medium and large reservoirs can be considered more akin to enhanced capture fisheries. Although many of them are stocked, their fisheries continue to depend to a large extent on the wild or naturalized fish stock. The small reservoirs are generally managed as culture- based capture fisheries, akin to extensive aquaculture; where the main accent is on stocking, fattening and harvesting. The key management parameters or culture-based fishery are species selection, stocking and environmental enhancement.

Under Phase-I of projects 6 reservoirs shall be constructed at various elevation and shall be interconnected through water conductor system comprising of approach channels, open canals

and tunnels. The catchment of reservoirs is very small and mainly these shall be filled up to FTL during monsoon season from foreshore of Srisailam reservoir by stages of pumping. Thus, these reservoirs are neither directly connected to natural stream nor are intervention on natural waterbody. The consolidated area of these reservoirs at FTL and MDDL is 8387 ha and 3275 ha respectively (**Table 10.31**). This implies that water shall be available round the year. Therefore, Fisheries management Plan for reservoirs based on the stocking–cum capture fishery technique.

is proposed. The management techniques involve:

- Introduction of selected varieties of carps from extraneous sources, so as to develop a carp dominated fishery through self-propagation as well as regular stocking.
- A rational system of exploitation based on the concept of fishing effort and population dynamics of the fish stock.
- Conservation measures e.g., regulation of mesh size, imposition of size limits, observance of closed season, ban on destructive methods of fishing etc.
- Preservation, transport and marketing of fresh fish.

Table 10.31: Details of Reservoir

S.N.	Reservoir	Location		Gross Capacity (TMC)	Water spread (ha)	
		Village	Mandal		At FTL	At MDDL
1	Anjanagiri	Narlapur	Kollapur	8.51	892	599
2	Veeranjaneya	Yedula	Gopalpet	6.55	1562	900
3	Venkatadri	Vattem	Bijinepally	16.74	1445	947
4	Kurumurthiyraya	Karvena	Bhoothpur	17.34	2291	349
5	Udandapur	Udandapur	Jadcherla	16.03	1697	300
6	K.P Lakshmidevipally	Padmaram	Chowdargudem	2.80	500	181
Total				67.97	8387	3275

10.9.2 Fisheries Management in Man Made Reservoirs

In the state the inland fisheries resources are under the ownership of the Department of Fisheries (DOF) who have the right to allot resources to fishers/Fishermen cooperative Societies and regulate its utilization. The activities of fisheries are being pursued in diverse water bodies of different sizes and varied bio-physical characteristics. Considering the resource base, it is the tanks and reservoirs that form the major focus of fisheries development in the State. Hence, the present fish production, sector growth and development are driven mainly by the ongoing activities in these water bodies.

In pursuit of optimal use of available water bodies for the development of fisheries, formation of Fishermen Cooperatives was encouraged across the State by the Government. Both men and women fishers were organized in to Primary Fishermen Cooperative Societies (PFCS) and provided access rights of water bodies in their surroundings on lease terms for equitable sharing

of the usufructs/fish, better wellbeing and benefit.

In pursuance of DOF policy for sector growth, fishers/societies are also extended with subsidized supply of fishing nets, Boats, mopeds; pick up vans, of late support for cage fish farming etc. The training and capacity building, marketing support etc. are also receiving attention of the DOF in recent years to further strengthen and empower the PFCS in the state.

10.9.2.1 Stocking &Stock Density

The Indian Major Carps Catla, (*Catla catla*) Rohu, (*Labeo rohita*) and Mirgal, (*Cirrhinus mirgala*) are the choice of species as they are reproduced easily in hatcheries. Based on recommendation of National Fisheries Development Board, the requirement of fingerlings (100mm) @500/ha of effective water spread works out to 25,16,000, which is proposed to be apportioned reservoir wise among different carp species as shown in **Table 10.32**.

Table 10.32: Requirement of Fingerlings

Reservoir	**Effective water spread (ha)**	Species			**Total Fingerlings**
		Catla @50%	Rohu @30%	Mirgal @20%	
Anjanagiri	535	133750	80250	53500	267500
Veeranjaneya	937	234250	140550	93700	468500
Venkatadri	867	216750	130050	86700	433500
Kurumurthiyraya	1375	343750	206250	137500	687500
Udandapur	1018	254500	152700	101800	509000
K.P Lakshmidevipally	300	75000	45000	30000	150000
Total	**5032**	**1258000**	**754800**	**503200**	**2516000**

10.9.2.2 Construction of Peripheral Rearing Areas

The construction of peripheral rearing area (land based peripheral model) is being recommended as it has been found successful. Peripheral model is simply earthen dyke pond, constructed at the fringe of the reservoirs, having their own small catchments area (rain fed). During rainy season, it becomes submerged at F.T.L. of the reservoirs. Height of the Bundh wall of that dyke pond is slightly higher (1.5 m) from the F.T.L. of the reservoir, which keep them separate from reservoir. Peripheral dyke Pond provided with Sluice Gate, waste weir with screen, Puddling, Bolder toe and stone pitching work etc. In peripheral rearing area, when seed attain 100 mm size, it is released into the reservoirs by opening the sluice gate. The seed automatically stocked into the reservoir without handling. Based on the norms in vogue at present @1.25 lakh fingerlings/ha, the peripheral area required form each reservoir has been worked out in **Table.10.33.**

Table 10.33: Requirement of Peripheral Rearing Area

Reservoir	**Total Fingerlings**	**Peripheral Rearing Area (ha)**
Anjanagiri	267500	3.34

Veeranjaneya	468500	5.86
Venkatadri	433500	5.42
Kurumurthiyraya	687500	8.59
Udandapur	509000	6.36
K.P Lakshmidevipally	150000	1.88
Total	**2516000**	**31.45**

10.9.2.3 Management of Peripheral Rearing Areas

The displaced persons will be rehabilitated in the fish seed production activities and fishing by bringing them under the fold of co-operative society. For this purpose, the Fisheries Department and Fishing Federation will train them in fishing methods and seed rearing. The rearing expenses will be met from the fishermen credit cards or from other schemes under the DOF. Buyback of the seed will be made by the Federation to the concerned fishermen cooperative society at the Government approved rates and the seed will be stocked in the reservoir. The net annual income per ha from fry to fingerling rearing shall be to the tune of Rs 50000. And for each fisherman it will be Rs 2.00 lakh/year as shown in **Table 10.34.**

Table 10.34: Net Annual Benefit of Rearing Fry to Fingerlings up to 100mm

S.No.	Particular	Quantity	Rate	Amount (Rs)
1.	Preparation of the pond i/c desilting, cleaning and minor repairing	One Job	L.S.	14600
2.	Purchase of fry (25 mm) with packing	2,50,000	8500/lakh	21250
3.	Transportation of fry fish seed	One Job	L.S.	2500
4.	Mustered oil cake	600	18/kg	10800
5.	Rice bran	600	18/kg	10800
6.	Super Phosphates	200	15/kg	3000
7.	Cow dung	2000	1/kg	2000
8.	Mineral Protein	5	1000/kg	5000
9.	Medicine	One Job	L.S.	2000
10.	Miscellanies Expenses	One Job	L.S.	3050
Total				75000
Returns				
Sale of the 1.25 lakh fingerlings @ 1.0/ piece				125000
Expenses on production of 1.25 lakh fingerlings				75000
Net annual Income per hectare				50000

10.9.2.4 Supply of Fishing Gadgets

The major fishing gear in reservoirs is surface gill nets of different mesh size (20 -150 mm bar size. The standard size of gill net is 50 x 2 m with a head rope, floats, and footrope with or without sinkers. The net is made of nylon twine. Every fisherman will be equipped with 10-kg finished nylon net with floats at subsidized rate of Rs 200/kg by the Fisheries Federation under co-operative assistance scheme or any other such scheme like RKVY scheme

For catching of fishes and manoeuvring in the reservoir tin boats with wooden frame shall be provided on sharing basis with one boat for four fishermen. In all 315 boats shall be required.

Apart from these ten mechanized boats shall be required for collection of catch from fishermen during fishing in different parts of the reservoir, transportation of fish and conservation of fish stock.

Table 10.35: Details of Fishing Gadgets

Reservoir	Effective water spread (ha	Number of fishermen	Number of Boats	Number of Motor Boats
Anjanagiri	535	134	33	1
Veeranjaneya	937	234	59	2
Venkatadri	867	217	54	2
Kurumurthiyraya	1375	344	86	2
Udandapur	1018	255	64	2
K.P Lakshmidevipally	300	75	19	1
Total	**5032**	**1258**	**315**	**10**

10.9.2.5 Fish Landing Centre

For providing ease in landing and berthing facilities for fishing craft operating in reservoir, a fish-landing centre in the form of a jetty/quay shall be established in vicinity of habitation. The fish-landing centre shall be furnished with fish handling shed and equipped with packing and storage facilities, ice crushing machine, weighing scale/bridge, insulated boxes of 500kg and 1000kg capacity, electric and water supply and an administrative building. The cost of establishing the centre with all accessories shall be about Rs 20 lakh and shall be funded by the project proponent.

10.9.2.6 Capacity Building

The fishermen will be imparted training in fishing techniques and operation of boats, handling, storage and transport of fish etc. They will also be provided with productive assets to pursue their vocation. Capacity building shall also focus of on seed quality, seed rearing, varieties, size, species ratio, density, seed health and marketing.

10.9.2.7 Infrastructure Development

Infra structure development shall include construction of fish market, establishing of fish processing units, mobile/Retail fish outlet and construction of ice plant.

10.9.2.8 Fish Bio-diversity and Aquatic Resource Conservation

Hydro-biological investigations of the reservoir will be carried out after the impoundment stage. It is therefore proposed to take up some limnological and fisheries related investigation essential for eco-oriented development of the reservoir. It is proposed to undertake studies on fish fauna diversity and existing fish population, both above and below the dam. Location of breeding grounds and studies related to fish population dynamics etc. with a view to achieve a sustainable yield.

10.9.3 Conservation and Management

The State Fisheries Riverine Rule provides protection, conservation, development and management of fisheries in the State waters. These rules need to be enforced strictly. Apart from this, reservoir fishing rules are also to be framed which would include regulation of mesh size, restrictions on catching of major carps below certain size and w eight, observation of close season etc. Under the existing rules, fishing is restricted from 1 July to 31 August of every year, which is the breeding season of major carps and also certain cat fishes. Since from these reservoirs open canals and irrigation canal also offtake, at head regulators of such canal mesh/screen shall be installed in front of trash rack.

10.9.4 Conservation and Management of Fishes under Phase-II

Phase-II of PRLIS is only for construction of main canal and distribution system. The water conduit system for lifting and creation of reservoir to store water at different stages is incorporated under Phase-I. Thus, neither any reservoir having the productive water area shall be created under Phase-II works nor the canals are expected to retain water throughout the year and offers an opportunity for fishery development to help in the increasing employment potential and provide alternate employment to poor and to produce protein rich food improve human dietary standards in rural area and raising the net income of rural community. The ponds of the affected people in the project area can be selected for pisciculture and adequate training should be given to pond owners on pisciculture with project assistance for enhancing their livelihood. Necessary support for pisciculture may be extended in filling up the ponds from excess canal water in a judicious manner. The persons who are registered for fresh Water Aquaculture as per G.O.Ms.No. 28, Animal Husbandry, Dairy Development and Fisheries (Fish.II) Department Dated: 02-09-2016, can seek assistance for renovation of existing ponds/tank. On this count a budgetary provision of Rs. 100 lakh is being proposed.

10.9.5 Cost Estimate of Fish Management Plan

The cost estimate under various head is enumerated in **Table 10.36**.

Table 10.36: Cost Estimate of Fish Management Plan

S.N.	Particular	Quantity	Rate	Amount (Rs lakh)
Phase-I				
Anjanagiri Reservoir				
1.	Fish Landing Centre	1	20	20.00
2.	Construction of Peripheral Rearing Area	3.34	20 lakh/ha	66.80
3.	Fish Seed Stocking	267500	2 /lakh	5.35
4.	Boats	33	30000/No	9.9
5.	Nylon Nets	134	2000/No	2.68
6.	Motor boat	1	25lakh/No	25.00
7.	Training to fishermen	134	2000/No	2.68
8	Infra structure Development			
(a)	Mobile/retail fish outlet	1	Rs 20 lakh/unit	20.00
(b)	Ice Plant	1	Rs 20 lakh/unit	20.00

9	Fish Bio-diversity and Aquatic Research	1	10.00	10.00
10	Metal mesh screen in front of trash rack	1 Job	L.S.	10.00
11	Contingency			2.59
	Sub-total			195.00
Veeranjaneya Reservoir				
1.	Fish Landing Centre	1	20	20.00
2.	Construction of Peripheral Rearing Area	5.86	20 lakh/ha	117.20
3.	Fish Seed Stocking	468500	2 /lakh	9.37
4.	Boats	59	30000/No	17.70
5.	Nylon Nets	234	2000/No	4.68
6.	Motor boat	2	25lakh/No	50.00
7.	Training to fishermen	234	2000/No	4.68
8	Infra structure Development			
(a)	Mobile/retail fish outlet	1	Rs 20 lakh/unit	20.00
(b)	Ice Plant	1	Rs 20 lakh/unit	20.00
9	Fish Bio-diversity and Aquatic Research	1	10.00	10.00
10	Metal mesh screen in front of trash rack	1 Job	L.S.	10.00
11	Contingency			1.37
	Sub-total			285.00
Venkatadri Reservoir				
1.	Fish Landing Centre	1	20	20.00
2.	Construction of Peripheral Rearing Area	5.42	20 lakh/ha	108.40
3.	Fish Seed Stocking	433500	2 /lakh	8.67
4.	Boats	54	30000/No	16.2
5.	Nylon Nets	217	2000/No	4.34
6.	Motor boat	2	25lakh/No	50.00
7.	Training to fishermen	217	2000/No	4.34
8	Infra structure Development			
(a)	Mobile/retail fish outlet	1	Rs 20 lakh/unit	20.00
(b)	Ice Plant	1	Rs 20 lakh/unit	20.00
9	Fish Bio-diversity and Aquatic Research	1	10.00	10.00
10	Metal mesh screen in front of trash rack	3 Job	L.S.	30.00
11	Contingency			2.05
	Sub-total			294.00
Kurumurthiyraya Reservoir				
1.	Fish Landing Centre	2	20	40.00
2.	Construction of Peripheral Rearing Area	8.59	20 lakh/ha	171.80
3.	Fish Seed Stocking	687500	2 /lakh	13.75
4.	Boats	86	30000/No	25.80
5.	Nylon Nets	344	2000/No	6.88
6.	Motor boat	2	25lakh/No	50.00
7.	Training to fishermen	344	2000/No	6.88
8	Infra structure Development			
(a)	Mobile/retail fish outlet	1	Rs 20 lakh/unit	20.00
(b)	Ice Plant	1	Rs 20 lakh/unit	20.00
9	Fish Bio-diversity and Aquatic Research	1	10.00	10.00
10	Metal mesh screen in front of trash rack	2 Job	L.S.	20.00
11	Contingency			2.89
	Sub-total			388.00
Udandapur Reservoir				

1.	Fish Landing Centre	2	20	40.00
2.	Construction of Peripheral Rearing Area	8.59	20 lakh/ha	171.80
3.	Fish Seed Stocking	509000	2 /lakh	10.18
4.	Boats	64	30000/No	18.30
5.	Nylon Nets	255	2000/No	5.10
6.	Motor boat	2	25lakh/No	50.00
7.	Training to fishermen	255	2000/No	5.10
8	Infra structure Development			
(a)	Mobile/retail fish outlet	1	Rs 20 lakh/unit	20.00
(b)	Ice Plant	1	Rs 20 lakh/unit	20.00
9	Fish Bio-diversity and Aquatic Research	1	10.00	10.00
10	Metal mesh screen in front of trash rack	6Job	L.S.	60.00
11	Contingency			4.52
Sub-total				415.00
K.P Lakshmidevipally Reservoir				
1.	Fish Landing Centre	1	20	20.00
2.	Construction of Peripheral Rearing Area	1.88	20 lakh/ha	37.60
3.	Fish Seed Stocking	150000	2 /lakh	3.00
4.	Boats	19	30000/No	5.70
5.	Nylon Nets	75	2000/No	1.50
6.	Motor boat	1	25lakh/No	25.00
7.	Training to fishermen	75	2000/No	1.50
8	Infra structure Development			
(a)	Mobile/retail fish outlet	1	Rs 20 lakh/unit	20.00
(b)	Ice Plant	1	Rs 20 lakh/unit	20.00
9	Fish Bio-diversity and Aquatic Research	1	10.00	10.00
10	Metal mesh screen in front of trash rack	3 Job	L.S.	30.00
11	Contingency			0.70
Sub-total				175.00
			Total Phase-I	**1752.00**
Phase-II				
1	Support for renovation of existing ponds/tank.			100.00
			Total Phase-I &II	**1852.00**

10.10 MUCK MANAGEMENT PLAN

10.10.1 General

For construction of different components of the project excavation in earth mixed with boulders, soft/disintegrated rock and hard rock involving blasting would be carried out. Large number of civil structures/canal masonry works like Regulators, CD works, Bridges and canal Drops(falls) shall be constructed. The excavation in foundation of these structure shall result in muck generation The excavation of minors and distributaries shall also result in large quantity of excavated material i.e. muck which shall have to be evacuated, disposed of and roller compacted or laid on mild slopes pari-passu with the excavation work, to such designated areas where the muck piles do not substantially interfere with either environment/ ecology or the

river flow regime and cause turbidity impairing the quality of water. The disposal of muck has to be scientifically planned keeping in view the pecuniary aspects necessitating nearness to the generating component of work, which understandably reduce the travel time of dumpers, interference to surface flow and ground water aquifer, and disposition of habitation.

10.10.2 Quantity of Muck of Phase-I Works and its Management

The works under Phase-I, primarily involves construction of six reservoirs and series of approach channels, open canals, tunnels, pump houses and for conducting water to various stages of lift. The work has been contemplated to be carried out under different 21 packages of which the work for five reservoirs and their connecting water conductor system is underway through 1 to 18 packages. The work of construction of water conductor system, pumphouse and uppermost reservoir viz., K.P. Lakshmidevipally proposed under package NO.19 ,20 and 21 have not been taken up. All pump houses are all located in deep pit and involve huge excavation in earth in all soils, soft rocks besides hard rocks. All reservoirs are earthen reservoirs which involve excavation for cut off trench, rock toe etc. Huge quantity of excavation in earth in all soils, soft rocks besides hard rocks is involved in open canals of water conductor system. Tunnels shall be driven through rock mass. As elucidated in **Table 10.37** the total quantity of muck generated from works under all 21 packages shall be 11,09,83,510 cum of which 2,41,86,734 cum shall be used for works under same packages while 2,85,83,491 cum shall be used for works under other packages and balance 5,82,13,285 shall be disposed at designated area (1996 ha) acquired for the muck disposal purpose. The rock mass shall be separately stacked in spoil banks so that it can be transported to stone crushing units for manufacturing of crushed aggregate of various sizes/grades and into crushed sand. The excavated hard rock shall be recycled as stone for revetment works and also for pitching on slope of embankment of reservoir. The height of muck piles on plain or almost plain / gently sloping ground shall be limited to 5m and these shall be laid with outer slope2.1 from stability consideration. In between two muck piles a gap of 5m should be maintained for the purpose of making garland drains. Stabilization of spoil banks must be ensured. The dumped material in spoil banks is generally not nutrient rich. In order to make it suitable for the plantation it will be provided bio treatment. The work plan will be formulated for re-vegetation of the dumping sites through Integrated Biotechnological Approach. The plantation can be carried out in lines across the slopes. Grass and herb species would be used in the inter space of tree species.

Table 10.37: Details of the Muck Generated Under Phase-I

S.No.	Name of the Package	Total Quantity of Excavation Material		Total Quantity	Reuse of Excavation Material in same Package (cum)	Utilization of Excavation Material in Other Packages (cum)	Balance Excavation Material (cum)	Area available for Muck Disposal (ha)
		Earth work (All soils, HDR, F&F (cum)	Hard Rock (cum)					
1	Package-1 (Stage-1 Pump House)	2183160	4313840	6497000	1512559	765000	4219441	42.51
2	Package-2 (Anjanagiri Reservoir)	3524818	82143	3606961	1082143	0	2524818	83.00
3	Package-3 (Open canal)	4604000	8254000	12858000	570000	3778000	8510000	121.86
4	Package-4 (Tunnel)	256002	6071000	6327002	1727802	0	4599200	111.34
5	Package-5 (Stage-2 Pumphouse)	1889851	2719918	4609769	1515000	0	3094769	121.46
6	Package-6(Veeranjaneya Reservoir & O.Cc)	9251533	529861	9781394	2713665	0	7067729	86.64
7	Package-7 (Tunnel)	255939	8384700	8640639	2707881	2357372	3575386	161.94
8	Package-8 (Stage-3 Pump House)	1441199	3660208	5101407	1521566	1523169	2056672	115.38
9	Package-9 (Venkatadri Reservoir)	584000	390000	974000	876000	0	98000	47.37
10	Package-10 (Venkatadri Reservoir)	780295	0	780295	250000	0	530295	30.36
11	Package-11 (Venkatadri Reservoir)	1733126	100856	1833982	1833982	0	0	50.61
12	Package-12 (Open canal)	7500000	6000000	13500000	920000	7000000	5580000	161.94
13	Package-13 (Kurumurthyraya Reservoir)	207670	26101	233771	233771	0	0	34.41
14	Package-14 (Kurumurthyraya Reservoir)	948321	1037	949358	949358	0	0	36.44
15	Package-15 (Kurumurthyraya Reservoir)	1393315	0	1393315	1393315	0	0	37.25
16	Package-16 (Stage-4 Pump House)	778200	4906477	5684677	2000000	3484677	200000	119.43
17	Package-17 (Udandapur Reservoir)	856620	12368	868988	32187	278000	558801	141.70
18	Package-18 (Udandapur Reservoir)	2158822	101183	2260005	101183	0	2158822	0.00
19	Package-19(Open canal and Tunnel)	7927718	14731275	22658993	400000	9256676	13002318	431.98
20	Package-20 (Stage-5 Pump House)	140597	773258	913855	336223	140597	437035	29.96
21	Package-21(K.P Lakshmidevipally Reservoir)	1454087	56012	1510099	1510099	0	0	30.36
Total		**49869273**	**61114237**	**110983510**	**24186734**	**28583491**	**58213285**	**1995.95**

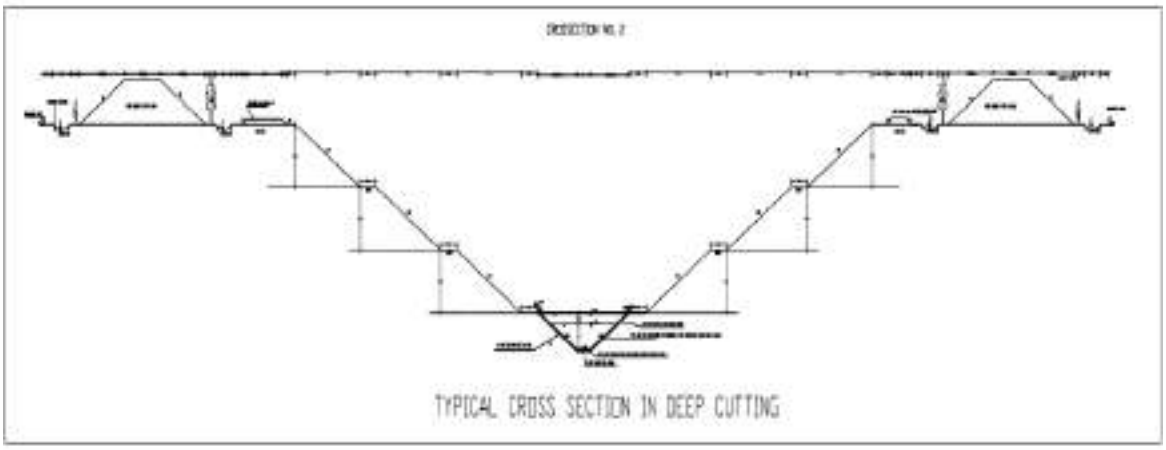
10.10.3 Quantity of Muck of Phase-II Works and its Management

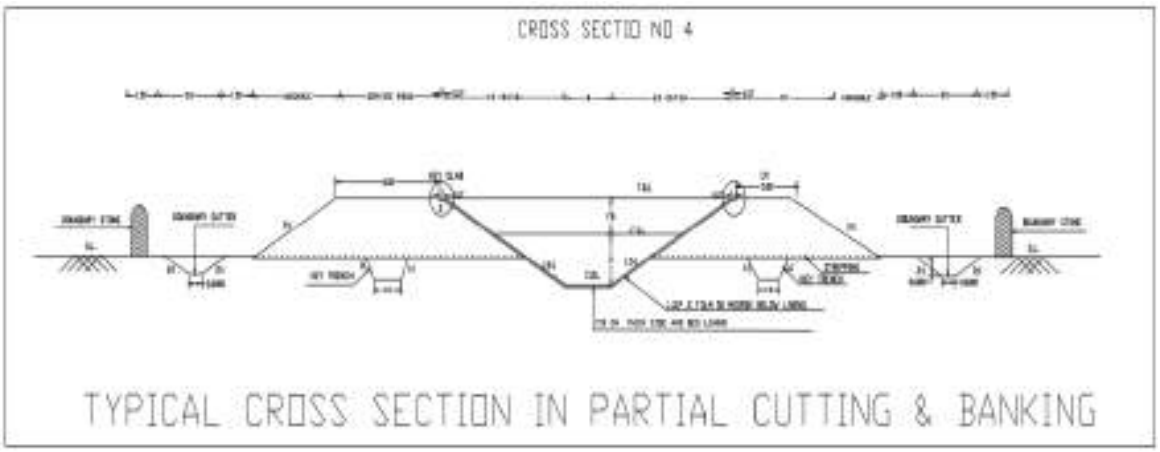
For most of the length the canals are in cutting, cutting and filling barring few reaches the canal section shall be in filling (Banking). In some of the reaches, the canals are in deep cutting and in rock strata. From such reaches huge quantity of rock mass shall be generated due to excavation. From reaches involving cutting, the muck which shall comprise of earth and rock mass shall be disposed on spoil banks on either side of the canals. The rock mass shall be separately stacked in spoil banks so that it can be transported to stone crushing units for manufacturing of crushed aggregate of various sizes/grades and into crushed sand. The height of spoil banks on both sides shall be limited to 6m. The details of muck generated from different components of project are detailed in **Table 10.38**. The total quantity of muck which is mainly ordinary earth, shall be entirely consumed on project work requiring earthwork in filling like coffer bunds for canal drainage works, part of guide bund and in filling section of canal system and rest shall be dumped in spoil banks leaving nothing to be disposed outside of project area. The excavated hard rock shall be recycled as stone aggregates and crushed sand and as stone for revetment works. The typical canal sections in different situations viz., in deep cutting, in partial cutting and filling(banking) and in full filling(banking) with the disposal of muck is shown in **Figure 10.8.**

Precaution should be taken to avoid any flushing down of the excavated material in the water bodies during monsoon, as it may significantly bring down changes in the aquatic ecosystem of the area. The excavated soil and rubble emanating from the excavation will be utilized for filling of low-lying areas and also as revetment, riprap & filters. Excess utilizable soils are proposed for sharing with other agencies on royalty/seignories charges as per norms. The spoil banks shall be created in layers and each layer being roller compacted. Stabilization of spoil banks must be ensured. The dumped material in spoil banks is generally not nutrient rich. In order to make it suitable for the plantation it will be provided bio treatment. The work plan will be formulated for re-vegetation of the dumping sites through Integrated Biotechnological Approach. The plantation can be carried out in lines across the slopes. Grass and herb species would be used in the inter space of tree species. They will help in providing the continuous chain of support in retaining debris, reinforcing soil and increasing the infiltration capacity of the area. In order to stabilize the stacked dumped material, vegetation cover would be provided to hold dumped material over a period of time. The spoil bank slopes being unstable and having loose materials may get disturbed immediately by rains, which may result in soil erosion and formation of rills and gullies. Furthermore, direct exposure to sun light may also result in loss of soil moisture and increase of substratum temperature, which may hamper the growth and establishment of vegetation. To overcome of these problems, geo-textile may be used followed by seed broadcasting and planting of seedlings of suitable plant species. Seed broadcasting has to be taken up by using hydro seeding or by spreading slurry manually. Hydraulic seeding is being successfully practiced to stabilize barren steep slopes and fragile unstable surfaces.

Table 10.38: Canal Wise Details of the Muck Generated and its Management

S. N.	Name of Main Canals	Quantity of excavation in cutting (lakh cum)	Quantity of excavation in hard rock (lakh cum)	Quantity in banking (lakh cum)	Quantity of muck disposed in spoil banks (lakh cum)	Quantity of hard rock mass recycled as aggregate (lakh cum)
1	VMC	279	75.33	21.37	182.30	75.33
2	LLC	12.15	3.28	0.77	8.10	3.28
3	HLC	182.7	49.33	11	122.37	49.33
4	LLC	21.78	5.88	3.85	12.05	5.88
5	LMC	262.66	70.92	17.92	173.82	70.92
6	EMC	186.55	20.37	158.64	6.99	50.37
7	SMC	14.8	4.00	1.66	9.14	4.00
8	NMC	225.68	60.93	1.11	163.64	60.93
9	RMC 1-R	1.9	0.51	0.02	1.37	0.51
10	RMC 2-R	78.17	21.11	15.1	41.96	21.11
11	Hanwada	5.88	1.59	2.46	1.83	1.59
12	Maddur	98.5	26.60	20.13	51.78	26.60
Total		**1369.77**	**339.85**	**254.03**	**775.35**	**339.85**





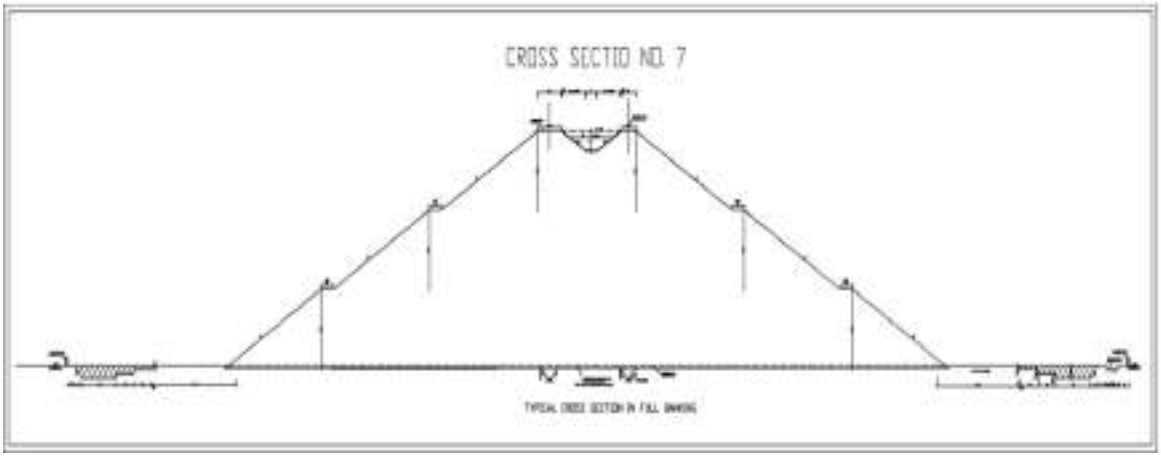


Figure 10.8: Typical Cross Section of Canal

10.10.4 Top Soil Management

The top soil connotes the soil layered under O-horizon and A-Horizon of soil profile; the former has organic matter in different stages of decomposition whereas the latter is known to be active zone for biological activities responsible for making the nutrients available for plant growth. The project involves surface excavation in canal section and canal masonry works. Before commencing the excavation of top soil and subsoil, top soil stripping is necessary. The excavation activities shall cause disturbance and removal of soil of A-horizon of soil profile in project area and submergence area besides command area of rich cultivable land, which is rich in organic matter and has good nutrient contents, which needs to be stripped and stocked aside and preserved to be used.

The top soil generated shall be used on surface of turfing the surface profile of the canal outer banks and in other similar places where plantation is proposed. Thus, the top soil shall be overlaid on the excavated material and the area shall be fully rehabilitated. The top soil management plan shall involve the following

Top soil stripping

- Prior to stripping area to be stripped should be delineated
- Clearance of vegetation before stripping to salvage of all suitable topsoil material
- The area to be stripped should be applied with water to bring the soil in moist condition
- The area suitable for stock pile should be delineated in advance.
- Top soil should be stripped using appropriate equipment.

Stock piles of top soil

- The site shall be away from construction site in such area which has no defined drainage line.
- The site should be so located that it is not aligned along prominent wind direction.
- The top surface of the soil stacks shall be covered with geo-mat so that the soil moisture regime is maintained, soil organic matter level is not allowed to be depleted.

- In situation where the top soil is to be used for a period in excess of half year and the soil is not able to regenerate natural vegetation some cover crop may be grown after applying FYM to the soil
- The stock pile should be in plain area and its height should not exceed 2m
- The designated area for stacking top soil shall be properly fenced and a surface drain of 0.5X0.5 m section shall be laid 1m away from the edge of stack of top soils so that the soil washed rain during rains and carried with rainwater is collected in the drain silt trap.
- The stock pile should have outer slope of 2:1 to 3:1 to preclude the potential risk of erosion of outer exposed surface of stock pile.

10.10.5 Cost Estimate For Muck Disposal Plan

The cost estimate for muck disposal plan indicating engineering, biological, bio-technological measures and maintenance is provided in **Table 10.39**.

Table 10.39:Cost Estimate for Muck Disposal Plan

S.N.	Particulars	Quantity	Unit	Rate (Rs.)	Amount (Rs. lakh)
A. Engineering Measures					
Phase-I					
A. Engineering Measures					
1	Barbed wire fencing with five strand barbed wire fencing stretched across creosoted wooden fence posts reinforced with two layers of live hedge plants	1996	ha	20000	399.20
2	Spreading of top/fertile soil over the area where green belt shall be developed	30000	cum	100	30.00
Subtotal (A)					429.20
B. Biological Measures					
1.	Providing and fixing jute geotextile	200	ha	500000	1000.00
2	Plantation including maintenance	810	ha	100000	810.00
3	Cost of FYM and Bio-fertilizers	1	Job	LS	30.00
4	Cost of watering/irrigation	1	Job	LS	70.00
5	Watch and ward	1	Job	LS	41.00
Subtotal (B)					**1951.00**
Grand Total (A) + (B)					**2380.20**
					2380.00
Phase-II					
A. Engineering Measures					
1	Barbed wire fencing with five strand barbed wire fencing stretched across creosoted wooden fence posts reinforced with two layers of live hedge plants	450	km	45000	202.50
2	Spreading of top/fertile soil over the area where green belt shall be developed	300000	cum	100	300.00
				Subtotal (A)	**500.00**

B. Biological Measures					
1.	Providing and fixing jute geotextile	1080	ha	500000	5400.00
2	Plantation including maintenance	925	ha	100000	925.00
3	Cost of FYM and Bio-fertilizers	1	Job	LS	50.00
4	Cost of watering/irrigation	1	Job	LS	100.00
5	Watch and ward	1	Job	LS	150.00
				Subtotal (B)	**6625.00**
				Grand Total (A) + (B)	**7125.00**
Total Phase I &II					**9505.00**

10.11 RESTORATION PLAN FOR QUARRY SITES

10.11.1 General

The works under Phase-I, primarily involves construction of six reservoirs and series of approach channels (10.25km), open canals (53.285km), tunnels(47.845km), pump houses. For all reservoirs huge quantity of earthen material in embankment (73.35km), casing and hearting shall be required. Each reservoir shall have a cut off trench for which COT material shall be needed. The upstream face of slope of embankment shall be provided with stone pitching laid over filter material. Wave breakers of stone shall also be provided. Besides this on downstream slope rock toe with longitudinal and lateral drains shall be constructed. For construction of tunnel portals and cement concrete lining of tunnels huge quantity of coarse and fine aggregate shall be needed. In open canals at some locations revetment walls and seepage drains shall be constructed for which stone and filter material shall be needed. For construction of pumphouses and appurtenant works like, surging pools and delivery chamber/tank, huge quantity of concrete of different grades shall be laid for which coarse and fine aggregate shall be needed, besides revetment and filter material

The project under Phase-II envisages construction of 13 main canals (total length 915.47 km) and distribution system besides canal masonry works like Regulators, CD works, Bridges and canal Drops(falls). For most of the length the canals are in cutting, cutting and filling barring few reaches the canal section shall be in filling (Banking). In some of the reaches, the canals are in deep cutting and in rock strata. From such reaches huge quantity of rock mass shall be generated due to excavation. From reaches involving cutting, the muck which shall comprise of earth and rock mass shall be disposed on spoil banks on either side of the canals. The rock mass shall be separately stacked in spoil banks so that it can be transported to stone crushing units for manufacturing of crushed aggregate of various sizes/grades and into crushed sand. Therefore, huge quantity of construction materials like coarse and fine aggregates, boulders, stones and filter materials are required in addition to cement, structural steel and reinforcement steel. The quantities of construction materials like fine aggregate, coarse aggregate filter material, for various uses, after incorporating the quantity likely to be obtained from excavation, are mentioned in **Table 10.40.**

Table 10.40:Quantity of Various Materials (lakh cum)

Material	Requirement	Available from work	Total Requirement
Phase-I			

Material	Requirement	Available from work	Total Requirement
COT Filling	12045704	12045704	-
Embankment	239710699	239710699	-
Hearting	34707680	34707680	-
Fine Aggregate	2630205	2630205	-
Fine Filters	8066873	8066873	-
Coarse Aggregate	7209998	7209998	-
Coarse Filters	3437677	3437677	-
Revetment & Rock toe	8756931	8756931	-
Phase-II			
Sand	100.00	100.00	-
Coarse Aggregate	140.00	140.00	-
Boulder/Pitching stone	80.00	80.00	-
Filter material	10.00	10.00	-
	330.00	**330.00**	-

10.11.2 Details of Quarry Sites

10.11.2.1 Quarry for Coarse Aggregate /Boulder and Sand

For obtaining these material, no in-situ rock quarry is contemplated under the project as per DPR in so far as the project proponent shall get sufficient rock mass for production of these materials through crushing. Though the Project proponent had already got tested the samples, yet he is advised to collect samples of blasted collect rock mass and dispatch these to laboratory investigations for following physical tests as per IS:2386-1963 for assessing their suitability for use as coarse aggregate as well as crushed fine aggregate in concrete for wearing and non-wearing surfaces.

- Specific Gravity
- Water Absorption
- Aggregate Abrasion Value
- Aggregate Crushing Value
- Soundness Loss
- Aggregate alkali Reactivity Test
- Petrographic Analysis

10.11.2.2 Quarry/Borrow Area for Earth for canal section

Since the canals are either in cutting, cutting and filling barring few reaches the canal section shall be in filling (Banking), therefore no borrow area shall be required for obtaining earth for filling (banking) sections of canals as these shall be available from the excavated earth. Laboratory test on collected samples from excavated material should be undertaken to determine the physical properties of soils. Soil samples shall be tested for mechanical analysis, Waterberg limits, Proctor compaction, permeability, tri-axial shear tests with pore pressure measurements under OMC and saturation conditions, and suitability tests in soils with highly soluble contents.

10.11.3 Management Plan

- The working along canal alignment should be taken up after acquisition of land and assets to it. In case, working has to commence before land acquisition, explicit and written arrangement with the owner should be made, mentioning the land involved and assets likely to be impacted.
- The access road to the working area should be marked, explicit and written arrangement with the owner should be made, mentioning the land involved and assets likely to be impacted.
- The spoil bank area should be properly fenced with five strand barbed wire fencing stretched across creosoted wooden fence posts reinforced with two layers of live hedge plants, before commencing the work so as to avoid unauthorized entry of people and to ward of animals from entering. The fencing should be dismantled after the consumable material is taken to crusher or other places to be reused in other places like green belt along canal.
- Top 15-30 cm of soil of A-horizon of soil profile of rich cultivable land, which is rich in organic matter and has good nutrient contents should be stripped and stocked aside to be used on surface of turfing the d/s surface profile of the canal bank and in other similar places where plantation is proposed.
- Special anti-malaria measures may be adopted near habitations, in consultation with the Public Health Department.

10.11.4 Cost Estimate for Restoration of Borrow Areas

The details of the expenditure likely to be incurred on the implementation of measures to be adopted are placed in **Table 10.41**.

Table 10.41:Cost estimates for restoration of borrow areas

S.N.	Item of Work	Qty.	Unit	Rate (Rs.)	Amount (Rs. lakh)
Phase-I					
1	Barbed wire fencing, with five strand barbed wire fencing stretched across creosoted wooden fence posts reinforced with two layers of live hedge plants, in storage area of aggregates and filter material.	32	ha	45000	14.40
2	Anti-malaria measures	2	year	150000	3.00
3	Watch and ward 18 No Chowkidars @ Rs 9815 p.m. for 24 months	432	months	9815	42.40
4	Provision for Settling Tanks	Job		LS	2.20
				Total Phase-I	**62.00**
Phase-II					
1	Barbed wire fencing, with five strand barbed wire fencing stretched across creosoted wooden fence posts reinforced with two layers of live hedge plants, in storage area of aggregates and filter material.	60	ha	45000	27.00
2	Anti-malaria measures	2	year	150000	3.00
3	Watch and ward 18 No Chowkidars @ Rs 6000 p.m. for 24months	432	months	9815	42.40
4	Provision for Settling Tanks	Job		LS	3.60
				Total Phase-II	**76.00**
				Total Phase-I&II	**138.00**

10.12 DISASTER MANAGEMENT PLAN

10.12.1 Introduction.

A disaster is an unwarranted, untoward and emergent situation that culminates into heavy toll of life and property and is a calamity sometimes caused by "force majeure" and by human error. The identification of all types of disaster in any proposed project scenario involves the critical review of the project vis-à-vis the study of historical past incidents/disasters in the similar situations. The evolution of disaster management plan dwells on various aspects such as provision of evacuation paths, setting up of alarms and warning systems, establishing communicating system besides delineating an Emergency Response Organization with an Effective Response System. Keeping in view the grievous affects a disaster can cause on human or animal population, loss of property and environment in and around the areas of impact. Therefore, it is essential to assess the possibility of such failures in context to the present project and formulate a contingent plan.

Under Phase-II main canals shall off take from four reservoirs at different elevation and shall irrigate command area sprawled in five districts. Thus, the disaster which can happen to main canals and canal masonry structures is being discussed in this chapter.

10.12.2 Vulnerable Zones and Mitigation Measures

10.12.2.1 Reservoirs

The reservoirs which shall store water for multiple purpose such as drinking, industrial use any irrigation are earthen dams. These reservoirs can fail for mainly two reasons viz., piping or overtopping. Since the capacity of these reservoirs is very high, the volume of flood water through the breach section shall also of large magnitude and in the event of breach it will inundate large area in the command. If the breach takes place near the head regulators of the canals, there is likely hood of the damage to the structure and uncontrolled flow of flood water into the canal section beyond its designed discharge and jeopardized the safety of canal sections in banking and also in cutting and filling. Therefore, it is important that a special vigil must be kept at the off-taking point of the canals from the reservoirs and the close watch of the downstream face of the reservoirs to notice seepage and sweating of the slope surfaces or the counter berms. The discharge flowing in seepage drains on the downstream must be observed in routine to found out any increase in turbidity of seepage water. Piezometer must be established on downstream of reservoir and their levels must be observed monthly and any unusual change in piezometer level must be closely watched and investigated.

Based on Regression equations developed by Froehlich (2008) for failure of earthen dam, the breach bottom width and time for breach formation time in hour is given by the following relation

$B_{av.} = 0.27 K_a \times V_m^{0.32} \times h_b^{0.04}$

$T_f = 63.2 (V/gh_b^2)^{1/2}$

where,

B av. = average breach width

Ka=constant (1:3 for overtopping and 1.0 for piping failure)

V w= reservoir volume at time of failure in cubic meter

Hb= height of final breach in meter

G=acceleration due to gravity

Tf=breach formation time in hour

Side slope should be 1:1 for overtopping & 0.7:1 for piping.

For different reservoirs the Breach width and the breach formation time has been assessed and provided in **Table 10.42.**

Table 10.42: Breach Parameters

S.N.	Reservoir	Capacity at FRL in cum	Height (m)	Breach width in meter	Time of breach formation (hour)
1	Anjanagiri	225120000	74	198.7	1.4
2	Veeranjaneya	168620000	38	159.6	2.2
3	Venkatadiri	459860000	57	237.6	2.6
4	Kurumurthiyrya	470910000	61	242.5	2.5
5	Udandapur	441180000	58	235.3	2.5
6	KP Lakshmidevipally	64010000	51	123.8	1.0

In case of any breach of a reservoir, the alert must be passed on to the control room of all reservoirs and pump houses besides the lifting from the reservoir immediately lower to the breached reservoir must be stopped immediately as per regulations for operating reservoirs. The surplus weir must be immediately opened and if need be, the main canal(s) off taking from the breached reservoir may also be opened to reduce pressure in the breached section.

10.12.2.2 Canals

The main canals in most of its length in head reaches in particular and other reaches in general are in digging and thus there is least occasion for their breach. The main canals and branches in such reaches where they are totally in filling are liable to breach for one reason or the other. The breach shall be partial and it is difficult to predict the location of such a breach. The time for breach formation would be in the range of a few minutes. Though a strict vigil may be exercised yet the chances of breach happening on the linear canal project cannot be ruled out. The extent of the damage shall depend upon the discharge passing the breach section and the availability of a nearby natural drainage and it carrying capacity for letting the flood water through it. Since the area likely to be inundated due to breach is almost a plain area the spreading water shall have low depth and shall be able to get negotiated through surface drains proposed under the project. Thus, loss of life and property shall be minimized. Since the site of a breach is unpredictable it is not possible to carry out hazard assessment and flood damage analysis at this juncture.

Wherever information of occurring of a breach is received, the immediate action should be to

reduce the discharge at site of breach by opening escapes upstream of breach site and side by side opening of all such channels up stream which are not running. As a secondary measure, the discharge from head can be reduced. Thus, for these unforeseen condition escapes which discharge into nearby natural drainage shall have to be provided. It is therefore proposed to make provision for escape upstream of canal sections in heavy filling(banking). As a general rule one escape may be provided for every 30 km length of main canals.

10.12.2.3 Canal Drainage works

Due to meandering nature of rivers, the river behaviour changes and the current tends to shift towards left or right thus endangering the safety of afflux bunds of the canal drainage works in particular. Therefore, the failure of guide bunds/afflux bunds could trigger a major catastrophe/disaster. The damage to an afflux bund is again not imminent and can be checked by adopting anti-scouring measures like placing boulder wire crates/balla crates and studs in the affected reach during the happening of flood and on its subsidence. For this sufficient reserve stock has to be stacked near the vulnerable locations in particular and elsewhere in the vicinity so that these could be used at a very short notice.

10.12.2.4 Siltation

The suspended sediments in river water if allowed to make entry into the main canal without adopting silt control measures may lead to excessive sediment deposits in bed of canals and thereby reducing their carrying capacity. During early period of flood season, the medium flood which carries with it the hill wash from catchment areas results in higher concentration of sediments. Therefore, suitable measures have to be adopted. In the present case the water shall be lifted from back waters of Serialism reservoir which implies that lesser silt laden water shall be lifted. Under Phase-II, Venkatadri main canal shall take off from Venkatadri Reservoir, which itself get filled after third stage of pumping. It means almost silt free water shall be conveyed into main canals. A part of the suspended sediment of the water in the reservoir would always thrust its way into the canal. If the sediment transporting capacity of the canal is not adequate to transport this sediment, the canal would get silted. Since the main canal shall run during monsoon also it will be ensured that excessive silt entry is not allowed for which water samples shall be collected once daily and the silt content worked out in part per million. The velocity in main canals is in the range of 0.7m/sec-0.9 m/sec. and thus no siltation problem is foreseen in main canals.

10.12.3 Dam break Analysis

The project Proponent had caused dam break analysis for Kurumurthyraya Reservoir through CWPRS, Pune, who had documented their study IN Technical Report No. 6068, November,2022. As the terrain on the downstream of the reservoir is flat, the study was conducted for five deepest bed levels along the earthen bund. The breaching of dam at these deepest points results in the worst flood scenario on the downstream of the reservoir. Therefore, the dam break study was carried out at these five deepest points separately as Scenario 1, Scenario 2, Scenario 3, Scenario 4 and Scenario 5.

10.12.3.1 Model Used

The dam break flood hydrograph was estimated for each scenario by routing of storage through breaching area and further it was routed through the downstream area. The unsteady flow simulations were carried out by developing 2-D mathematical model using Hydrologic Engineering Centre - River Analysis System (HEC-RAS) software. In general, the dam can likely fail either by overtopping or by piping. In the present study, for arriving at likely worst flood scenario on the downstream area, the breaching of dam due to overtopping at five deepest locations was assumed.

10.12.3.2 Brach Parameters

The breach parameters estimated for the present study are as per the standard guidelines given in the manual for Dam Break Analysis using HEC-RAS software. The description of the reservoir will enable computing the outflow hydrograph in HEC-RAS. The breach outflow (Qb) is computed as a broad crested weir flow. Such a parametric representation of breach is utilized in HEC-RAS for the reason of simplicity, generality and applicability.

In the present study, dam break simulations were carried out for 6 min, 12 min and 18 min breach formation time. The mode of failure was taken as overtopping and trigger failure was considered with water surface elevation at FRL (531m) . Physical description of the breach i.e., breach bottom elevation, breach bottom width and side slopes (H: V – side slopes are expressed in the units of distance in horizontal to the unit of distance in vertical).

Table 10.43: Breach Parameters Considered

S.N.	Breach Parameters	Scenario-1	Scenario-2	Scenario-3	Scenario-4	Scenario-5
1	Bottom Width (m)	1700	1800	510	2000	600
2	Bottom Elevation (m)	504	500	500	500	512
3	Left Side Slope (H:V)	6:1	7:1	4:1	6:1	6:1
4	Right Side Slope (H:V)	6:1	7:1	4:1	6:1	6:1
5	Breach Weir Coefficient	1.44	1.44	1.44	1.44	1.44
6	Breach Formation time (hr)	0.1	0.1	0.1	0.1	0.1

10.12.3.3 Dam Break Simulation

The dam break simulations were carried out using 2-D mathematical model and the dam break flood hydrograph was estimated. Then this flood hydrograph was routed through the do6wnstream 2-D flow area and the dam break flood hydrograph, stage hydrograph, inundation map, water depth map, velocity map and arrival time map were extracted which can be used as an input for EAP. In the present study, the flood generated due to breaching occurred at five different locations under level pool scenario was independently routed through respective 2-D flow areas up to the backwater of Srisailam reservoir with the downstream boundary condition considered as the FRL of Srisailam reservoir. The dam break flood hydrograph and stage hydrograph were estimated at specific locations along the 2-D flow area. . The total study reach was divided into zones named A to D. The zone “A” considers chainage downstream of dam from 0.00km to 20 km; the zone “B” from 20.00km to 45 km; the zone “C” from 45.00km to 70 km and the zone “d” considers chainage downstream of dam from 70.00km to 100 km i.e, up to Srisailam Reservoir.

10.12.3.4 Results and Conclusion

The maximum peak value for the dam break flood hydrograph was noticed for the dam break simulations carried out for the breach time 0.1 hr in respect of all scenarios under overtopping condition. Further part of the study was carried out using these parameters for arriving at the most vulnerable condition on the downstream part of the reservoir. The dam break flood hydrographs and stage hydrographs were extracted from the dam break simulations for each scenario independently. The profile lines were plotted along the study reach at an interval of 5 km for the extraction of the results. The output i.e. dam break flood hydrograph and stage hydrograph were extracted at these profile lines.

Variation of Flood Discharges Under Various Scenarios

it was seen that zones A & B are influenced with maximum discharge varying from 300475 m3/s to 64488 m3/s within 4 hrs from breaching of Kurumurthyraya reservoir under scenario 1. Then the recession of flood was observed from 62712 m3/s to 12664 m3/s in subsequent 8 hrs in the zones C and D. In scenario 2, zones A and B are affected with the flood of 390136 m3/s to 77023 m3/s within 4 hrs from the breaching. The flood recedes from 72886 m3/s to 14018 m3/s in zones C and D in subsequent 8 hrs. In scenario 3, the flood is varied from 242866 m3/s to 71295 m3/s within 4 hrs from breaching of dam in zones A and B. Then it is declined to 13000 m3/s in subsequent 8 hrs in zones C and D. Zones A and B are affected with flood varying from 436259 m3/s to 77834 m3/s in 4 hrs from breaching of dam under scenario 4. The flood is subsidized to 13981 m3/s in subsequent 7 hrs in zones C and D. In scenario 5, the zones A and B are affected with flood of 140809 m3/s to 36269 m3/s within 4 hrs from breaching of dam. Then it recedes to 8391 m3/s in subsequent 8 hrs in zones C and D.

Variation of Maximum Stages Under Various Scenarios

In scenario 1, maximum stage was varied from level 521 m to 346 m in 4 hrs under zones A and B. The maximum stage varied from level 520 m to 347 m in 4 hrs for zones A and B under scenario 2. In Scenario 3, maximum stage varied from level 491 m to 343 m in 4 hrs for zones A and B. For scenario 4, the maximum stage varied from level 538 m to 348 m in 4 hrs. In scenario 5, the maximum stage varied from level 471 m to 350 m in 4 hrs. For zones C and D, the maximum stage varied from level 340 m to 271 m in 8 hrs. under all scenarios. In addition, maximum water depth, maximum velocity and minimum arrival time maps were extracted for all scenarios from the 2-D mathematical model in HEC-RAS. These maps are superimposed on the base map using ArcGIS software for understanding severity of flood so as to carry out necessary remedial measures under Emergency Action Planning (EAP). The results for breach under scenario-1 are tabulated in **Table10.44.**

Table 10.44: Results of Dam break under Scenario-1

Zone	Chainage (km)	Maximum WSE(m)	Maximum Velocity (m/s)	Maximum Depth (m)	Min. Arrival time (hrs)	Villages under and nearby zone
A	0	521	2.87	46.92	0.11	Charla Thanda, Narsinghapur, Kottu, Kothur, Karivena
	5	489	6.56	31.55	0.32	Bhuthpur, Gopal palli, Gopalapur Khurd, Pothulamadugu, Kotha Molgara, Patha Molgara, Madigatla, Kappeta
	10	446	5.90	24.75	0.99	Ravalpalle, Annasagar, Polkampally, Thirumalaipalle, Tirmalayapally, Malkimianpalle, Tadikonda, Thimmapur, Anthaipalle, Kamaluddinpur, Anpahad D
	15	425	5.44	23.57	1.54	Janampeta, Moosapet, Mohammed Hussainpalle, Agaram, Venkatampalle
	20	412	3.77	22.57	1.98	Thunkinipur, Malkapur, Komreddypally, Kandoor, Sankalamaddi, Nijalapur
B	25	399	10.06	24.52	2.48	Ponnakal, Shakhapur, Dasaripalle
	30	386	5.76	21.72	2.87	Nandipet, Gudibanda, Rachala, Katavaram, Addakal, Peddamungalachedu, Puttapalle, Israpally, Chinnamungalachedu
	35	367	8.09	16.15	3.31	Venkatagiri, Rekulampally, Perur, Venkampally, Kanmanoor, Muthyalampalle, Baleedupalle
	40	357	8.56	15.79	3.6	Vame
	45	346	4.73	14.16	3.99	Amravathinagar, Pathajangamaipalle, Kanimetta, Konnur, Shankarampeta, Ramnathpur, Palem
C	50	339	4.81	18.62	4.63	Narsingapur, Kothapalle, Govindahalli, Madanapur, Nelividi, Thirumalaipalle, Gopanpet, Dantanoor, Karvena
	55	330	5.49	12.58	5.19	Ramanpadu
	60	324	7.86	17.92	5.27	Medepalle, Ajjakollu
	65	312	5.30	15.17	5.48	Cherlapalle, SC colony, Apparala, Thippadampalle
	70	305	4344	16.71	6.13	Ramakrishnapur, Veeraraghavapur, Pamapuram, Rechintala, Rechintala, Ramammapeta, Beerole, Basapur
D	75	283	4.54	11.33	7.18	Gurramgadda
	80	278	6.85	9.88	7.29	Beechupalli, Janumpalle, Sasnool
	85	276	2.83	9.84	7.68	Munagamanudinne, Bochuveerapur, Karpakula, Penchikalpadu
	90	274	2.03	9.77	7.99	Mangampeta, Rajsrigarlapad, Pallepadu, Thippaipalle
	95	272	1.53	6.45	8.32	Gummadam
	100	271	1.71	7.26	8.56	Gaddabaswapuram

10.12.4 Disaster Management Plan

The emergency planning for disaster scenario *inter alia* includes provisions like setting up of alarms and warming system, establishing communication system besides aspect concerning human behaviours, procedure to be adopted, roles and responsibilities. The plan is intended to serve as a reference document or blue book consisting of salient information indicating the action to be taken in the emergency situation. Before such a plan can be chalked out, it is imperative to identify the vulnerable zones through maps, the nature of damage potential and the socio-economics data and structures likely to be affected. Based on the characteristic of each hazard zone, the needed response could be delineated in the plan. Thus, the plan is aimed to provide for:

- Timely warning and alert
- Assess the damage potential
- Delineate emergency action and procedures
- Delineate emergency organization.
- Delineate procedures for mitigation and control of incident
- Define roles and responsibilities
- Delineate access routes and safe locations
- Providing public information

10.12.4.1 Reserve Stock

For meeting emergent situation reserve stock materials shall always remain at disposal at location noted in **Table 10.45.**

Table 10.45: Reserve Stock

S.N.	Location	Material	Quantity
Phase-I			
(a)	At each reservoir	Boulder	2000 cum
(b)		Shingle	1000 cum
(c)		Sand	1000 cum
(d)		E.C. Bags	10000 Nos
Phase-II			
(a)	At right bank of main canals at head regulators	Boulder	500 cum
(b)		Wire crats (3m x 1.5m x 1m)	200
(c)		Wire crats (1.5m x 1.5m x 1m)	200
(d)		Shingle	500 cum
(e)		Sand	300 cum
(f)		E.C. Bags	5000 Nos
(a)	At left bank of main canals at head regulators	Boulder	500 cum
(b)		Wire crats (3m x 1.5m x 1m)	200
(c)		Wire crats (1.5m x 1.5m x 1m)	200
(d)		Shingle	500 cum
(e)		Sand	300 cum
(f)		E.C. Bags	5000 Nos
(a)	Central Stores for each Irrigation Division	E.C. Bags	10000 Nos

(b)		GI Wire 8 SWG	5 MT

10.12.4.2 Reservoir Safety and Maintenance Manual

Based on standard recommended guidelines for the safety inspection of dams/reservoir a manual should be prepared by the project proponents in respect of safety surveillance and monitoring aspects. This should be updated with the availability of instrumentation data and observation data with periodical review. The need for greater vigil has to be emphasized during first reservoir impoundment and first few years of operation. The manual should also delve on the routine maintenance schedule of all hydro-mechanical and electrical instruments. It should be eloquent in respect of quantum of specific construction material needed for emergency repair along with delineation of the suitable locations for its stocking and also identify the much-needed machinery and equipment for executing emergency repair work and for accomplishing the evacuation plan.

10.12.4.3 Emergency Response Organization

The Superintending Engineer under whose administrative domain, the divisions entrusted with work of operation and regulation of Barrage, Main Canal & branches come shall be the Chief Emergency Coordinator (CEC) who will be the overall in charge of planning, execution and coordination of all activities related to the Contingent Plan. The CEC shall be assisted by an Emergency Planning Group (EPG), who shall coordinate with District Collector on the disaster situation and solicit necessary help from district authorities/police department. For carrying out front line activities like mobilizing man and material, pooling of resources and rushing to the emergency zone and take stock of the hazard an Emergency Action Group (EAG) comprising of the Assistant Engineer/Junior Engineer of the division under whose jurisdiction the disaster occurs shall also be constituted.

10.12.4.4 Emergency Response System

The Emergency Response System involves mechanism to generate speedy response action in terms of warning, communication, medical aid etc. Following response system are devised for meeting the contingent plan under the project.

10.12.4.5 Emergency Control Centre

The regulation control room at head regulator of each canal, from where the regulation of main canal shall be carried out, shall be the focal point in case of an emergency as it is from this point disaster to Head works and main canals and branches can be immediately attended. The control room shall be well equipped with well-designed communication system comprising of-

- Wireless/Radio equipment
- Land line telephone/mobile
- Telephone directory of Emergency Response System
- List of base medical facilities hospitals and rehabilitates centre
- Copies of Disaster Management Plan

It shall be the duty of the office-in-charge of Control Centre to receive and transmit information about disaster and seek direction from the Chief Emergency Coordinator and intimate the Emergency Action Group and the EPG once the hazard is declared.

10.12.4.6 Communication System

For successfully enforcing a disaster management plan an efficient and reliable communication system is needed. In view of linear project, for successfully regulating and running of main canal/branches VHF set with 30 meters high mast is being proposed at different places apart from transport equipment in adequate number. From these stations the first-hand report of hazard can be transmitted to emergency control room besides dissemination of information to the EAG & EPG.

10.12.4.7 Emergency Warning and Control System

Based on the report of emergency alert, the emergency is to be notified. The worst hazard zone is the Head Works where any breach/failure can be easily sensed and the first response received immediately. The Electric Hooter/Siren located at emergency control room shall be sounded wherever an emergency occurs. If the nature of hazard is such that public is least affected, no warning shall be disseminated to the public otherwise in the process of notification, the concerned District Collector is informed and public of hazard zone put to alert by appropriate warning system such as sirens/alarms/broadcast etc.

10.12.4.8 Health and Medical Response System

Health personal have a vital role to play in the event of catastrophic hazard and thus they are part and parcel of health emergency plan. There are sufficient number of PHC and dispensaries well interspersed in the area. Thus, immediate treatment to the victim can be timely and promptly provided.

10.12.5 Cost Estimate

The budget for different activities required to be carried out for mitigation and prevention of hazard exclusively from the canals is given in **Table10.46.**

Table 10.46: Cost Estimate for Implementing Disaster Management Plan

S.N.	Particular	Cost (Rs. Lakh)
Phase-I		
1.	Installation of alert system in control room of each pump house, reservoir surplus weir	20.00
2.	Public information system	2.00
3.	Training and miscellaneous	3.00
4.	Setting up of piezometer on down stream of reservoir	30.00
6.	Total Phase-I	55.00
Phase-II		
1.	Installation of alert system in control room and at Head regulator and important CD works	16.50
2.	Setting up of communication system between canal heads and control rooms of reservoirs	3.00
3.	Public information system	2.50
4.	Setting up of a seismic observatory at site	10.00
6.	Training and miscellaneous	3.00
	Total Phase-II	**35.00**

Total Phase-I&II	**90.00**

10.13 WATER, AIR AND NOISE MANAGEMENT PLAN

10.13.1 Control of Air Pollution

10.13.1.1 Impacts on Air Quality

In a water resources project, air pollution occurs mainly during project construction phase. The major sources of air pollution during construction phase are:

- Fuel combustion in various construction equipment, e.g., heavy earthmovers, loaders, drillers, rock bolters, diesel generating sets, compressors etc.
- Fugitive emissions from stone aggregate crushers.
- Drilling and blasting
- Impacts due to vehicular movement

a. Pollution due to fuel combustion in various equipment

The running operation of various construction equipment involves combustion of fossil fuel for running the engine. Normally, diesel is used in such equipment. The major pollutants, which get emitted because of diesel combustion, is SO_2. The PM_{10} emissions are minimal due to low ash content. Based on experience in similar projects, PM_{10} and SO_2 are not expected to increase significantly. Thus, in the proposed project, no significant impact on ambient air quality is expected because of operation of various construction equipment.

b. Emissions from various crushers

The operation of crusher during the construction phase is likely to generate fugitive emissions, which can move even up to 1 km in predominant wind direction. During crushing operations, fugitive emissions comprising of the suspended particulate matter will be generated. There could be marginal impacts to settlements close to the site at which crusher is commissioned. However, based on experience, adverse impacts on this account are not anticipated. The labour camps, colonies, etc. shall be located outside the impact zone (about 1.0 to 1.5 km) of the crusher plant. The minimum distance of NH/SH and river from the boundary of a stone crushing units should not be less than 200m.

c. Impacts due to vehicular movement

During construction phase, there will be increased vehicular movement for transportation of various construction materials to the project site. Large quantity of dust is likely to be entrained due to the movement of trucks and other heavy vehicles. However, such ground level emissions do not travel for long distances. Thus, no major adverse impacts are anticipated on this account.

10.13.1.2 Mitigation Measures

a) Control of Emissions

Minor air quality impacts will be caused by emissions from construction vehicles, equipment and DG sets, and emissions from transportation traffic. Frequent truck trips will

be required during the construction period for removal of excavated material and delivery of concrete mix and other equipment and materials. The following measures are recommended to control air pollution:

- The contractor will be responsible for maintaining properly functioning construction equipment to minimize exhaust.
- Construction equipment and vehicles will be switched off when not used for extended periods of time.
- Unnecessary idle running of construction vehicles to be prohibited.
- Effective traffic management to be undertaken to avoid significant delays in and around the project area.
- Road damage caused by sub-project activities will be promptly attended to with proper road repair and maintenance work.

b) Air Pollution control due to DG sets

DG sets should be located from the consideration of prominent and first prominent wind direction so that on the downwind direction the human habitats are least impacted by the flue gas emissions. The norms prescribed by the CPCB in respect of fixing the minimum stack height for generator, should be strictly complied with. In no case, it should be lesser than the 20% of the under root of generator capacity in KVA added to the height of the building where it is installed. The emission norms in India cover CO, NOx, PM, and HC and are specified based on the number of grams of these compounds present in diesel exhaust when one kilowatt-hour of electricity is generated. These norms have been revised in December 2013 (G.S.R. 771 (E)/ 11thDec 2013 notification), its amendment vide GSR 232(E) dated 31stMarch,2014 and GSR(E) dated 7th March,2016 and have come in force from 1stJuly 2016. These norms are presented in **Table 10.47.**

Table 10.47: Emission limits for DG sets prescribed by CPCB

Power Category	Emission Limits (g/kWh)			Smoke Limit (Light absorption co-efficient per meter)
	NOx+THC or NOx+NMHC or RHC	CO	PM	
Upto 19 kW	≤ 7.5	≤ 3.5	≤ 0.3	≤ 0.7
More than 19 kW up to 75 kW	≤ 4.7	≤ 3.5	≤ 0.3	≤ 0.7
More than 75 kW up to 800 kW	≤ 4.0	≤ 3.5	≤ 0.2	≤ 0.7

c) Dust Control

The project authorities will work in close association with representatives from the community living near project area to identify areas of concern and to mitigate dust-related impacts effectively (e.g., through direct meetings, utilization of construction management and inspection program, and/or through the complaint response program). To minimize issues related to the generation of dust during the construction phase of the project, the following measures have been identified:

- Identification of construction limits (minimal area required for construction

activities).

- When practical, excavated spoils will be removed as the contractor proceeds along the length of the activity.
- When necessary, stockpiling of excavated material will be covered or staged offsite location with muck being delivered as needed during the course of construction.
- Excessive soil on paved areas will be sprayed (wet) and/or swept and unpaved areas will be sprayed and/or mulched. The use of petroleum products or similar products for such activities will be strictly prohibited.
- Contractors will be required to cover stockpiled soils and trucks hauling soil, sand, and other loose materials (or require trucks to maintain at least two feet of freeboard).
- Contractor shall ensure that there is effective traffic management at site. The number of trucks/vehicles to move at various construction sites to be fixed.
- Dust sweeping - The construction area and vicinity (access roads and working areas) shall be swept daily or as necessary to ensure there is no visible dust. Kutcha surface / earthen roads shall be sprinkled with water twice a day.
- Dust mufflers shall be provided at batching plants and stone aggregate crushers.
- Stone crusher unit shall install adequate pollution control measures including erection of G.I. Sheets cover and sprinklers before commencement of operation.
- Wind breakers in the form of curtain/wall should be provided at the boundary.
- All conveyor belts shall be hooded or covered by G.C. Sheets.
- Screen classifiers shall be adequately covered by G.C. Sheets

10.13.1.3 Implementing Agency

Various management measures required for control of air pollution need to be included in the Tender Document for the Contractor involved in construction activities. The project proponents shall monitor the same on a regular basis. Considering an expenditure of Rs. 3333/day for 240 working days annually (excluding rainy season of 4 months) for 20 work sites each for Phase-I and II for 3 years, a sum of **Rs. 960.00 lakh** has to be earmarked under air pollution control measures for copious sprinkling for dust suppression.

10.13.2 Impacts on Noise Levels

In a water resource project, the impacts on ambient air noise levels are expected only during the project construction phase, due to operation of heavy earth moving machinery, etc. Likewise, noise due to quarrying, drilling and blasting, vehicular movement will have some adverse impact on the ambient noise levels in the area.

10.13.2.1 Mitigation Measures

The contractors will be required to maintain proper functioning of equipment and comply with occupational safety and health standards. The construction equipment will be equipped with noise suppression devices and properly maintained mufflers.

- Vehicles to be equipped with mufflers recommended by the vehicle manufacturer.
- Staging of construction equipment and unnecessary idling of equipment within noise sensitive areas to be strictly avoided.

- Use of temporary sound fences or barriers with acoustic material at sensitive locations
- Notification shall be provided at a conspicuous place close to residential areas within 100 meter of major noise generating activities. The notification will describe the noise abatement measures that will be implemented.
- Monitoring of noise levels will be conducted during the construction phase of the project. In case of exceeding of pre-determined acceptable noise levels by the machinery will require the contractor(s) to halt work and remedy the situation prior to continuing construction.

The following Noise limits for DG sets (upto 1000KVA), manufactured on or after1st July,2003 have been prescribed by the MoEFCC vide notification, G.S.R 371(E) dated 17th May,2002:

- The maximum permissible sound pressure level for new diesel generator sets with rated capacity upto 1000 KVA shall be 75 dB(A) at 1 m from the enclosure surface.
- Noise from the DG set should be controlled by providing an acoustic enclosure or by treating the enclosure acoustically
- The Acoustic Enclosure should be made of CRCA sheets of appropriate thickness and structural/ sheet metal base. The walls of the enclosure should be insulated with fire retardant foam to comply with the 75 dB(A) at 1m sound levels specified by CPCB, Ministry of Environment & Forests.
- The acoustic enclosure/acoustic treatment of the room should be designed for minimum 25 dB(A) insertion loss or for meeting the ambient noise standards, whichever is on the higher side.
- The DG set should also be provided with proper exhaust muffler with insertion loss of minimum 25 dB(A).
- Proper efforts to be made to bring down the noise levels due to the DG set, outside its premises, within the ambient air noise requirements by proper placing and control measures.
- A proper routine and preventive maintenance procedure for the DG set should be set and followed in consultation with the DG set manufacturer, which would help prevent noise levels of the DG set from deteriorating with use.

10.13.2.2 Mitigation measures of noise from crushers

Based on literature review, noise generated by crushers is in the range of 79-80 dB(A) at 80 m from the crusher. Thus, noise level at 160 m from the crusher shall be of the order of 74 dB(A). The exposure to labour operating in such high noise areas shall be restricted up to 30 minutes daily. Alternatively, the workers need to be provided with ear muffs or plugs, to attenuate the noise level near the crusher by at least 15 dB(A). The exposure to noise level in such a scenario is limited up to 4 hours per day.

It is known that continuous exposure to noise levels above 90 dB(A) affects the hearing of the workers/operators and hence has to be avoided. Other physiological and psychological effects have also been reported in literature, but the effect on hearing has been specially stressed. To prevent these effects, under OSHA Noise Exposure Standards vide Table G-16, has provided a 90 dB(A) criterion for an eight-hour time weighted average PEL and is measured using a 90 dB(A) threshold (i.e., noise below 90 dB(A) is not integrated into the TWA. The table reproduced as

Table 10.31 limits short- term noise exposure to a level not greater than 115 dB (A) for upto 15 minutes

Table 10.48: Maximum Exposure Periods specified by OSHA

Maximum. equivalent continuous noise level dB(A)	Unprotected exposure period/day for 8hrs/day and 5 days/week
90	8
95	4
100	2
105	1
110	0.5
115	0.25 No exposure permitted at or above this level

The workers deployed at such locations where the noise levels are high shall be provided with earplugs. The cost of earplugs shall be **Rs. 4.00** lakh.

10.13.3 Control of Water Pollution During Constructive Phase

During project construction phase, sufficient measures need to be implemented to control the problem of water pollution from various sources. The sewage generated from project colony and various labour camps is proposed to be treated in STP. However, efforts shall be made to discharge the treated effluent only in these water bodies. It is proposed to provide adequate capacity mobile STP for labour colony for which an amount of Rs 7.50 lakh /STP/camp has been proposed. Therefore, cost for establishing STP form 45 camps shall be **Rs 337.50 lakh.**

The construction activities would require a crusher to crush large lumps of rocks to the requisite size for coarse as well as fine aggregates. The effluent generated from these crushers will have high-suspended solids. The effluent needs to be treated before disposal. Settling tanks of appropriate size for treatment of effluent from various crushers should be provided.

Normally, water is collected in the side drains and drained off into the nearest water body without treatment. It is recommended to construct a settling tank of adequate size to settle the suspended impurities. The sludge from the various settling tanks can be collected once in 15 days and disposed at the site designed for disposal of municipal solid wastes from the labour camps. The sludge after drying could also be used as cover material for landfill disposal site. An amount of **Rs.16.50 lakh** has been earmarked for construction of various settling tanks.

10.13.4 Cost Involved Towards Control of Water, Air & Noise Pollution

The cost of mitigative measures suggested for control of water, air and noise is given in **Table 10.49**.

Table 10.49:Cost of Mitigative Measures

S.N.	Particulars	Amount (Rs. Lakh)
1.	Control of air pollution	960.00
2.	Control of noise pollution	4.0

3.	Control of water pollution	354.00
	Total	**1318.00**

10.14 MITIGATING MEASURES DUE TO BLASTING

10.14.1 Introduction

The ground vibrations, noise and fly rock constitute the chief environmental impact of blasting. When an explosive charge detonates, the chemical reaction takes place and the chemical energy is converted into shock and gas energy thereby setting prolific dynamic waves around the blast hole mainly brought by sudden acceleration of stationary rock mass. While a small portion of energy liberated during blasting is consumed in fragmentation of rock mass and fly rock apart from dissipation through ground vibration and air over pressure (noise) heat and light. The ground vibration sets the ground in transverse, longitudinal and vertical direction and which in turn causes the foundation of structure to vibrate in these directions and damage the structures.

Air overpressure is transient impulse, which traverses through the atmosphere, are both audible and inaudible, and have the energy to vibrate a structure alike ground vibration and is much of concern as animals are more sensitive than human being is. This is mainly manifest as energy released from unconfined explosives such as uncovered detonating cord trunk. It is also caused due to various other factors like too small burden, excessive powder factor, insufficient stemming length, incorrect drilling etc., which are controllable if properly addressed by the blaster.

10.14.2 Ground Vibration and Air Overpressure

Ground vibrations are acoustic waves that propagate through rocks. Although the difference in accelerations, amplitude, particle velocities and the frequencies in three directions result into damage to structures but the peak particle velocity and frequency are normally taken into consideration for evaluating the structural response. The various aspects of ground vibration triggered by open cast blasting and consequent-damaging effects on different types of structures is usually computed based on the value of the Peak Particle Velocity (PPV) induced at the foundation of the distant structure. PPV criteria are considered the best predictor for ground vibration caused by blasting. It takes into consideration the total energy of ground motion induced around a blast and is a function of the distance of the location of blast from the gauge point and quantity of explosive per blasting. In case of surface excavation at the dam site the PPV was worked out on the basis of empirical equation contained in IS:6922-1973 based on various empirical formula and compared with the limiting values for dominant excitation frequency less than 8 Hz as prescribed by the Director General of Mines Safety, India (DGMS) in Circular 7 of 1997.It was found to be within the prescribed limit of 5mm/sec for domestic structures in the nearby settlement.

Propagation of blast induced air over pressure was worked out and found to be not alarming. The predicted air over pressure in dB(A) shall be lower due to attenuation and the blasting being carried out at pit level which are lower than the elevation of nearby settlements which are

higher level than the river bed which is subject to blasting on account of rock excavation.

10.14.3 Mitigating Measures

In order to minimize vibration, the following shall be adopted:

- Blast holes shall be initiated by non-electric (NONEL) down-the-hole (DTH) delay detonators.
- Stemming should be strong and adequate length not less than one third length of the hole.
- Blasting should be avoided in early hours of morning and late hours of evening to avoid temperature inversion conditions.
- Blasting may be avoided at time when strong surface winds are blowing towards settlements.
- Flag erection and siren signalling system should be provided during time of blasting for further safety, the blasting time will also be fixed during the end of the shifts that all workers move outside of danger zone.
- Care shall be taken to ensure that effective burden is not excessive and the face shall be kept sufficiently long.
- Optimum charge per delay shall be kept as low as possible.
- Adoption of two row blasting and V pattern of firing
- The firing of maximum possible no. of blast holes towards free face.
- Use of milli-second delay detonators between the holes and rows of blasting.
- All precaution suggested in MMR1961 specially as specified from regulation 162 to 168 must be adhered.
- It should be carried out under the supervision of qualified person/blaster,
- For storage and issue of explosives, the relevant provisions of Indian Explosives Rules,1983 shall be followed.

10.15 GROUNDWATER MANAGEMENT

10.15.1 Introduction

The dependability on ground water in the absence of surface water has exponentially increased in the agriculture sector which accounts for 92% of annual water draft for irrigation. This has led to indiscriminate and wanton abstraction of groundwater resource in the country without regards to recharging capacities of aquifers. The grim situation in some parts of the country has necessitated to adapt to sustainable groundwater strategy for country in holistic manner. There is urgent need for coordinated efforts by various Governments and non-governmental agencies, social service organizations and the stakeholders for evolving implementable plan for effective management of this precious natural resource. The effective management inter-alia includes a combination of supply side measures on the scientific computation of ground water availability and future and the demand side aspects involving measures to control and conserve the available resources for current future demands viewing the population increase. The supply side measure is also called structural measures and are aimed at scientific development and

augmentation of ground water resources through artificial recharge and rainwater harvesting, besides study of hydrologic and hydrologic controls that govern the yields of aquifers and behavior of ground water levels under abstraction stress. The demand side measures call for judicious utilization of resources for ensuring their long-term sustainability through involvement of stakeholders. The highly diversified hydro geologic settings and variations in the availability of ground water resources from one part of the country to other call for a holistic approach in evolving suitable management strategies. The effective management of available groundwater resource requires an integrated approach, combining both supply side and demand side measures.

10.15.2 Groundwater Scenario in Project Area

The dynamic ground water resource potential of the state has been estimated as per the methodology given by the Ground Water Estimation Committee 1997 (GEC 1997). As per the latest estimates (March 2013), the annual replenishable ground water resources are 14744 MCM, natural discharge during non-monsoon period is 1354 MCM, net ground water availability is 13390 MCM. The annual gross ground water draft is 7766 MCM, allocation for future domestic and industrial use is 1554 MCM and net ground water availability for future irrigation use is 4823 MCM. The average stage of ground water development is 58%. Out of 443 mandals, 46 categorized as over-exploited, 12 categorized as critical, 74 categorized as semi-critical and remaining 311 as safe category.

In Mahbubnagar, Nalgonda and Rangareddy districts the number of over-exploited Mandals are 1,5 and 1 respectively. In Mahbubnagar, Nalgonda and Rangareddy districts the number of critical Mandals are 2,2 and nil respectively. In Mahbubnagar, Nalgonda and Rangareddy districts the number of semi-critical Mandals are 19,11and 8 respectively, whereas 42,41 and 28 mandals are in safe category. The categorization of mandals is depicted in **Figure.10.8.**

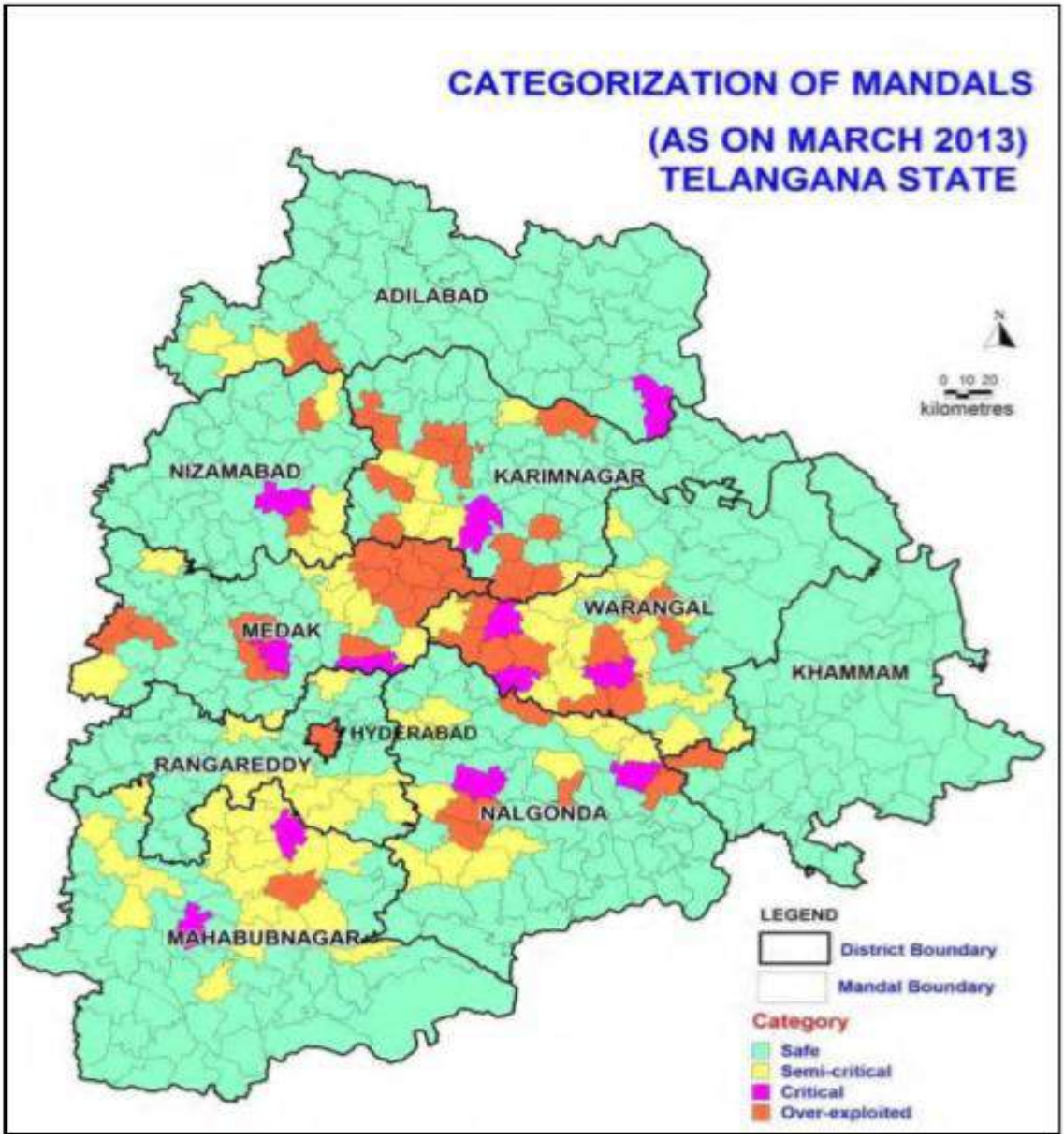


Figure 10.9: Categorization of Mandals (As on March 2013 Assessment)

10.15.3 Dependency of Project on Groundwater

The project per se, does not envisage conjunctive use of ground water. However, the very fact that some chunks in command area at present are being irrigated by harnessing ground water through private tube wells/pump sets, their use cannot be ruled out by their existence per se in the exigency of draught or during rain failure in the catchment area of river as the farmers by choice shall resort to these means to protect their crops though such situation may arise during failure years. The project is for Irrigation during Rabi and Kharif irrigation, the farmers during pre-monsoon will support their otherwise rain fed crops by drawl from ground water through their pump sets. There shall be ground water recharge during field application of proposed canal water. The ground water situation shall improve and shall facilitate easier pumping during April/May for growing Kharif Crops. With the advent of project irrigation, the drawl of ground water shall decrease in the command area during the period, the water is made available in the

canals. As such the groundwater levels will increase and further exploitation will be minimized. After a few years the monitoring programme should be envisaged to study the potential of groundwater and conjunctive management can be planned.

In Mahbubnagar, Nalgonda and Rangareddy districts the number of over-exploited Mandals are 1,5 and 1 respectively. In Mahbubnagar, Nalgonda and Rangareddy districts the number of critical Mandals are 2,2 and nil respectively. In view of this situation conjunctive use of surface and groundwater is the only alternative available. Ground water development in the command area through construction of dug wells/bore wells may be taken up for utilization of ground water resource available and use it in conjunction with surface water to increase the irrigation potential. There is dire need in this area to motivate the farmer's for changing the age-old cropping pattern and irrigation practices. The importance of growing less water consuming crops and shift to modern irrigation methods of micro-irrigation need to be advocated in the area in lieu of the present practice of double crop of paddy and flood irrigation

10.15.4 Ground Water Management

Notwithstanding the fact that the project does not contemplate harnessing of groundwater resource and is covered under the block, which as per groundwater development is in safe category, there is a need to adapt the five essentials as recommendation made to the Planning Commission by Kulkarni et al (2009) in the Mid Term Appraisal (MTA) of the 11thPlan for incorporating into National Groundwater Management Programme:

- Aquifer mapping and delineation.
- Recharge systems and well- use efficiencies aligned to aquifers in any of India's regions
- Groundwater-Energy co-management
- Participatory demand management of aquifers.
- Groundwater legislation

10.15.5 Participatory Groundwater Management

The sustainable management of groundwater is feasible only if users understand its occurrence cycle and limited availability and need to conserve for future for the years when the recharge is low. The Andhra Pradesh Government has taken initiative by implementing Andhra Pradesh Farmer Managed Groundwater System Project (APFaMGS) in the state for improved water use efficiency by empowering farmers in monitoring and managing groundwater resource in their hydrological unit. Under the project the farmers were trained to collect data which were important for understanding the local aquifers, installation of rain gauge and its daily observation, fortnightly measurement of groundwater levels in their well and measurement of pump well discharge and upkeep of data in register. Thus, the farmers can bring their water use in line with groundwater availability. An estimate of the aquifer budget gives the farmer an element on the risk of their cropping systems and provides information in time before the planting of post-monsoon crops. Village-wise participatory groups just on the lines of WUAs shall be formed in the command area of the project and trained for carrying out the activities mentioned.

10.15.6 Groundwater Management Plan

Then plan shall be implemented through the state Water Resource Department in close association with CGWB and the following broad parameters shall be included: and the cost shall be funded by the State and Center

- Aquifer mapping.
- Strengthening of groundwater monitoring observation wells.
- Training and capacity building.
- Participatory groundwater management.
- Groundwater Assessment, regulation, information dissemination etc.

10.15.7 Problem of Fluorosis in Groundwater

Nalgonda district had been affected by fluorosis, a crippling disease which affects bones and teeth due to excessive intake of fluoride-heavy water, for a long time. The high fluoride content in the district is attributed to very low groundwater levels and existence of granites

The high fluoride content in the affected areas is attributed to very low groundwater levels and existence of underneath sheets of granite that are rich in fluoride. Since groundwater remains in contact with these rocks, fluoride dissolves in water, raising the concentration of the compound in it. Some studies say that the fluoride content in these rocks is as high as 1,500-3,200 mg/kg, much higher than the world average of 810 mg/kg.

According to a statement by the Government of India tabled in Parliament, Telangana had 967 fluoride-affected habitations as on April 1, 2015. The state has overcome the problem thanks to Mission Bhagiratha , a flagship programme introduced in the state in 2015, aimed at providing piped safe potable drinking water to every household. Special focus was laid on providing safe drinking water to villages where the fluoride content in the water was high. The mitigation of this problem needs safe drinking water. Under Mission Bhagiratha, the government also built a water treatment plant at a cost of Rs 436 crore to provide safe drinking water to 585 villages affected by fluorosis.

10.15.8 Rainwater Harvesting

In study area besides some Mandals of Nalgonda few mandals of Mahbubnagar, and Ranga Reddy districts also have fluoride content above 1.5mg/l. Further, the quality of groundwater can be improved to some extent if concerted efforts are made to improve the groundwater resources through appropriate groundwater recharge/rainwater harvesting.

It is pertinent to mention here that recharge due to reservoir seepage after completion of the scheme shall be 0.86 TMC ft. (24.42MCM). The estimated ground water seepage from canal section is around 214.42 MCM. It is estimated that the groundwater recharge due to return flow from irrigation in PRLIS Command 416.54 MCM (14.71TMC ft).

Keeping in view the groundwater recharge potential in the project area accruing from

implementation of project, it is proposed to construct some rainwater structures like Check dams and percolation tanks in the areas identified for artificial recharge by the Central Ground Water Board, New Delhi. The unit cost of structures has been based on the cost arrived as per Master Plan for Artificial Recharge to Groundwater in India – 2020.The cost of rainwater harvesting structure has been estimated as Rs1370 lakh **(Table 10.50).**

Table 10.50:Cost of Rainwater Harvesting

S.N.	District	Check Dam		Percolation Tanks		Total cost (Rs lakh)
		Number	Cost @Rs 8 lakh each	Number	Cost @Rs 15 lakh each	
Phase-I						
1	Nagarkurnool	10	80	6	90.00	170.00
Phase-II						
	Mahabubnagar	15	120	10	150.00	270.00
	Narayanpet	10	80	4	60.00	140.00
	Nalgonda	20	160	10	150.00	310.00
	Rangareddy	20	160	10	150.00	310.00
	Vikarabad	10	80	6	90	170.00
Total Phase-II		**75**	**600**	**40**	**600**	**1200.00**
Total Phase-I &II		**85**	**680**	**46**	**690**	**1370.00**

10.16 PUBLIC HEALTH DELIVERY PLAN

10.16.1 Introduction

From the information collected, it has been revealed that no ethnic disease is associated with people of the region but acute dysentery, gastrointestinal problems, acute respiratory infection are common endemic diseases prevalent in the area. The incidence of hypothyroidism has reduced with the mandatory sale of iodized salt in the area. The incidence of Malaria is not there. In each district there are district hospital, Community Health Centre and PHC. The status of existing health facilities available in the area and type of prevailing diseases are given in **Table 10.51.**

Table 10.51:Existing Health Facilities in the Project Affected Area

S.N.	Available Medical Facilities	Types of Diseases prevailing in the area
1	District Hospital/CHC/PHC/sub centers	Respiratory Diseases, Dysentery, Diarrhea, Tuberculosis and Heart Diseases, Hypertension, Viral fevers

It is inferred from the table that lung diseases, diarrhea, bacillary dysentery, and respiratory diseases are common diseases prevalent in the area. Acute bacterial and viral respiratory infections are affecting large number of the people in this zone, which requires advanced medical treatments to reduce the number of incidences. The prevalent diseases observed by the health centers among the local inhabitants of the area are acute respiratory infection, fever, Reproductory tract infection (RTI), scabies, worm disease, ENT, skin diseases, common cold, diarrhea, leuchoria, back pain, accidental cases and eye infection etc. The incidence of fluorosis cannot be ruled out in some pocket of command area mainly in Nalgonda district. Initial health

assessment reveals that there is no specific health hazard in study area

10.16.2 Likely Impacts on Human Health Due to The Project

Construction of the proposed project may cause the following impacts on health of local residents and the work force: -

Fuel and dust emission may cause respiratory problems like asthma for which mitigating measures like wet excavation of exposed surfaces. Frequent water sprinkling at least thrice a day shall be carried out on haul roads in the project activity area. All approach roads to site shall be metaled.

The scheme involves construction of main canal and distribution system. The main canal shall off take from the reservoirs under construction at different levels under Phase -I. The reservoir is filled by stage lifting of Krishna water from Srisailam reservoir during monsoon. During monsoon the water shall be stored in the reservoir and shall be used for Kharif as well as Rabi irrigation in the command. Thus, the reservoir level shall be subjected to slight fluctuation caused by the withdrawal of water. However, localized stagnation in borrow pit areas is expected during construction in some of the areas, which may require sprinkling of anti-bacterial/insecticides to control propagation of bacteria related disease.

The influx of labour-force during construction warrants proper sanitation and hygiene facilities to avoid diseases related to sewage pollutants such as Typhoid, Cholera & Gastroenteritis.

The new environment shall increase the incidence of waterborne disease and migration of people(labour) help spreading the diseases. Thus, it is necessary to provide both preventive and curative measures, controlling both incidences, spread of these diseases.

10.16.3 Proposed Health Management Plan

Based on the impact evaluation following mitigation measures are proposed to be adopted for management of health environment:

10.16.3.1 Awareness Programme

The project authorities should undertake through “Hospital Kalyan Samiti”, various awareness programmes by organizing camps and poster presentation etc. in the directly affected areas to bring about awareness on prevention and control of various diseases such as Malaria, Dengue, Cholera, Gastroenteritis, STD, HIV/AIDS, Cancer etc. Special emphasis should also be given to provide awareness on Family Planning to the local people. Special awareness programmes should be undertaken to explain to people about diseases like Tuberculosis (TB) and Asthma.

10.16.3.1.1 HIV / AIDS

A virus known as Human Immunodeficiency Virus (HIV) causes AIDS. This virus is what destroys the immune system. HIV can also invade the central nervous system causing severe neurological problems. HIV can also invade the central nervous system causing severe neurological problems. It can take up to 10 years after a person is infected with HIV to develop AIDS. An HIV-infected person can look perfectly normal and healthy. In addition, anyone infected with HIV can infect

another person. HIV is spread through certain body fluids, mainly: · Blood, Semen, Vaginal secretions and breast milk. HIV is spread by certain behaviors and/or situations, which *inter-alia* include sexual contact (anal, vaginal, and oral) with infected person, sharing injection equipment, blood or its components and Infected mother to infant. The following measures are recommended for AIDS control:

10.16.3.1.2 Prevention

Awareness programme educating people to enable to make life saving need to be implemented. Intravenous drug users to be informed about the perils of sharing of needles. Use of various modes of media to educate people on AIDS, its nature, transmission and prevention. People in high-risk groups to be refrained from donating blood, body organ, etc. Strict sterilization practiced to be ensured in hospitals and dispensaries. Pre-sterilized or disposable syringes to be used as far as possible.

10.16.3.1.3 Anti-Retroviral Treatment

At present, there is no vaccine or cure for treatment of HIV infection/AIDS. However, drugs that suppress the HIV infection rather than its complications can be used for prolonging the life of terminally ill patients.

10.16.3.1.4 Primary Health Care

AIDS touches all aspects of primary health care, including mother and child, family planning and education. Thus, it is recommended that the AIDS control programme integrate various related issues into country's primary health care system. The AIDS control and awareness programs, developed by National Aids Control Organization (NACO) need to be strictly implemented in the project area as w ell. In addition to primary health care, it is also recommended that the workers should be made aware not to hurt the traditional cultural and regions customs and practices.

10.16.3.1.5 Asthma

Asthma is a long-term (chronic) disease of the airways which are involved in carrying air in and out of the lungs. Its symptoms are caused by inflammation, which makes the airways red, swollen, narrower and extra sensitive to irritants. This leads to recurrent attacks of wheezing, breathlessness, chest tightness and coughing. Asthma does not stay the same, but changes over time and every person with asthma has a good and bad days. However, if asthma is properly treated, one can enjoy long periods without symptoms or attacks. The causes of asthma are not fully understood. Asthma is usually caused by a mixture of hereditary (which a person is born with) and environmental factors.

Allergens from house dust mites and pets are the most common causes, but many other allergens, such as pollen and moulds, can cause asthma. Some patients with asthma have no obvious allergies.

Treatment of asthma requires two types of medicines, preventers and relievers. Preventers are medicines that prevent asthma attacks from starting. The most effective and most commonly used preventer medicines are inhaled glucocorticosteroids. Reliever medicines, like inhaled salbutamol, salmeterol etc., provide rapid relief from an asthma attack by quickly opening the narrowed airways (dilating the bronchi).

10.16.3.1.6 Tuberculosis (TB)

It is a communicable, but curable bacterial infection caused by Mycobacterium tuberculosis. The lungs are primarily involved, but the infection can spread to other organs.

TB is spread through the air when a person with TB in the lungs or throat coughs or sneezes, sending TB germs in the air. When other people breathe in these germs, they may become infected. The primary stage of the infection is usually asymptomatic (without symptoms). Pulmonary TB develops in the minority of people whose immune systems do not successfully contain the primary infection. In this case, the disease may occur within weeks after the primary infection. TB may also lie dormant for years and reappear after the initial infection is contained.

This TB infection becomes 'disease' when the body's defence system is weakened, due to aging, a serious illness, stressful event, drug or alcohol abuse, HIV infection (the virus that causes AIDS) or other conditions. When inactive TB germs become active, they multiply and damage the lungs or other parts of the body and the disease develops. Only about 10% of people infected with TB germs develop TB disease.

10.16.3.1.7 Malaria

Once adult mosquitoes have emerged, the ambient temperature, humidity and rains will determine their chances of survival. To transmit malaria successfully female anopheles must survive long enough after they have become infected (through a blood meal on an infected human) to allow the parasite they know harbor to complete their growth cycle. That cycle takes 9-21 days @ 250 C. Below a minimum ambient temperature (150 C for plasmodium vivax, 200 C for P falciparum) the cycle cannot be completed and malaria cannot be transmitted.

Spray Operation

There shall be regular fumigation, fogging, or sprays of insecticides in the areas where water is likely to be stagnant, to prevent the growth of malarial larvae. As per modified plan of operation SP is required to be sprayed in project area. The requirement of insecticide is as follows:

- SP 5%-37.5 M.T per million populations for two rounds
- SP 10%-18.75 M.T per million populations for two rounds

To undertake the spray operation field workers are required. One squad consisting of one superior field worker and five field workers each spraying squad need two stirrup pumps which will cover 25 t0 30 houses per day per pump

Reduce Exposure to Mosquitoes

Encourage prevention of mosquito-borne disease by helping people by reducing their exposure to mosquitoes during the day and at night. Work with the malaria control programme in the project area to:

- Popularize the use of bed net programme
- Conduct community education on the proper use of bed nets and how to avoid dawn to dusk mosquito bite. Regular spray of insecticides.
- Implementation of various management measures for vector control (drainage, filling, of breeding, sites) as outlined in the earlier section

- Vector Control is still one of the major measures to control malaria in endemic area.

Following measures are recommended:

Anti-Adult Measures

- Residual spraying with insecticides.
- Space application of insecticides in the form of a fog or mist. The method has proved economical due to ultra-low volume dispersion of pesticides in air.
- Prevention of man-vector contact by use of repellents, protective clothing, and bed nets.

Anti-Larvae Measures

- Use of larvicides at regular intervals
- Reduction of mosquitoes breeding sites by drainage or filling, deepening or flushing,
- Introduction of fish species in permanent water bodies which feed on mosquito larvae.

10.16.3.2 Establishment of Project Dispensary

The project proponent shall develop and maintain a dispensary within the project area, which shall have trained staff, equipment and medicines. However, onsite medical facility should also be provided in the labour colonies/camps along with first aid facilities at all the working sites. The capital cost of establishing and development of dispensary at the project site shall be covered under sub head "K-building" in the DPR. The hospital facilities would be available to the staff, workers and local people. Free medicines should be distributed to the identified project affected families who shall be provided with identity cards and to the locals. Provision for ambulances, which will function around the clock, should be made in the DPR, under sub head "Q-spl T & P". Free facilities of ambulance shall be made available to the project affected families (PAFs) and project labourers and for the people meeting accident on the state highway /district roads. Under subhead "O-Miscellaneous", provision has not been earmarked for O & M charges for ambulances and therefore, O & M charges for mobile health van have been included in the plan. The cost of providing free veterinary health services in the project-affected villages shall also be provided in the plan. The project authorities should undertake various health care programmes in consultation with State Health Department such as providing vaccination and other primary health care facilities. Provision of Rs6.0 lac shall have to be made for providing medical assistance like free medicines for labourers, PAF and local people. It is also proposed to provide for chlorination of drinking water in project-affected villages. It is proposed to establish 2 dispensaries for Phase-I works near Narlapur village, Yedula village and 5 for Phase-II works

10.16.3.3 Malaria Control and Vaccination Programme

The borrow pits caused during construction activities, if not reclaimed, provide habitat ground for mosquito population increase and develop the risk of malaria & elephantiasis during rains. However, proper arrangements should be made and implemented for maintaining hygienic conditions in the area. Besides these, arrangements are proposed to distribute medicines and anti-malarial drugs as and when required. Various vaccination programmes shall be arranged periodically as and when required for the locals of the project area.

10.16.4 Bio-Medical Wastes from Hospitals

In view of proposed hospital to be located at proposed permanent colony in the project area, the hospital waste management should be considered a priority. All kinds of hospital waste are considered as hazardous waste. Hospital waste is generated during the diagnosis, treatment or immunization of human beings. It may include waste like scrap, anatomical waste, culture media, discarded medicines, chemical waste, syringes, swabs, bandages, body fluids, human excreta, etc. This waste is highly infectious and can be serious threat to human health if not managed in a scientific and discriminate manner. It is expected that generation of such hazardous waste will be very less. For management, special type of collection container and incinerator should be placed near the hospital for proper collection and disposal of hospital waste. Hospital waste should be incinerated or buried at isolated, identified sites, strictly in accordance with the provisions of the Biomedical Waste (Management & Handling) Rules1998 and amendment,2003. Any kind of hospital waste should not be either recycled or reused. Incinerator/Autoclave is also a legal requirement for hospital waste management so that the non-biodegradable waste generated from colony as well as hospital can be scientifically disposed. One small-scale incinerator must be installed at suitable site in project area for reduction of total volume of non-biodegradable solid waste.

10.16.5 Bio-medical Waste from Dispensary

It is expected that generation of bio-medical hazardous waste will be very less. For management, special type of collection container should be placed near the hospital for proper collection and disposal of hospital waste. The bio medical Waste shall be disposed to Authorized Bio medical Waste Processor. For this a provision of R s1.0 lakh has been kept.

10.16.6 Cost Estimate for Health Management Plan

The details of the expenditure likely to be incurred on the implementation of the Health Management Plan for one dispensary works out to Rs 120 lakhs as shown in **Table 10.52.** The overall cost of running seven such dispensaries in project area shall be **Rs 840 lakh.**

Table 10.52:Budget Estimate of Health Management Plan

S. No.	Particulars	Amount (Rs. lakh)
1.	Free medicines for labours, PAF, local people @ Rs. 3.0 lakh each dispensary per year for 3 years	9.00
2.	Provision mobile health service for 3 years @ Rs. 2.00 lakh/ year	6.00
3.	Capital cost of mobile heath van with accessories	9.00
4.	O & M charges of mobile heath van @ Rs 1.0 lakh/year for 3 years	3.00
5.	Spraying of insecticide @ Rs. 1.00 lakh/year for 3 years	3.00
6.	Health awareness / vaccination camps @ Rs. 2.0 lakh/year for 3 years through District Hospital	6.00
7.	Purchasing medical equipment/ instruments etc. for dispensary and on-site medical facilities like first aid box and medicine kits.	5.00
8.	Cost of one small scale incinerator to be provided at project dispensary	3.25
9.	O & M charges for incinerator @ Rs. 0.25 lakh/ year for 3 years	0.75
10.	Providing Veterinary health service for 3 years @ Rs 1.0 lakh/year.	3.00
11.	Provision for salary of a doctor and para-medical staff (1doctor+I	72.00

S. No.	Particulars	Amount (Rs. lakh)
	compounder+1 nurse= 1ward boy+ 1ambulance driver) @2lakh/month for three years	
Total for one dispensary		**120.00**
Total provision for 2 such dispensaries for Phase-I works		**240.00**
Total provision for 5 such dispensaries for Phase-II works		**600.00**
		840.00

10.17 LABOUR MANAGEMENT PLAN FOR HEALTH AND SAFETY

10.17.1 Introduction

Construction projects, which invariably engaged large number of contract workers, are highly prone to hazards pertaining to site activities. Generally, the workers come from the rural areas and agricultural background and do not have adequate training in construction safety and some time workers from varied trades are drawn into construction activities. Thus, workers are exposed to various risks and occupational diseases and health hazards which sometimes cause grave injuries and prolong illness. Therefore, it is incumbent upon the project proponent to have certain safety guidelines for site activities and create awareness among the workers, supervisors and engineers.

A hydroelectric construction project like any other construction project has significant impact on health and safety during project execution and its operational stage which need to be managed systematically since the project inception. In construction project, the risk is involved to the labour in various activities like excavation on hill slope, excavation, quarrying operation, works related to Electrical and Mechanical components, various activities in workshop and machine halls. The project envisages deployment of workforce to the tune of 600 mainly comprising of skilled/semi-skilled/unskilled workers at the peak construction stage.

10.17.2 Legal Framework For Health and Safety Management

The following Indian standard listed below contains provision for managing Occupational health and Safety Management.

Table 10.53:International standards of Health & Safety

S.N.	IS No	Title
1	15793:2007	Managing Environment, Occupation Health and Safety Legal Compliance – Requirement of good practices.
2	15883 (part-I) :2009	Guidelines for construction project management.
3	18001:2007	Occupational Health and Safety Management System
4	IS 15883 (Part 5)	Guidelines for construction project Management-Health and Safety Management

As per general requirement under OH&S management system the organization (project proponent) shall establish, document, implement, maintain and continually improve an OH&S management system, in accordance with the requirement of this standard. The organization

shall define and document the scope of its OH&S management system.

10.17.3 Health and Management Safety Requirement

The project proponent shall have a written statement prescribing the health and safety policy of the organization. The policy shall convey the management commitment and its intent towards health and safety, its implementing organization and arrangement to ensure that the set objectives are met. It shall also provide a framework for establishing, maintaining and periodically reviewing health and safety objectives and targets. The salient aspects which will be covered in the project health and safety plan are:

- Project specific health and safety objectives, targets and programmes in line with health and safety policy;
- Hazard identification and risk assessment;
- Health and safety organization;
- Resources, roles, responsibility and authority;
- General health and safety rules;
- Health and safety requirements to be followed by sub-contractors;
- Operation control procedure;
- Activities requiring work permit system and its procedure;
- Management of traffic safety inside the project;
- Access control of employees;
- Safety of visitors;
- Management of critical activities such as work a height, material handling and working with plant and machinery;
- Ensuring the competency and awareness of the workmen;
- Fire prevention and firefighting plan;
- Emergency preparedness and response plan;
- Traffic management plan;
- Training matrix; and
- Personal Protective Equipment Matrix.
- Health and safety performance monitoring measures such as Inspection, Audit Incident reporting and investigation procedure

10.17.3.1 Resource, Roles, Responsibility and Authority

Project manager shall define, document and communicate the roles, responsibilities and authorities of all personnel like health and safety officer and supervisor who manage, perform and verify activities having an effect on health and safety risks.

The line management personnel who are responsible for execution of activities is directly responsible for health and safety in the work under their control.

Health and safety officers shall administratively report to the project manager and functionally report to the senior health and safety representative of the organization.

Health and safety supervisors shall be engaged to assist the health and safety officers in

performing their duties.

Management shall provide adequate resources essential to effectively manage the health and safety management system requirements of the project. The resources shall include human resources, organizational infrastructure, technology and financial resources.

10.17.3.2 Competence, Training and Awareness

It shall be ensured that all employees are competent to perform the assigned work safely on the basis of appropriate education, training or experience. Training needs of the different category of employees shall be identified at the beginning of the project and a training matrix and training plan shall be prepared for implementation. The objective of health and safety Training shall be

- to equip the employee with necessary knowledge and skill to perform the work assigned to him in a safe manner;
- to foster continual improvement; and
- to imbibe safety culture.

After completion of training due procedure shall be followed for obtaining the feedback from the participants on the effectiveness of the training.

10.17.3.3 Health and Safety Reporting

Procedures shall be established for timely recording and reporting of information required for continual improvement of health and safety performance. Reporting procedures shall cover:

- Incident reporting
- Non-conformance reporting
- Health and safety performance reporting
- Hazard Identification reporting
- Statutory reporting requirements
- Stakeholder reporting

The recording of reporting of health and safety performance shall be clearly documented in the project health and safety plan

10.17.3.4 Permit to Work Systems

Activities requiring permit to work shall be decided before starting the construction and shall be suitably documented in the project health and safety plan. Some of the activities which may require permit to work are:

- Excavation
- Entry into confined spaces
- Electrical work (HV/LV)
- Opening manholes, covers and grills
- Blasting operation
- Hot work
- Work on plant, machinery and other power-driven equipment.

- Working at height
- Working at night

The project team may establish a permit to work system for any other hazardous activity which they feel need to be controlled administratively for safe execution.

10.17.3.5 Certification of Plant and Machinery, Lifting

Tools and Tackles Lifting appliance such as crane, hoist, derrick, winch, gin pole, sheer legs, jack, pulley block and other equipment used for lifting materials, objects or building worker; lifting gear such as ropes, chains, hooks and slings; and other accessories of a lifting appliance shall be tested and examined by a competent person for the first time. These shall thereafter be tested and examined by a competent person once every year as per the provision of Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and other relevant central and state rules and regulations. Apart from the above statutory testing and examination, project specific procedures shall be established to ensure the fitness of machinery and equipment being deployed at the project for the first time. Regular Inspections shall be carried out to ensure that machinery and equipment continue to be in safe condition.

10.17.3.6 Fire Prevention and Control

Fire prevention measures such as controlling the ignition source and segregation of flammable materials shall be implemented to prevent fire.

Adequate firefighting facilities such as portable first aid fire extinguishers, fire buckets filled with water and sand, water pipelines and hoses shall be established and maintained regularly.

Firefighting arrangements provided shall be suitable to fight the possible type of fire that may occur depending on the type of flammable material. Fire facilities shall be placed strategically such that they are accessible from any location of the site without travelling for long distances. Employees shall be trained on fire prevention and firefighting measures on a regular basis.

10.17.3.7 Access Control

It is advisable to establish access control measures at the construction project to control movement of workmen and visitors. Access control may be achieved by entry pass, bar-coded cards and biometric systems or other suitable means.

10.17.3.8 Safety of Visitors

Visitors for the project shall be given health and safety induction before they are allowed in to the construction project. It shall include the minimum PPE to be used, hazards and risks at the work area, restricted areas of entry, emergency response arrangements, etc.

10.17.3.9 Traffic and Logistics Management

Traffic management plan shall be prepared as a part of the project health and safety plan at the initial stage of the project to manage the traffic inside the project site. Traffic management plan shall include:

- Measures for segregating pedestrian and vehicle traffic;
- Establish project specific traffic rules such as speed limit and one-way etc.;

- Managing the flow of traffic such that blind zones and hazardous junctions are not present;
- Managing the flow of traffic such that reversing can be avoided as far as possible; and
- Use of traffic control devices such as road humps, convex mirrors, delineators traffic signals and barriers. It shall be planned to deploy flag man, security personnel and traffic marshals at critical areas to regulate traffic.

10.17.4 Occupational Health Management Plan

The process of surface and underground excavation leads to some health hazards. The most significant occupational health impacts are Noise Induced Hearing Loss (NIHL) and Occupational Lung Disease (OLD) due to inhalation of dust. Medical examination of employees at the initial stage and periodically, shall be done by a team of qualified medical officers provided by the project proponent. Regular medical check-up camps shall also be arranged for detection of occupational diseases and minor disease in the nearby rural population. Free check-up and medicine for treatment for their acute and chronic illness shall be provided.

10.17.4.1 OCCUPATIONAL HEALTH and SAFETY MANAGEMENT PLAN

10.17.4.1.1 Project Risk of Sand Project Activities

The excavation for the project, by the nature of the activities involved, are accompanied with risk of medium to high degree involving blasting. The risks associated with the project are not hazardous, but if any, they are only accidents and incidents, associated with construction machinery or transportation activity, if adequate controls or safety systems are not adopted. The rock excavation by deploying excavators / JCB/loaders/ rock-breakers besides drilling and blasting and loading on to the trucks by backhoe can have risks of accidents if human failure or errors are not taken care of. The accidents, if any, may not be fatal, but are potential to cause temporary or permanent disabilities. Thus, the need for adequate safety at work places is needed. Some minor incidents like exhaustion, sun-strokes, or other health related incidents may take place, which can be avoided with adequate safety regulations and measures. Transportation of construction material, excavated muck for disposal and crushed stone aggregates to various construction sites are some of the activates associated with accidents on road and at the project site. However, with effective safety measures the accidents can be avoided and prevented.

10.17.4.2 Safety of Machine Use at Project Site

The major machinery to be deployed at site shall be excavators/JCB, Backhoe and loaders which can excavate earth mix with boulders / rock mass and load on to vehicles. The area where machinery shall be operated will be under supervision of trained operators and helpers besides technically qualified foreman to ensure that the machinery is operated as per specified design parameters of the manufacturer. Before the work is initiated every day, the routine check-up especially with regard to its hydraulic systems, mechanical conditions, and other operating systems shall be performed. The movement of trucks/trippers/tractors for loading /transportation of material within the project area and haul road area shall be regulated by a trained supervisor who shall be responsible for the safety of vehicle movement and prevention of accidents or incidents associated with the vehicular movement. All staff working with the

construction machinery shall be trained in first-aid and other safety measures, accident or incident prevention and reporting and communication mechanisms.

10.17.4.3 Occupational Health & Safety (OHS)

The excavated material and construction material does not contain any toxic element. Therefore, the likelihood of any health hazard does not arise due to their handling per se. However, the process of excavation / quarrying leads to some health hazards. The dust generated due to excavation loading and movement on Kutcha/riverbed haul road creates air borne dust which has silica contents. The dust is the main pollutant of concern for the workers engaged in the mining activities. The most significant occupational health impacts are Noise Induced Hearing Loss (NIHL) and Occupational Lung Disease (OLD) like allergic rhinitis and asthma due to inhalation of dust. Working in open during summer can expose workers to the direct sun rays causing heat strokes, cramps and burns besides leading to exhaustion. In extreme windy conditions, the dust particles forcing way into the eyes can create itching as well as allergic conjunctivitis of eye. Medical examination of employees at the initial stage and periodically, shall be done by a team of qualified medical officers provided by the project proponent.

In the present case since the construction period is only for three years. It is suggested that the initial medical examination for all workers must be arranged during the first year of appointment and the periodical check-up of one labour during second and third year. The medical examination schedule is provided in **Table 10.54.**

Table 10.54: Schedule of Medical Check-up

S.N.	Particular	1st Year	2nd Year	3rd Year	Total
1	Initial medical check-up of employees for lung function, audiometric test, tuberculosis and pulmonary disease at the time of appointment	13500	-	-	13500
2	Periodical Medical Check-up of the employees (Audiometric Test, Eye – Check-up, Lung function and respiratory test)	-	6750	6750	13500

Occupational Health & Safety Measures to Control Dust Inhalation

- Providing a working environment that is conducive to safety and health.
- The management of occupational safety and health is the prime responsibility of mine management.
- Employee involvement and commitment in the implementation of health and safety guidelines.
- Periodical health check-ups
- Implementing safety and health management system and assessing the effectiveness through periodic audits.
- Monitoring the effects of mining activities on safety and health and conducting regular performance reviews.
- Provision of necessary personal protective equipment.
- Establishing and maintaining a system of medical surveillance for employees

- Ensuring employees at all levels receive appropriate training and are competent to carry out their duties and responsibilities.

All the above precautions would be adopted to prevent dust generation at site and to be dispersed in the outside environment. However, for the safety of workers at site, engaged at strategic locations / dust generation points like loading and unloading points, screening sieve, dust masks would be provided. Dust masks would prevent inhalation of PM_{10}/$PM_{2.5}$ thereby reducing the risk of lung diseases and other respiratory disorders. Regular health monitoring of workers will be carried out.

10.17.4.4 Noise Induced Hearing Loss (NIHL)

Blasting causes intermittent high level of noises whereas the continuous running of construction machinery / compressors / wagon drills / rock breakers leads to high noise level in the immediate vicinity of the point of noise emission. Hearing conservation programmes exists at all operations. Baseline audiogram forms the basis for future assessment of employees in terms of hearing loss.

Using engineering initiatives to reduce noise at source is the priority management tool. The hearing conservation programme includes the provision of Hearing Protection Devises (HPDs) and annual audiometry examination of all employees. Apart from provision of HPDs emphasis is also laid on training the employees' responsibility to protect his / her hearing.

10.17.4.5 Occupational Lung Diseases (OLD)

There will be regular health camps for all the workers and nearby rural people. Lung function tests, chest X-rays etc. shall be carried out and any health disorders will be evaluated. The budget shall be earmarked for the necessary protective devices and training needs by the project proponent.

10.17.4.6 Cost Estimate

For initial and periodical medical check-up of employee, who are engaged at the active construction site, budgetary provision of Rs. 1500 employee/year shall be made. The cost estimate is provided in **Table 10.55.**

Table 10.55: Cost Estimate

S.N.	Particular	Quantity	Unit	Rate	Amount (Rs. lakh)
1.	Initial medical check-up for all workers	13500	Man	1500	202.50
2.	Periodical check-up for all workers	13500	Man	1500	202.50
3	Provision of medicines	13500	Man	500	67.50
4.	Provision for personal protection equipment like helmets, ear plug, dust mask, shoes, goggles etc., for workers	13500	No.	1000	135.00
Total					**607.50**

10.17.5 Safe Working Procedure

10.17.5.1 DEMOLITION

Before any demolition work is commenced and also during the progress of the work:

- Appropriate warning signs shall be displayed for cautioning persons approaching the demolition area. The area shall be cordoned off properly.
- Before demolition operations begin, the Contractor shall ensure that the power on all electric service lines is shut off and the lines are cut or disconnected at or outside the demolition site. If it is necessary to maintain electric power during demolition operation, the required service lines shall be adequately protected against damage.
- Persons handling heavy materials /equipment shall wear safety shoes.

10.17.5.2 Earthwork in excavation and backfilling:

The Contractor shall take all safety precautions during the execution of awarded work and shall maintain and leave the site safe at all times.

- The Contractor shall ensure the stability and safety of the excavation, adjacent structures, existing services and the works of other agencies.
- Open excavations shall be cordoned off by suitable railing/barricading and photo-luminescent warning signals installed so as to prevent persons slipping or falling into the excavations. Warning signals shall be visible at night also and the area shall be well illuminated during the work.
- All blasting operations, if permitted by Engineer-in-charge, shall be carried out on the basis of procedures approved by Inspector of Explosives. All works in this connection shall be carried out as per I.S Code of Practice. Barricades, photo-luminescent warning signs, etc. shall be placed on the roads/open area. Prior approval of such operation shall be obtained from Safety Officer/Engineer-In-Charge of Works.
- Contractor shall arrange adequate and efficient mechanical dewatering system as recommended by Engineer-in-charge. These pumps shall be inspected and maintained in proper working condition. The electrically operated pumps shall be connected to ELCB of proper rating for safety of the person operating/shifting them.
- Contractor shall wash the wheels, of the transport vehicles carrying excavated soil, with water jet before moving out of the site premises so that there is no spill over of soil on the existing roads. In case there is any such spill over on the roads, the same shall be cleaned by the contractor by manual / mechanical means immediately at no extra cost.

10.17.5.3 Reinforcement and Concrete works:

10.17.5.3.1 Concreting:

- Proper exhaust ventilation shall be available at the cement store and during casting work in confined places. PPE for protection of workers viz. respirators, hand gloves, gumboots, etc. shall be provided by the contractor to the workers handling cement bags and concrete manually.
- The contractor shall provide ear-muffs to the operator / worker exposed to continuous high-level of noise and ear-plugs to all workers involved in the concreting work.
- Wheels of concrete pump / concrete mixer shall be placed on firm ground / platform. Pump accessories shall be checked for its safe working pressure considering maximum pipe line height. A pressure release valve shall be attached to the pump to release the excess pressure.

- The pipeline for transporting the concrete shall have the shortest route with minimum bends and shall be installed on firm supports at suitable intervals. Pipeline shall be properly joined with clamps and securely tied to nearby support and checked in advance before starting the concreting. Pipe segments shall be cleaned in advance to avoid choking of concrete during casting.
- All mechanical equipment/tools used in concreting activity like batching plant/concrete mixer, concrete pumps, vibrators, etc. shall be operated by trained person only.

10.17.5.3.2 Reinforcement:

- Bar bending and cutting yard shall be properly cordoned / barricaded and entry shall be restricted.
- Re-bar bending and cutting machines shall be handled by trained operator / skilled workers.
- Shifting of cut re-bars shall be done by mechanical means as far as possible. When re-bars are shifted manually, it shall be done with proper care and proper balance shall be maintained. Clear access shall be provided for shifting of re-bars.
- Proper support shall be given to the column bars by means of rings / props against undesirable sway.
- Free ends of the binding wires shall be bent inside to avoid injuries.
- Proper PPE viz. leather / cotton hand gloves, goggles, etc., for the people handling / shifting and cutting / tying of re-bar, shall be used for protection from injury and other occupational diseases.

10.17.5.3.3 Formwork for concreting:

- Shuttering and supporting members viz. props, tie rods, etc. shall be of adequate strength to support the load / pressure of concrete and the formwork scheme shall be approved by Engineer-In-Charge in advance. The procedure approved by Engineer-In-
- Charge shall be followed for mixing, transporting and pouring of concrete.
- While removing formwork from vertical surfaces, the shuttering board shall be adequately supported by props, in order to prevent the same from toppling / slipping, until it is lowered on ground safely. Same support with props shall be provided during erection of formwork too until the plywood is secured in desired place with tie rods.

10.17.5.4 Scaffolding and Working at Height

10.17.5.4.1 GENERAL

- All the workers, supervisors and engineers of the contractor, who will work at height, shall have valid height passes issued by the Safety Officer.
- The scaffold to be erected for working at height shall be designed for the estimated load.
- The erected scaffold shall be inspected and cleared by the safety officer of the contractor.
- The scaffold shall be checked for its condition i.e., it shall be free from bends, cuts, rust, etc. All vertical members shall be in plumb and correctly spaced. The joints of vertical and horizontal members shall be properly connected with couplers, lock pins, etc. The scaffold shall be securely tied with permanent structure as per the requirement of IS:3696 – 1991 (Part 1) (Reaffirmed in 2002).

- The working platform and the access to the scaffold shall be free from all debris and loose materials.
- Contractor shall provide necessary PPEs as per relevant I.S. Codes for the workers working at height viz. full harness safety belt, fall arrestor, kinetic shock absorber, safety helmet, gloves, etc.

10.17.5.4.2 Working platform:

- The quality of wooden planks or MS grill plates for decking of working platform shall be made of good quality material and free from any defects, etc. The load carrying capacity of the working platform shall be designed in consultation with Engineer-in-charge. Working platform, gangways and stairways shall be so constructed that they shall not sag unduly or unequally.
- All working platforms shall have guard rails at 1.0 m height with middle rails at 0.5 m height from the platform and 15 cm high toe boards securely tied with the vertical posts.
- The spacing of vertical posts shall not exceed 2.0 m Centre to Centre.
- The contractor shall provide grab rope / life line all around the working platform/level, at height, which will provide tying / anchoring facility for the safety belt / fall arrestor.
- Contractor shall provide safety net under all working platform/level at height to protect fall of men and materials from above and such safety nets shall conform to IS:11057-1984.
- Adequate precautions shall be taken to prevent danger from electrical lines and equipment. Scaffolding, ladder, working platform, gangways, etc. shall not exist within 5m of any un-insulated electric wire. Whenever electric power and lighting cables are required to run through (pass on) the scaffolding or electrical equipment's are used, such scaffolding structures shall have minimum two earth connections with earth continuity conforming to relevant IS Code of Practice.

10.17.5.4.3 Ladder:

- Safe means of access shall be provided to all working platforms and other elevated working places with the help of ladders.
- Ladder shall be placed in an inclination not steeper than 1 in 4 (1horizontal and 4 vertical).
- Every ladder shall be securely fixed at bottom from sliding/slipping.

10.17.5.5 Construction machinery and Tools:

The operation and maintenance of any construction machinery shall be as per manufacturer's guidelines & checklists and by trained personnel only.

10.17.5.5.1 Earth Moving Machinery

The contractor shall ensure the stability of the equipment, while working, depending on the load bearing capacity of the ground; which may reduce due to presence of moisture and due to vibration effect. The contractor shall provide bearing plates, packing, etc. to strengthen the ground below outriggers or wheel or crawler of the equipment. All earth moving equipment shall have Roll Over Protective Structures, sound suppressers, seat belts, reverse alarms, warning horns, windshield wipers and easily approachable control and lever for brake system and emergency stop. They shall be checked at the time of delivery and they shall be properly

maintained. Contractor shall display warning sign for keeping away from the moving parts of such equipment and the area of operation of such machinery shall be properly cordoned. The shovel / bucket of the earth moving equipment shall be rested on ground when the equipment is not working. Operation of such equipment shall always be carried out by trained operator accompanied by the designated helper.

- Bulldozers: The blade of Bulldozer shall be inspected at least once in a week. The blade shall not be used as a brake except in emergency. The position of the blade shall be adjusted while travelling up or down the gradient. The Bulldozer shall be parked on levelled ground, by applying hand brakes and by lowering blade.

10.17.5.5.2 Lifting and hoisting machinery:

- Lifting machines and tackles shall be of good mechanical construction, sound material and adequate strength and free from any defects and shall be kept in good repair and in good working condition. Every rope used in hoisting or lowering materials or as the means of suspension shall be as per manufacturer's guidelines, of good quality and adequate strength and dimension and free from any defect. Test certificates of such ropes, D-shackles, etc. shall be submitted in advance by the contractor.
- Every crane operator or lifting appliance operator shall be properly qualified. No person under the age of 18 years shall be in charge of any hoisting machine or to give signal to operator of such machine.
- The base of such hoisting equipment shall be kept in perfect horizontal condition since any tilt would reduce the load carrying capacity of the equipment. The foundation shall be firm enough to support the equipment. The level shall be checked every day before starting the work in case of mobile hoisting equipment.
- Thorough inspection and load testing of lifting machines and tackles shall be done by a third party, at least once in every 12 months and the records of such inspection and testing shall be maintained and a copy shall be submitted by the contractor to the departmental representative at site. Motors, transmission, couplings, belts, chain drives and other moving parts of hoisting appliances shall be provided with adequate safeguards. Hoisting appliances shall be provided with such means as it shall minimize the risk of any part of a suspended load becoming accidentally displaced or lowered.

10.17.5.5.3 Tower Cranes: Erection & Commissioning

The type of the tower crane to be used shall be selected based on the load to be lifted, the reach of the boom and the height at which the material is to be shifted. The contractor shall follow all the safety instructions given in the manufacturer's manual for erection, dismantling or extension (jumping) of tower cranes. The contractor shall submit the operation manual, provided by the manufacturer, to the departmental representative before erection of the same at site. For both movable and fixed tower cranes, the adequacy of the counterweight shall be ensured. The base of the tower crane shall be in perfect horizontal level. Base shall be capable of bearing the loads during the operation of tower crane.

- Operation – The crane shall never be used to pick the loads which are out of the crane's reach or to do skew pulls of any sort. The load (to be lifted by the crane) shall be free from

any sticky characteristic which may cause sudden jerk while lifting. No worker / person shall be lifted by tower crane. Any kind of swinging of lifted load, to put them out of crane's reach, shall not be tried. The operator shall not reverse the motor in order to achieve quicker stop to save time. He shall execute one operation at a time only and shall never combine horizontal movement of trolley with vertical movement of lifting hook. Tower crane shall be protected from sway due to wind load, etc. during operation. Precautions in high wind load shall be taken as per manufacturer's guide. Various components and parts of the tower crane like wire ropes, pulleys, structural members of the tower and boom, etc. shall be periodically checked and properly maintained by the mechanical engineer of the contractor. Proper lighting arrangement with the boom and the tower of the crane shall be provided as safety arrangements for clear visibility during night. The tower crane shall be provided with the siren / horn facility in order to caution the workers in vicinity during operation of the crane. The operator shall take "START" and "HOISTING" signal from the designated helper / supervisor only; however, "STOP" signal can be taken from anyone.

- Maintenance- The balancing rope, trolley rope, hoisting rope and erection rope shall be checked as per maintenance guidelines given by the manufacturer and they shall be replaced immediately as and when required. For regular maintenance, the manufacturer's manual shall be followed.

10.17.5.5.4 Mobile Cranes:

The contractor shall take care that, the engine of the crane shall be kept running with the gear engaged and maintain a slow speed, while moving down the hill. While travelling uphill or downhill, the boom shall always be kept downhill in order to prevent the boom from falling back. The soil of working area, movement area and parking area of the mobile crane shall be well compacted and shall have proper drainage arrangement. The area shall be dry, levelled and firm enough to hold the load of the mobile crane. The lifting hook shall be tied / anchored while the crane is moving or not operational. Before starting operation at the beginning of day's work, the capacity load shall be picked up to 0.3 m above the ground to test the drift, if any, due to faulty brakes. The brakes shall be 'ON' when a rubber tyre crane is operated. The operator shall always avoid any jerky start or a fast swing during operation of the crane since it increases the risk of overturning of the crane. The pressure in the pneumatic tyre shall be maintained correctly in all wheeled machines.

10.17.5.5.5 Transporting Machinery:

Trucks, tippers, dumpers used in transportation of excavated earth or other materials; which are loaded with mechanical excavators, shovels / loaders shall have strong canopies over the driver's cabin to protect them from injuries while loading. The driver's cabin for all the vehicles at construction site shall have a system of sound and vibration suppression, seat belts, reverse horn/alarm, rear view mirror, wide windshield, triplex glass, wiper, sun visor, etc. Brakes and control shall be designed so as to get locked when the vehicle is parked. While going down the gradient, the speed of the vehicle should be controlled. Hydraulic retarder shall be used for big dumpers. Persons holding valid driving licenses for heavy motor vehicle shall be engaged as drivers of the respective type of vehicles. Every dumper, tipper, truck, etc. shall be accompanied

by helper and driver shall take all signals from his helper only. The access road of such transport vehicle shall be firm and levelled as far as practicable and shall be free from any obstacle.

10.17.5.5.6 Batching plants

The batching plants shall be calibrated by the contractor at least once in a month and such records shall be made available to the departmental staff for record.

The installation, operation, maintenance and decommissioning of batching plant shall be done as per manufacturer's guidelines and manuals. All electrical works and connections shall be done by a licensed electrician under supervision of electrical engineer of the contractor. The DG requirement (in case of power cuts) shall be of at least 150% of the overload capacity. The operations of hopper, scrapper and pan mixer shall be smooth and periodic inspection shall be done as per manufacturer's guidelines. The material bins shall be checked periodically for presence of any boulders, lumps, etc. which may choke in the hopper causing disruption of operation of the batching plant. Proper care shall be taken during feeding cement silo from the bulker for any loose joints in the feeder pipe and pump of the silo. The silo shall have a guarded monkey ladder for access to the top. The person accessing the top of silo shall seek work permit in advance and shall use proper PPE while climbing. The outer surface of the silo shall be properly painted and maintained against weathering effects. The contractor shall make available at least one fire extinguisher near the operator cabin of the batching plant and the same shall be maintained in good condition always. The operator cabin and the scrapper cabin shall be well ventilated and dust proof. The underground water tank/Vat of the batching plant shall be covered with suitable protective cover and shall be cordoned all around.

10.17.5.5.7 Hydraulic machines:

Hydraulic operated machines like mechanical excavators, jacks, or any other hydraulically operated parts, etc. shall be handled carefully. The pressure relief valves mounted on the Hydraulic construction equipment shall not be tampered. These machines shall be equipped with the foam-based fire extinguisher. These machines shall be maintained at regular intervals as per the manufacturer's manual, to avoid failure of brakes, hydraulic system, etc. Regular checking shall be done for such equipment for any leakage, condition of the hoses and connections, etc. Contractor shall give proper training to the operator, mechanic, etc. before they handle the equipment.

10.17.5.6 Dewatering Pumps, Concrete Pumps, Bloom placer pumps

- The rotating parts of the dewatering pump shall be well guarded. Only authorized operator / mechanic shall operate the pump on requirement. He shall not wear any loose clothes while operating the pump. The exhaust of the smoke shall be away from the workers working in the surrounding area. The pump shall be operated and maintained as per the manufacturer's guidelines.
- For electrically operated dewatering pumps including submersible pumps, special care shall be taken while operating them. Such pumps shall be fitted with ELCB of proper rating. The power shall be put off before shifting or removal of the submersible pumps.
- Only authorized operator / electrician shall be allowed to operate the same.

10.17.5.6.1 Stationery Concrete Pumps and Boom Placer pumps:

- The commissioning, operation and maintenance of concrete pumps (both stationery and boom placer type) shall be done as per manufacturer's guidelines or manual provided along with the equipment. The safety procedure and tips as mentioned in these guidelines shall not be violated. A copy of such manuals shall be submitted to the department before installing the equipment at site. Apart from manufacturer's manual, the following guidelines shall be followed for operation and maintenance of the concrete pumps:
- The operation, maintenance and signalling of concrete pumps shall be done by trained and authorized personnel having minimum 18 years of age.
- Place of work shall be so selected that the visibility of batching plant operator/transit mixer driver, concrete pump operator, signal man/supervisor and hose man (at the pouring point) is ensured all at a time. In case such visibility between all the above people cannot be ensured, then at least the pump operator shall be able to see the batching plant operator and signal man separately. The pump operator shall play most key role in pouring and he shall be properly trained by the safety officer/site Engineer of the contractor to understand the signalling process properly in order to ensure smooth concreting activity at site.
- When the concrete is being placed in the hopper of the pump (either from batching plant chute or transit mixer chute), no person shall climb on the hopper of the pump.
- The danger zones (within working area) like hose end position, beneath the placing boom, moving parts of the concrete pump and its hopper, its support legs and the area of the concrete pipe line, etc. shall be identified by the safety officer/ mechanical engineer in advance. Accordingly, these areas shall be cordoned and restricted movement shall be ensured as practicable as possible.
- The concrete pipeline (delivery system) for stationary pumps shall be checked by the mechanical engineer before he seeks work permit for concreting activity, for proper clamping of the pipe joints, supports for pipe line, etc. The pipe line shall have minimum number of bends and shall be straight as far as possible. In case pipe line needs to change the direction, then there shall be at least 5 m straight portion just after the concrete pump. The bends in the pipe line shall be as smooth as possible.
- Inspection interval shall be decided based on manufacturer's guide line, age of the concrete pump, quantity of the operating hours and output of concrete.
- Personal protective equipment like helmet, safety shoes, ear defenders (ear muff/ ear plug), protective gloves and goggles, face mask/respiratory protector, etc. shall be arranged by the contractor for all the workers working on concrete pump.
- Concrete pump shall have suitable pressure relief valve, set at a predetermined pressure level, in order to ensure safety of the workers as well as the pump.

10.17.5.7 Structural Steel Fabrication

10.17.5.7.1 Welding and Gas Cutting

- Welding and gas cutting operations shall be done only by qualified and authorized persons and as per IS: 818-1968 (Reaffirmed in 2008). No hot job shall be done without approved work permit.

- Welding and gas cutting shall not be carried out in places where flammable/any materials such as combustible/flammable chemicals, dyes, hessian cloth, wooden pieces, cylinders, etc. are kept within 10 m from the spot of fabrication or gas cutting.

10.17.5.7.2 Electric Arc Welding

For Electric Arc welding the following additional safety precautions shall be taken:

- All power connections shall be routed through ELCB of proper rating and machine connections shall be through MCB. Double earthing shall be provided to the welding machine. A provision of a separate return path shall be ensured. ii) The cable to be used shall be of adequate capacity corresponding to output of the welding transformer / generator and shall be routed through dry isolated path. Welding cable terminals shall be provided with lugs and connected properly. Proper insulation of cable with insulation tape of approved quality shall be ensured and only double insulated cable shall be used. Extension of welding cables shall be done using standard connectors. iii) Pipe lines carrying flammables shall not be used as part of earth conductor, but a separate earth conductor shall be connected to the machine directly from the job. Painting and Dye Penetration testing shall not be done near electric arc welding. iv) Personal contact with the electrode or other live parts of electric welding equipment shall be avoided. Wires and cables shall not be hung from any metal hook.
- Accidental contact of electrodes with ground shall be prevented.
- The welding cables shall not be allowed to get entangled with power cables. It shall be ensured that the cables are not damaged by movement of materials. Dragging and coiling of cable shall be avoided. vii) For Dye Penetration test, necessary care shall be taken so that there is no hot job going on nearby. Place of the test shall be well ventilated.

10.17.5.7.3 Erection

Only trained operators and workers shall be engaged for the erection of structural fabricated members. For erection by mechanical means, the safety procedures shall be followed in addition to the following guidelines:

- The heavy materials shall not be manually handled. They shall be handled and shifted by mechanical means like crane, hydra, trolley, etc. of adequate capacity.
- All mechanical transport devices and erection equipment shall be operated with the assistance of a helper / supervisor exclusively for proper signalling.
- While erecting fabricated members, suitable guy rope arrangement shall be made to avoid sudden toppling of derrick.
- Chain pulley block, D-shackles and wire ropes (lifting appliances) shall be of rated capacity at least 2.0 times more than the maximum desired load to be lifted. Hooks, jigs and fixtures used shall be marked with their capacities.
- Two or more slings shall be used for lifting the loads and they shall be tied as per the centre of gravity of the load to be lifted.

10.17.5.8 ELECTRICAL SAFETY

Guide lines for providing temporary power supply at the site and general safety procedures for

using electricity are given as under. Following safety requirements shall be complied with before the Contractor uses the power supply.

The Contractor shall submit a list of licensed electrical staff to be posted at site. It shall be the responsibility of the Contractor to provide and maintain complete installation on the load side of the supply point about the safety requirements at site. All cabling and installation shall comply with the appropriate statutory requirements given below and shall be subject to approval of the Departmental Engineer-in-charge/ Electrical Engineer.

- The Electricity Act, 1910 (as amended in 2003)
- Electricity (Supply) Act, 1948
- Indian Electricity Rules, 1956 (as amended in 2005)
- National Electric Code 1985 (as amended in 2005)
- Other relevant rules of Local Bodies and Electricity Boards

10.17.5.9 Fire Safety

The contractor shall take all necessary precautions to prevent outbreak of fires at the construction site. Adequate provisions shall be made to extinguish fires should they still break out.

- Quantities of combustible materials like timber, coal, paints, etc. shall be the minimum required in order to avoid unnecessary accumulation of combustibles at site.
- Containers of paints, thinners and allied materials shall be stored in a separate room which shall be well ventilated and free from excessive heat, sparks, flame or direct rays of the sun. The containers of paint shall be kept covered or properly fitted with lid and shall not be kept open except while using.
- Fire extinguishers suitable for the different classes of fire such as Class A, B, C & D as per IS: 2190-1992 (Reaffirmed in 2010) shall be made available at the appropriate places in the construction site. The date of last maintenance of fire extinguisher shall be displayed properly on the same by using maintenance tag. The fire extinguishers shall be sent for maintenance/refilling at least once in 6 months or whenever exhausted. The safety officer shall inspect the condition of the plunger, safety pin, switch grip, hose tube, etc. at least once in a month and
- report shall be submitted to the departmental representative.
- Adequate number of contractor's workmen and supervisors shall be given training in firefighting and extinguishing methods.
- The safety officer of the contractor shall plan for site evacuation in fire emergency in order to facilitate to easy and safe exits for entire site work force and supervisory staff. He shall identify and train the designated staff or supervisor for specific role in site evacuation plan.
- The telephone number of the nearest fire station shall be displayed at suitable locations (near telephone, main entrance of the site, first aid centre, stores, etc.) in bold distinct font.

10.17.5.9.1 Housekeeping

- The Contractor shall promote and upkeep the practice of good housekeeping throughout the contact period in order to create a safe and hygienic working environment at site. The

contractor shall maintain a separate housekeeping team of workers and supervisors who shall maintain the hygienic conditions at site. He shall at all times, keep his work spot, site office, labour toilets and surroundings and roads clean and tidy from rubbish, scrap, surplus materials and unwanted materials, tools and equipment. The contractor shall follow the recommendation of IS: 4082-1996 (Reaffirmed in 2003) for stacking and storage of construction materials and components at site.

- After the completion of the work, the contractor shall have removed from the work premises all scaffoldings, surplus materials, scrap, rubbish and all temporary structures, huts and sanitary arrangements used/installed for his workmen at site. The contractor shall stack all undesirable materials and debris to the designated area at his own cost, as directed by Engineer-in-charge.

10.17.5.9.2 Common Hazards

- Barricading and Sign Boards: All work areas around excavated pits, trenches, openings, scaffolding, vehicle movement areas, etc. shall be well cordoned / barricaded with the help of railing, safety tapes (photo luminescent), etc. Photo luminescent sign boards and warnings shall be displayed at required locations and they shall be clearly visible from a distance even at low or no illumination.
- Noise: Suitable ear protection (ear muff) shall be provided to the workers, who are exposed to high noise levels (85dBA and above), e.g., concrete pump operator, vibrator operator, batching plant operator, air compressor operator, grinding machine operator, breaking rocks with pavement breaker, etc. The exposure duration in case of these workers shall be restricted. Other workers and staff who are in the close vicinity of high noise level such as unskilled worker engaged in concreting works, etc. shall be provided with ear plugs.
- Area Illumination: Adequate lighting facilities such as flood lights, halogen lamps, hand lights and area lighting shall be provided by the contractor at the site of work, storage area of materials and equipment and temporary access roads within his working area. The intensity of illumination shall depend on the nature of work and the same shall be planned by the contractor in advance based on the recommendations of Hand Book on Functional Requirements of Industrial Buildings (Lighting & Ventilation: SP32-1986).
- Dust and fumes: Adequate measure like dust extractor/arresters shall be available for use to prevent spread of dust to nearby areas during open area operations. Workers shall be rested for sufficient time after everyone hour of continuous working in dust. The same worker shall not be engaged for many days continuously and they shall be engaged/kept on job rotation. All necessary PPEs like dust respirators, safety goggles, hand gloves, ear plugs, protective clothes, etc. shall be provided. Any illness due to continuous work in dust or fume shall be immediately reported to the First Aid Centre.

The cost components for ensuring certain measures for safety of labour during construction have been enumerated in **Table 10.56.**

Table 10.56: Cost Estimate

S. N.	Particular	Amount (Rs. lakh)

S. N.	Particular	Amount (Rs. lakh)
1.	Cost of Barricading work areas around excavated pits, muck disposal sites	15.50
2.	Cost of Caution and Sign Boards	5.00
3.	Cost of Fire extinguishers	4.00
4.	Implements for housekeeping in site offices and work site	18.00
5.	Illumination facilities in work area	70.00
	Total	**112.50**

10.17.6 Cost Estimate For Occupational Health and Safety Management During Construction

The cost components for ensuring occupational health and measures for safety of labour during construction have been enumerated in **Table 10.57.**

Table 10.57: Cost Estimate

S. N.	Particular	Amount (Rs. lakh)
1.	Cost estimate for Occupational Health Management	607.50
2.	Cost of Safety management during construction	112.50
	Total	**720.00**

10.18 SANITATION AND SOLID WASTE MANAGEMENT PLAN

10.18.1 Introduction

During the construction phase of the project, there will be an influx of technical staff, laborers and other service providers into the project area. The proposed project has also envisaged four colonies to house project employees including personnel for other utility services with their families. Sewage and solid waste will be generated from the colonies. It is very essential that from the planning stage, sewerage management and solid waste disposal facilities should be conceptualized to maintain the health of the people and the environment. The main sources of wastes in case of the proposed project can be divided into following categories:

- Municipal waste from residential areas
- Solid wastes from labour camps
- Bio-medical wastes from Dispensary

Since most of the dam operations shall be automated or mechanized, very few people shall be staying in the project during the operation phase. The solid waste is primary problem during the construction phase of the project. Solid waste generated from temporary and permanent colonies in construction as well as operation phase requires special management to disposed of as warranted under the new Solid Wastes Management Rules, 2016.

10.18.2 Responsibilities of Project Authority

The project authority, as principal waste generator, shall, within the territorial area of the project complex/ colony, be responsible for the implementation of the provisions of Solid Wastes Management Rules, 2016, issued by MOEF vide S.O.1357 (E) dated 8th, April 2016, and

for any infrastructure development for collection, storage, segregation, transportation, processing and disposal of municipal solid wastes.

Any municipal solid waste generated in the project complex/ project colony/ labour colony, shall be managed and handled in accordance with the duties set forth under clause 4 (1) through 4(3) and clause 20 in respect of landfill. The management plan has, therefore, been framed taking into consideration compliance criteria against each parameter as set out under Schedule-II, some of which are described in the foregoing paragraphs.

10.18.2.1 Collection of Municipal Solid Wastes

The project authorities shall prohibit littering of solid wastes in the area under their control by resorting to following: -

- Organizing house-to-house collection of solid waste on regular pre-informed timing and scheduling through any of the methods, like community bin collection (Central bin).
- Devising collection of wastes from office complexes, hotels and commercial areas.
- Avoiding mixing of Bio-medical wastes with municipal solid wastes.
- Collected waste from residential areas shall be transferred to community bin by hand-driven containerized carts or another small vehicle. Horticulture and construction / demolition wastes or debris shall be separately collected and disposed of.
- Waste like dry leaves shall not be burnt.
- Collection of wastes from vegetable and fruit shops and meat shops and also dry leaves collected from avenues/ parks, which are biodegradable in nature to be finally disposed of through aerobic composting in composting units of size 8 m x 2.5 m built from bricks. The compost thus obtained shall be used for development of flower beds and avenue plantation around colonies and office areas and also in biological measures to be adopted in respect of soil tips developed at muck disposal sites.

10.18.2.2 Segregation of Municipal Solid Wastes

The project authority shall organize awareness programmes to encourage the generators of wastes and to ensure community participation in waste segregation. For this purpose, regular meeting at quarterly intervals shall be arranged with representatives of resident of colonies.

10.18.2.3 Storage of Municipal Solid Wastes

The project authority shall establish and maintain storage facilities in such a manner as they do not create unhygienic and insanitary conditions around it. Following criteria shall be considered while establishing and maintaining storage facilities.

- Storage facilities of bins shall have ‘easy to operate ‘design for handling, transfer and transportation of waste. Bins for storage of bio-degradable wastes shall be painted green, those for storage of recyclable wastes shall be painted white and those for storage of other wastes shall be painted black.
- Manual handling of waste shall be prohibited. If unavoidable due to constraints, manual handling shall be carried out under proper precaution with due care for safety of workers.

10.18.2.4 Transportation of Municipal Solid Wastes

Vehicles used for transportation of wastes shall be covered. Wastes should not be visible to public, nor exposed to open environment preventing their scattering. Transportation vehicles shall be so designed that multiple handling of waste, prior to final disposal, is avoided.

10.18.2.5 Processing of Solid Wastes

The project authorities shall adopt suitable technology or combination of such technologies to make use of wastes to minimize burden on landfill. Following criteria shall be adopted: -

- The biodegradable wastes shall be processed by composting, vermin-composting, anaerobic digestion for stabilization of wastes in terms of Schedule II
- Mixed waste containing recoverable resources shall follow the route to recycling. Incineration can also be used for processing wastes.

10.18.2.6 Disposal of Municipal Solid Wastes

Land filling shall be restricted to non-biodegradable inert waste and other waste that are not suitable for recycling or for biological processing. Three landfill sites shall be selected as per criteria mentioned under Schedule I (A) and (I) of rules. In terms of clause 21of the rules any non-recyclable waste having calorific value of 1500K/cal/kg or more shall not be disposed on landfills and shall be used for generating energy by giving away as feed stock for preparing refuse derived oil. Before establishing any land fill site ground water quality within 50m of its periphery should be monitored covering pre-monsoon, monsoon and post-monsoon

10.18.2.7 Municipal Waste from Residential Areas

Three permanent project colony for staff shall be created. The colony will have family accommodations. The total expected population in each project colony would be 100 persons. In the colony, use of plastic bags be discouraged and use of biodegradable cotton and jute bags be encouraged. The average solid waste generated in the colony has been assumed to be approx. 0.75 kg [dry-weight]/ per person/day. Thus, the solid waste generated by 300 persons in the project colonies on average daily, weekly, monthly and annual basis is given in the **Table 10.40.**

All households need to be instructed to sort their wastes and store the food, biodegradable and non-biodegradable wastes viz. bottles, cans etc. in separate containers. Two numbers of doorstep waste collectors per house will be arranged and given to each family. A handcart shall be deployed to collect the wastes from the doorsteps daily.

Table 10.58: Solid Waste Generated from Project Colony (kg dry weight)

Garbage Generation	Per Day(kg)	Per Week(kg)	Per Month(kg)	Project period (kg)
Per Person	0.75	5.25	22.5	270.00
By 300 persons	225	1575	6750	202500

The collected biodegradable wastes will be disposed of at a suitable landfill site, to be developed. The area will be properly fenced to avoid animals to feed on the wastes. The organic waste collected will be suitably processed to form compost. The compost thus produced shall be utilized in parks and plantation area around colony. The recyclable (non- biodegradable) wastes

can be collected at a place and can be incinerated at regular interval of time. Apart from this, there will be provision for cleaning the streets of the colony to keep the surrounding area clean.

Considering water requirement of about 100 liter / head / day and on an average a person generates about 80 lit. of sewage per day and therefore, about 24000 lit /day of domestic sewage along with other waste are expected to be generated from the colonies. In the light of the fact that conventional septic tank system, which is too expensive and requires a large volume of water for flushing and is also riddled with problems like periodic cleaning and disposal of sludge, flush compost toilet which requires only 1.5-2.0 litre of water for flushing as against 12 to 14 litre in case of former shall be resorted to. Flush toilet is eco-friendly, technically appropriate, socio-culturally acceptable and economically affordable. Flush compost toilet shall be adopted in residential area. For inspection houses / office areas Thermophilic Aerobic Composter which requires only 6 to 10 days to make compost from any biodegradable waste, without any manual handing during composting shall be adopted. Adequate provision shall have to be earmarked under the sub-head "O-Miscellaneous" as the capital cost of sewerage disposal and storm water drainage and O & M charges respectively.

10.18.3 Solid Waste from Labor Colony

About 13500 workers (Phase-I:7500; Phase-ii: 6000) would be engaged temporarily during peak construction period. Since the construction work under Phase-I is not limited to one complex and is to be carried out in different packages belonging to different contractors, each contractor shall establish his own labour camp to provide residential and bachelor accommodation to labours. Considering about 70% of labour is available locally, arrangement for labour camps has to be done for about 2300 labours.it is proposed to provide 20 labour camps for Phase-I works with on an average 115 workers in one labour camp. It is proposed to provide family residences to 25 workers while the balance 90 shall remain in bachelor accommodation. Proper care has to be taken to manage the solid waste generated from the labour colony for a population of 190 (25x4+90) and 10 floating population i.e., for 200 persons.

Under Phase-II, the canal work shall be longitudinally stretched, the construction labour shall be moving from their camps to the work sites which shall be changing with time and space. For ease and facilitating works it is proposed to house the labour in camps, and for complete project it is anticipated that 20 camps shall be established. With the commencement of construction activities, the deployment of labour force comprising of skilled/semi-skilled/unskilled will take place. Considering about 75% of labour is available locally, arrangement for labour camps has to be done for about 1500 labours. it is proposed to provide 13 labour camps for Phase-II works with on an average 115 workers in one labour camp. It is proposed to provide family residences to 25 workers while the balance 90 shall remain in bachelor accommodation. Proper care has to be taken to manage the solid waste generated from the labour colony for a population of 190 (25x4+90) and 10 floating population i.e., for 200 persons. Thus, for the entire projects 33 camps have to be established and managed.

It is estimated that total solid waste generation per day by labour population residing in one labour colony would be approximately 150 kg dry weight. This would be to 4500 kg dry weight, and 54000 kg dry weight per month and per annum respectively. For maintaining the cleanliness

of the labour colony and to restrict from disposing the solid waste into the river, this solid waste management plan has been formulated. No dumping of solid waste should be allowed near any water body or nalla. For solid waste collection 2 iron storage vats, each of 5 cum capacity, will be located at convenient dumping locations in the colonies. Each vat will have the capacity of holding 500 kg dry weight of garbage, which will be emptied at regular time intervals and the biodegradable waste will be transported to the landfill sites. Use of plastic bags need to be totally banned in the labour colony. Periodical awareness should also be provided in order to avoid use of plastic bags.

Proper sanitary facilities would also be provided at the labour colonies. The standard municipal designs for community sanitation facilities in hill areas have been taken into consideration while formulating the sanitation scheme for the labour colony. Flush compost toilets shall be provided for 25 residences of workforce besides two community latrines of five-seated unit each with three bathrooms constructed at appropriate locations at a cost of Rs. 10.0 lakh per unit having a total cost of Rs. 20.00 lakh. The plan has been chalked out for 36 months which include stipulated 30 months and 6 months for pre and post activities. The financial provision for this purpose has been provided in cost estimate for solid waste management in **Table 10.43.**

Generally, from landfill, there is negligible risk for generation of methane, due to the decay of vegetable matters, as it slowly diffuses at low concentration through the covering material. The most serious risk from sanitary landfill is that of pollution from leachates. Hence, the bed of the disposal sites should be covered with an impervious material to ensure that leachate does not lead to soil and water pollution. During long dry periods the surface of a sanitary landfill can become dusty, causing discomfort to locals in and around such sites. Covering of the disposed material would prevent entrainment of fugitive emissions as well. Paper and other material also flies off the landfill area due to wind currents. This often creates a nuisance in the immediate vicinity of the landfill site. The landfill site, therefore, needs to be skirted with wire fence of about 3 m high with paper catchers to avoid fly of papers. Once the landfill operation is complete, the entire landfill site is to be suitably capped by an impervious material like clay. To ward off entries of dogs and monkeys, the landfill site shall have welded wire fencing all around.

Proper provision for water storage in sufficient quantities will be needed to maintain hygienic environment. Septic tanks of appropriate size be constructed and care be taken to avoid mixing of wastewater and sewage with local water body especially during rainy season.

Apart from the municipal solid waste in labour colony of project area, a lot of waste is expected to be generated on account of construction activities mainly consisting of cement bags, iron scrap, packing material, etc. It is expected that most of the iron scrap and packing material would be recycled since it has reuse value apart from monetary values and hence, it is proposed that stipulations should be imposed on suppliers and contractors to take away the scrap and packing materials. Apart from above, substantial cement will be required for constructional works. Since cement is supplied in 50 Kg plastic bags, a large number of plastic bags would require proper disposal through annual public auction with a provision of monthly disposal of such bags. Iron scraps have a resale value and therefore these shall be auctioned to steel re-rollers.

10.18.4 Hazardous Waste from Management

Hazardous waste inter alia includes burnt mobile oil from vehicles and construction machinery and equipment, batteries and like items specified in column (3) of Schedule-I of Hazardous and other Wastes (Management &Transboundary Movement) Rules, 2016.These will be disposed of by auctioning them to the recycling vendors approved by the CPCB or State Pollution Control Board in consonance with Hazardous and other Wastes (Management &Transboundary Movement) Rules,2016. Under the rules, certain responsivities have been rested on the occupier of hazardous and other wastes generator for safe and environmentally sound management of hazardous wastes staring from pollution prevention to safe disposal. Hazardous waste shall be sent or sold by the occupier to an authorized actual user or disposed in an authorized disposal facility only. Occupier shall transport wastes through an authorized or certified transporter to an authorized actual user or to an authorized disposal facility as per the provisions of these rules.

Under the rules, the occupiers of facilities generating hazardous & other wastes may store for a period of not more than ninety (90) days and a maximum quant of ten (10) tons. An area shall be designated as a storage area known as Central Hazardous Waste accumulation area. This is an area where hazardous wastes are accumulated prior to being picked up for treatment, recycling or disposal. A sum of Rs 4.0 lakh has been earmarked for storage and handling of the waste.

10.18.5 E- Waste from Management

E-Waste (Management) Rules, 2016, applies to consumer electrical and electronic equipment listed in Schedule I, including their components, consumables, parts and spares which make the product operational. Electrical equipment (LED/LCD TV sets, refrigerators, air conditioners, fluorescent and mercury lamps) and electronic equipment (Telex, Telephones, Computers, Printers, Cartridges) including their components, consumables, parts and spares mentioned under Schedule-I are covered under the rules.

Under clause 9 (1) of E-Waste (Management) Rules, 2016, consumers or bulk consumers of electrical and electronic equipment listed in Schedule I shall ensure that e-waste generated by them is channelized through collection centre or dealer of authorized producer or dismantler or recycler or through the designated take back service provider of the producer to authorized dismantler or recycler. The collection, storage, transportation, segregation, refurbishment, dismantling, recycling and disposal of e-waste shall be in accordance with the procedures prescribed in the guidelines published by the Central Pollution Control Board from time to time. Implementation of e-waste (Management and Handling) Amendment Rules, 2016 shall be in accordance with the guidelines prescribed by the Central Pollution Control Board from time to time. For properly storage of e-waste before its disposal, as sum of Rs.1.0 lakh has been earmarked.

10.18.6 Cost Estimate for Solid Waste Management

The cost of management plan for one labour camp works out to **Rs 60 lakh**s as shown in **Table 10.59. The** overall cost for forty-five such labour camps shall be **Rs 2700 lakhs**

Table 10.59: Cost Estimate for Sanitation and Solid Waste Management Plan

S. No.	Description	Qty.	Unit	Rate (Rs lakh)	Amount (Rs. in lakh)
1.	Flush composite toilets for labour colony	25	No	0.20	5.00
2.	Community toilet with 5 seats with Effluent Treatment system	2	No	10.00	20.00
3.	Cleaning worker for 3 years (1x 12 x 3)	36	Man months	0.08	2.88
4.	Door step plastic dustbin 40-liter capacity @ 2 No/family including one replacement	100	No	0.005	0.50
5.	Waste collection handcarts	5	No	0.03	0.15
6.	Landfill R&M	LS			6.00
7.	Implements such as. Brooms, spade etc. and R&M	LS			0.50
8.	Anti-malarial and anti-insecticides equipment & spraying material	LS			1.00
9.	Iron storage vat (3.1 m x 1.25 m x 1.25 m)	2	No	1.0	2.00
10.	Maintenance of 1 Trucks @ Rs 0.10 / month for 36 months	36	Truck Months	0.10	3.60
11.	O & M charges of incinerator @ Rs. 1.0 lakh / year for 3years for one incinerator	3	No.	0.50	1.50
12.	Developing simple composting unit with size 7.5 m x 2.2 m, three chambered builds from brick	1	No.	1.00	1.50
13.	Capital cost of one incinerator	1	No.	8..00	8.00
14	Hazardous Waste Management				5.0
15	E-waste Management				1.0
16.	Contingency	LS			1.37
Total Cost for solid waste management in one camp					**60.00**
Total Cost for solid waste management in 45 camps (Phase-I:25; Phase-II:20)					**2700.00**

10.19 LOCAL AREA DEVELOPMENT PLAN

10.19.1 Introduction

Irrigation projects are primarily welfare projects of the state and inter-alia include such works like command area development which bring about overall development of project area. The projects are intended as social welfare measure for meeting ever-increasing demand for increasing in food and fiber production, due to spiral rise in population, along with opportunity for opening vista of employment in rural areas by harnessing the available water resources to the optimum. The irrigation works are neither profit making nor these are planned as revenue generating to the state exchequer. Due to provision under O.M. F.No.22-65/2017-IA.III, dated 30th September,2020, the provision under OM dated May 01,2018 and OM dated 22.6.2018, are not attracted now and the development works shall be incorporated under local Area Development Plan instead of CER Plan

10.19.2 Main Issues Raised in Public Hearing

Environmental Public Hearing was conducted by Telangana State Pollution Control Board on

10th August, 2021 simultaneously in six districts namely Mahabubnagar, Nagarkurnool, Rangareddy, Vikarabad, Nalgonda and Narayanpet Districts. The issues raised during each public hearing has been summarised in sub section 7.3.1 through 7.3.6 of this report. The gist of issues raised and the replies of the project proponent are described in Table 7.1 through Table 7.6 of the report. Nonetheless, the main issues raised in brief are brought out hereunder:

- Adequate amount of compensation.
- Compensation for land to be released at the earliest.
- Construction of small check dams, rainwater harvesting pits to increase the ground water level
- Promotion of solar energy in villages.
- Facility should be provided for fisheries development in the area.
- The cattle may be provided for development of Women Associations.
- Empowerment of Women.
- Plantation in the area specially along the canal.
- Facilities should be provided to farmers for drawing water from the borewells

10.19.3 Activities Proposed Under Plan

As large-scale investment is being made in the area by way of construction of project, benefits should reach to the local population so that there is remarkable improvement in their quality of life. Provisions will be made by the project proponent for the infrastructure development programme in the project area as per the needs of the local population. Thus, the proposed strategy should be formulated by keeping in view the existing facilities and giving due consideration to the views of the local people.

10.19.4 Cost Under Local Area Development Plan

As per provision under O.M. F.No.22-65/2017-IA.III, dated 30th September,2020, such concerns raised during public hearing which were committed for addressal by the project proponent, after deliberation on the commitment and prescribed as a specific condition while recommending of EC, shall be addressed/undertaken for implementation by the project proponent under Local area Development Plan. Since no expenditure can be incurred, without an approved budget for it, the tentative cost likely to be debited to project has been assessed (**Table 10.60).**

Table 10.60: Budget Estimate for Local Area Development Plan

S. N.	Description	Quantity	Unit	Rate (Rs. Lakh)	Amount (Rs. Lakh)
Phase-I					
1	**Health Care**				
(i)	Supply of hospital equipment to CHC/PHC /PHSC	1	Job	L.S.	30.00
(ii)	Supply of Haemodialysis Machine with RO	2	No.	18.00	36.00

S. N.	Description	Quantity	Unit	Rate (Rs. Lakh)	Amount (Rs. Lakh)
	System one each in district hospitals				
2	**Education**				
(i)	Support for infrastructure development in village schools	40	No.	0.50	20.00
(ii)	E-learning in schools	20	No	0.60	12.00
3	**Infrastructure Development**				
(i)	Providing 15 Watts Solar Street Light @20 in each of six affected villages	120	No.	0.30	36.00
(ii)	Strengthening of existing road network	1	Job	LS	100.00
(iii)	Assistance to weaker farmers for adopting drip irrigation	50	No.	0.50	25.00
4	**Sanitations and drinking water facilities**				
(i)	Iron Storage Vat (3.1m x 1.25m x 1.25m)	30	no.	0.30	9.00
5	**Skill Development and Training**				
(i)	Vocational training like goat rearing/poultry rearing	1000	man-days	0.03	30.00
(ii)	Promotion of self-help groups by proposing livelihood activities in goatry, poultry, bee keeping, tailoring.	6	No.	3.00	18.00
(iii)	Women empowerment by way of training in Kitchen Garden sewing and providing kits	200	No.	0.10	20.00
6	**Environment Enhancement**				
(i)	Plantation in Village Panchayat	12	ha	5.00	60.00
(ii)	Horticulture development in Village Panchayat	6	ha	3.00	18.00
(iii)	Rain water harvesting structure	12	No	3.00	36.00
Total Phase-I					**450.00**
Phase-II					
1	**Health Care**				
(i)	Supply of hospital equipment to CHC/PHC /PHSC	1	Job	L.S.	100.00
(ii)	Supply of Haemodialysis Machine with RO System one each in district hospitals	6	No.	18.00	108.00
(iii)	Supply of Neo Natal Ventilator	6	No.	20.00	120.00
2	**Education**				
(i)	Support for infrastructure development in village schools	1030	No.	0.50	515.00
(ii)	E-learning in schools	500	No	0.60	300.00
3	**Infrastructure Development**				
(i)	Providing 15 Watts Solar Street Light @30 in each mandal	2100	No.	0.30	630.00
(ii)	Ayacut roads and strengthening of existing road network	1	Job	LS	700.00
(iii)	Construction of Market sheds	70	No.	5.00	350.00
(iv)	Assistance to weaker farmers for adopting drip irrigation	250	No.	0.50	125.00
4	**Sanitations and drinking water facilities**				

S. N.	Description	Quantity	Unit	Rate (Rs. Lakh)	Amount (Rs. Lakh)
(i)	Providing flush composite toilet	100	No.	0.30	30.00
(ii)	Iron Storage Vat (3.1m x 1.25m x 1.25m)	300	no.	0.30	90.00
5	**Skill Development and Training**				
(i)	Vocational training like goat rearing/poultry rearing	5000	man-days	0.03	150.00
(ii)	Promotion of self-help groups by proposing livelihood activities in goatry, poultry, bee keeping, tailoring.	25	No.	3.00	75.00
(iii)	Women empowerment by way of training in Kitchen Garden sewing and providing kits	920	No.	0.10	92.00
6	**Environment Enhancement**				
(i)	Plantation in Village Panchayat	50	ha	5.00	250.00
(ii)	Horticulture development in Village Panchayat	35	ha	3.00	105.00
(iii)	Rain water harvesting structure	70	No	3.00	210.00
Total Phase-II					**3950.00**
Total Phase-I &II					**4400.00**

10.20 ENVIRONMENTAL SAFEGUARDS DURING CONSTRUCTION ACTIVITIES

10.20.1 Introduction

The state is endowed with bounty of natural environmental assets such as forests, wildlife, clean air, fertile land, mineral reserves and human resource etc. The construction of irrigation project entails consumptive use of natural resources and cause their and depletion. Due to large – scale anthropogenic intervention in construction projects, the pollution gets accumulated in the eco-system and deplete the environmental stock. Therefore, it is imperative that the project proponent need to manage the flow of environmental services and minimize the depreciation of the environmental attributes to remain sustainable in the long run. This can be accomplished efficiently if the identified adverse impacts are mitigated *pari-passu* with the construction stage. on this count, it is legitimate to follow the environmental safeguards during construction.

10.20.2 Construction Related Impacts and Consequent Safeguards

Management of construction-related impacts would be the responsibility of the project proponent (through its contractors, as and where relevant, and as described in the EMP). The plans for managing the construction site impacts include plans and guidelines for managing and restoring the borrow area and muck disposal sites (including advance protection measures for the sites, before muck is disposed in these sites), management and reinstatements for the quarries, management of effluent discharge, management of safety and health issues, and a chance find procedure for conservation of cultural properties. These measures are described in detail in the EMP, and in the supporting environmental documents. Supervision and monitoring will be essential to ensure full implementation of the detailed plans. These arrangements have been described as part of the EMP.

10.20.2.1 Safeguard from Pollution from Labour Camps during Construction Phase:

The aggregation of labour population and technical staff during construction phase is likely to put significant stress because of discharge of sewage, solid wastes and other pollutants. The total population due to congregation of work force and their families during construction phase is expected to increase the local population significantly. This is likely to affect the existing infrastructure. Thus, the EMP has identified several measures to be implemented to maintain the facilities in labour camps, sanitation and sewage treatment facilities, solid waste management, and provision of community kitchen.

10.20.2.2 Safeguard from Land Degradation and Pollution from Road Construction:

In undulating terrain, road construction often generates significant quantity of wastes (muck) due to the stripping of the rocks to make way for the roads. The stripped muck is generally cleared by dumping the material along the slopes. These dumped materials finally flow down to the valleys and ultimately find way in to the river. The EMP includes measures so that the stripped material would be collected and dumped in the designated muck disposal areas, protection against erosion, and bio-engineering measures to protect the road slopes

10.20.2.3 Safeguard related to Muck Disposal:

For managing quantity of muck to be generated by the project, a muck disposal plan has been prepared. The plan includes, over and above reuse of such part of the muck which has the property to be used as aggregate for c.c. works and as well as in casing and cut-of trench as construction material for the project, site protection and rehabilitation measures which includes civil works, vegetative measures, fencing and planting.

10.20.2.4 Safeguard and control of air pollution, noise pollution and water pollution.

Due to excavation as well as stone crushing activities, there shall be increase in the ground level concentration of the ambient air quality particularly PM_{10}. There will be temporary increase in the noise levels at the project site. Crusher will have cyclone, and particulate filters. Workers would be provided with effective personal protective gears such as masks, ear muffs or ear plugs. Equipment and machinery should be maintained regularly to keep the noise generation at the design level. Silencers and mufflers of the individual machinery are to be regularly checked. The sewage generated from various labour camps shall be treated in septic tanks before disposal by discharging into the river. The septic tanks shall be located so as not to pollute the drinking water sources. Settling tanks of adequate size to settle the suspended impurities will be constructed. The sludge from the various settling tanks can be collected once in 15 days and disposed at the site designed for disposal of municipal solid wastes from the labour camps. During construction stage, periodical environmental monitoring of ambient air quality and noise and water quality from different sources has been planned and incorporated in the relevant management plan.

10.20.2.5 Safeguard against Physical Cultural Resources

The project area does not have known archaeological or historical sites or remains. This has been confirmed by a field based archaeological examination of the project area.

10.20.2.6 Safeguard for involuntary land acquisition

For construction of project, private land shall have to be acquired. The land requirement for various components of the project have been in sync with the dimensions determined on the basis of detailed hydraulic as well as structural design. Some quantity of the muck generated has been proposed for consumptive use for construction material thereby implying minimization of land required for muck disposal site as well as borrow sites, which shall be located in the submergence area. Thus, to keep the land requirement to the minimum, an all-out effort has been made. on the basis of the primary and secondary data collected in respect of the project affected families a draft R & R Plan has been formulated in consonance with the principles enunciated in "The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013", which has come into force from 1-1-2014, notified by Government of India.

10.20.2.7 Safeguard against Loss of Forests

There will be loss to the existing flora coming within the submergence area as well as other project components. As a safeguard measure, green belt development and reservoir rim treatment plans have been formulated as per the requirement.

10.20.3 Road Construction

The project construction would entail significant vehicular movement for transportation of construction machinery, construction material, muck disposal. To execute the various civil works, roads would be made for linking the work site to other sites and to job facility areas. Most of the access roads connecting to the project components shall be black topped while the temporary roads for the river quarry shall be WBM roads. About 50 km roads are envisaged.

10.20.4 Impacts Due to Construction of Roads

The construction of roads can lead to the following impacts:

- Construction of new roads increases the accessibility of a hitherto undisturbed areas resulting in greater human interferences and subsequent adverse impacts on the ecosystem.
- Air pollution increase during construction phase.

10.20.5 Management Measures

The approach roads will have to be constructed as a part of the access to the construction site. Road construction may result in loosening of soil/rock at places and give rise to landslides particularly due to seepage water. The other erosion hazard is that of surface erosion of the bank, which is best controlled by vegetation. The various aspects to be considered while making the project roads are briefly described in the following paragraphs.

10.20.5.1 Construction

The clearing area shall be properly demarcated. Where erosion is likely to be a problem, operations shall be so scheduled and performed that grading operations and permanent erosion

control of features can follow immediately thereafter, if the project conditions permit; otherwise, temporary erosion control measures shall be provided between successive construction stages. The method of balanced cut and fill formation shall be adopted to avoid large difference in cut and fill quantities.

The cut slopes shall be suitably protected by breast walls, provision of flat stable slopes, construction of catch water and intercepting drains, treatment of slopes and unstable areas above and underneath the road, etc. Excavated material shall not be thrown haphazardly but dumped at designated dumping sites. The access roads leading to dam shall be black topped while the roads in the borrow area site and muck disposal site shall be kuccha roads.

10.20.5.2 Drainage

- All artificial drains shall be linked with the existing natural drainage system.
- Surface drains shall have gentle slopes. Where falls in levels are to be negotiated, check dams with silting basins shall be constructed and that soil is not eroded and carried away by high velocity flows.
- Location and alignment of culverts shall also be so chosen as to avoid severe erosion at outlets and siltation at inlets.

10.20.5.3 Grassing and Planting

- Tree felling for road construction/works shall be avoided wherever possible.
- Afforestation with suitable species will be attempted and sustained along the roadside to a sufficient distance on either side of the road.

10.20.5.4 Other measures

- Water will be sprayed regularly during construction phase of the roads to prevent entrainment of dust.
- Regular compaction of temporary roads shall also be carried out

10.20.6 Budget

An amount of **Rs 350.00 lakh** has been earmarked for implementation of measures to mitigate adverse impacts due to construction of unpaved approach roads of 70 km length (Phase-I :20km; Phase-II:50km). The details are given in **Table 10.61.**

Table 10.61: Details of Expenditure for Implementation Measures for Management of Impacts

S. No.	Item	Cost (Rs lakh)
1.	Vacuum Clearing and grubbing @ Rs.0.50 lakh /km/year for 70 km	87.50
2.	Provision of water for spray @ Rs. 1000/tanker for 42 tankers per day for a construction period of 300 days/year for 3 years	378.00
3.	Providing Revetments and Breast walls	48.50
	Total	**514.00**

10.21 ENERGY CONSERVATION MEASURES

10.21.1 Introduction

The execution of the project and appurtenant works there under have been proposed to be carried out contractually to be completed in 36 months' time. About 13500 workers (Phase-I:7500; Phase-II:6000) would be engaged temporarily during peak construction period. Considering about 66.66% of labour is available locally, arrangement for labour camps has to be done for about 4500 labours. Infrastructure facilities shall be developed *pari passu* with the construction activities. As the Government intends to carry out construction on top priority so that benefits from the project accrue fast to the people the construction work shall be carried out simultaneously for main canals/branches/distributaries. The construction work is not limited to one complex. For Phase-I works it is spread over six reservoirs at different locations and also water conductor system involving open canals and tunnels. In respect of Phase-II the canal work shall be longitudinally stretched, the construction labour shall be moving from their camps to the work sites which shall be changing with time and space. For ease and facilitating works it is proposed to house the labour in camps, and for complete project it is anticipated that 45 labour camps (Phase-I:25; Phase-II:20) shall be established. The temporary labour camps will be established at suitable location in the project area. The fuel need of the labourers/ workers has to be attended in an organized manner otherwise the labour may resort to indiscriminate felling of trees and shrubs owing to their cost free and easy availability at leisure. Consequent deforestation if continued shall adversely affect the ecosystem; therefore, pre-emptive action plan has to be devised to meet the fuel needs of workers especially those residing in the labour camps. These objects can be best accomplished by mandatory banning of the use of fuel wood in the labour camps besides complying with the following obligatory steps:

- In every contract document, mandatory clause should be made for the contractors to provide community kitchen facilities to labourers who reside without family and to ensure supply of LPG fuel to the labourers living with families in camps failing which the contractor shall solely be held responsible and liable for penalty and or remedial action.
- Providing free electricity for domestic purpose to the labourers residing in labour camps.

10.21.2 Alternate To Fuel Wood

The fuel shall be required by the labour for cooking purpose, warming the rooms during cold months and also for warming water. In natural course, if the workforce is allowed to manage these at their will, the first choice shall be the free and readily available natural and conventional resources i.e., fuel wood. Thus, pressure due to immigrating labour using fuel-wood extracted free from the local forest shall increase in alarming proportion which may lead to complete denudation of forest in nearby pockets. Therefore, to avoid immediate pressure for fuel-wood in the adjoining forest and consequential increased production of carbon emission it is proposed to use LPG for cooking and electricity for lighting in the camps.

10.21.3 Scheme For Substitute Fuel to Labourers

Under this scheme, a practical work plan has been prepared for implementing the subsidized fuel scheme for the work force of the project. It is proposed to provide LPG connection for cooking, kerosene and electricity for heating purposes. The supply of LPG and kerosene can be ensured on regular basis through written arrangement with local LPG/kerosene suppliers for

supply of the same.

10.21.3.1 Provision for LPG for One Labour Camp

One labour camp shall be manned for 100 workers of which 25 workers shall reside with their families and rest 75 in bachelor accommodations like dormitories/ field camps. The requirement of gas cylinder per month has been worked out based on one cylinder per month for workmen living in family accommodations and one cylinder for a group of 3 workers living in dormitories/ labour camps. The total requirement of LPG cylinders for 36 months which include stipulated 30 months and 6 months for pre and post activities, i.e., @ 50 cylinder / month and 1800 for entire period execution period.

10.21.3.2 Provision for electricity for one labour camp

Electricity supply should be arranged for lighting purpose and provision of street light should be made in the labour colony at the contractors' cost. However, use of LED should be encouraged from the consideration of saving of power and economy. The electricity for domestic purposes shall be provided at one (01) unit/day for each of 75 workers residing in bachelor's accommodation and three (03) unit/day for each of 25 workers residing in family accommodations. Thus, the total consumption per day on this count shall be 150 units and for street light 25 units, the overall consumption during 36 months shall be 2,16,000 units.

10.21.3.3 Energy Conservation Devices for One Labour Camp

With a view to conserve electrical energy, wherever possible, it is proposed to resort to solar lighting system for street lighting / park lighting etc. Besides this, the workers shall be discouraged for using conventional electric bulb/florescent tube lights, which consume more wattage. For this, the workers shall be encouraged to use energy saving lighting devices like LED Bulbs, which shall be provided at subsidized rates to the workers. The usage of pressure cookers should also be encouraged as option to save energy. Solar water heater in dormitory of labour shall be used for supply of hot water during winter.

10.21.4 Debitable Cost of Providing Fuelwood Substitute

The difference in cost of using fuel wood and other suggested substitutes which the contractors shall be loading in their tendered rates and which finally shall be debited to the cost of project has been assessed to the tune of **Rs. 20.00 lakh** as is shown in **Table 10.62.** Thus, the overall cost of the plan for forty-five camps established for the entire project shall be **Rs 900 lakh.**

Table 10.62: Cost of providing fuel wood substitute

S. No	Item	Unit	Estimated Consumption			Rate (Rs.)	Cost (Rs. lakh)
			Per day	Per month	Project period		
A	Conventional Fuel wood @ 1.5 kg/person/day	Quintal	2.25	67.50	2430	600	14.58
B	Alternate fuel						
1	LPG	Cylinder	1.67	50	1800	850	15.30
2	Kerosene stoves.	Liter	17.25	525	18900	15	2.84
3	Electricity	Unit	175	5250	189000	5.60	10.58

S. No	Item	Unit	Estimated Consumption			Rate (Rs.)	Cost (Rs. lakh)
			Per day	Per month	Project period		
Sub Total (B)							28.72
C	Difference between conventional and alternate cost	-	-	-	-	-	14.14
D	Providing LED Bulbs and pressure cookers at 80% subsidy to workers	-	-	-	-	-	0.50
E	Providing Solar Street Lighting (SL7- 15 Watts Solar Street Light)	Nos.	-	-	15	30000	4.50
F	Providing Solar Water heater (200-liter capacity) complete with erecting cost	Nos.	-	-	3	35000	1.05
Total for one camp							**20.19**
Say							**20.00**
Total for such 25 camps for Phase-I							**500.00**
Total for such 20 camps for Phase-II							**400.00**
							900.00

It is thus eloquent from the table that the additional cost due to application of alternate fuel to fuel wood due to environmental constraint shall be attributed to the environment management of the project under provision for substituted fuel. The cost is inconsequential when compared to the loss of 300 trees, which would have been cut for meeting the fuel wood requirement. The assessment is based on very conservative approach by adopting conversion factor of 3.6 Qtl/cum and the cubical content of a tree as 3 cum. per tree. This implies that for one labour camp, on the assumed average stock density of 100 trees per ha, in all 2.26-ha forest area would have to be sacrificed for this purpose. Therefore, for forty-five camps established for the entire project, about 102 ha forest have may be sacrificed.

10.21.5 Other Energy Conservation Measures

The following energy conservation measures would be undertaken:

- Efficient work scheduling and methods that minimize equipment idle time and double handling of material.
- Throttling down and switching off construction equipment when not in use.
- Switching off truck engines while they are waiting to access the site and while they are waiting to be loaded and unloaded.
- Switching off site office equipment and lights and using optimum lighting intensity for

security and safety purposes.

- Careful design of temporary roads to reduce transportation distance.
- Regular maintenance of equipment to ensure optimum operations and fuel efficiency

10.22 SUMMARY OF COST

10.22.1 Summary of Cost

The summary of cost estimate of various environment management plans as contained in this report is enumerated below in **Table-10.63.**

Table 10.63: Summary of Total Cost Estimate (Rs lakh)

S.N.	Plans	Phase-I	Phase-II	Total Cost	Capital cost	Annual Recurring					
						I-Yr	II-Yr	III-Yr	IV-Yr	V-Yr	Total
1	Catchment Area Treatment Plan	248.66	00.00	248.66	248.66	0.0	0.0	0.0	0.00	0.00	0.00
2	Command Area Development Plan	00.00	74985.00	74985.00	57945.00	5680	5680	5680	0.00	0.00	17040.00
3	Compensatory Afforestation Scheme	5856.00	00.00	5856.00	5856.00	0.0	0.0	0.0	0.00	0.00	0.00
4	Wildlife and Bio-diversity Management plan	161.00	539.00	700.00	430.00	54.0	54.0	54.0	54.0	54.0	270.00
5	Fisheries Management Plan	1752.00	100.00	1852.00	1813.00	13.0	13.0	13.0	0.00	0.00	39.00
6	Resettlement & Rehabilitation Plan	331592.00	156624.00	488216.00	488216.00	0.0	0.0	0.0	0.00	0.00	0.00
7	Green Belt Development Plan	81.00	2964.00	3045.00	2490.00	111.0	120.0	116.0	105.0	103.0	555.00
8	Reservoir Rim Treatment Plan	270.00	00.00	270.00	215.00	11.0	12.0	12.0	10.0	10.0	55.00
9	Muck Management Plan	2380.00	7125.00	9505.00	9064.00	147.0	147	147	0.00	0.00	441.00
10	Landscape and Restoration Plan	39.00	76.00	115.00	64.00	17.0	17.0	17.0	0.00	0.00	51.00
11	Restoration Plan for Quarry Sites	62.00	76.00	138.00	54.00	28.0	28.0	28.0	0.00	0.00	84.00
12.	Disaster Management Plans	55.00	35.00	90.00	84.00	2.0	2.0	2.0	0.00	0.00	6.00
13	Water, Air and Noise Management Plan	678.00	640.00	1318.00	358.00	320.0	320.0	320.00	0.00	0.00	960.00
14	Ground Water Management	170.00	1200.00	1370.00	1370.00	0.0	0.0	0.0	0.00	0.00	0.00
`15	Public Health Delivery Plan	240.00	600.00	840.00	142.80	232.4	232.4	232.4	0.00	0.00	697.20
16	Labour Management Plan	375.00	345.00	720.00	135.00	195.0	195.0	195.0	0.00	0.00	585.00
17	Sanitation and Solid Waste Management Plan	1500.00	1200.00	2700.00	1620.00	360.0	360.0	360.0	0.00	0.00	1080.00
18	Local Area Management Plan	450.00	3950.00	4400.00	4010.00	130.0	130.0	130.0	0.00	0.00	390.00
19	Environmental Safeguards i/c Road Construction	194.00	320.00	514.00	49.00	155.0	155.0	155.0	0.00	0.00	465.00
20	Energy Conservation Measures	500.00	400.00	900.00	272.25	209.25	209.25	209.25	0.00	0.00	627.75
21	Environmental Monitoring Plan	177.00	228.00	405.00	0.00	135.0	135.0	135.0	0.00	0.00	405.00
Total		**346780.66**	**251407**	**598187.66**	**574436.71**	**7799.65**	**7809.65**	**7805.65**	**169**	**167**	**23750.95**

CHAPTER 11SUMMARY AND CONCLUSION

11.1 BACKGROUND

Telangana State, situated in the southern part of India, is the 29th state of India, formed on 2nd June 2014 with 1,12,077 Sq. km. of area and has a population of over 35 million. Analysis of last 30 years data on drought in Telangana State indicates the state has experienced 23 years as droughts affected in some or other mandals. Further, non-availability of sufficient irrigation facilities and limitations w.r.t. ground water exploration makes Telangana State drought prone. The agricultural statistics for 2015-16 indicate that Nalgonda, Mahabubnagar, Rangareddy and Medak districts are susceptible to droughts in Telangana. Being a new state, the government is making every effort for optimal use of available water resources for agriculture, industrial sector as well as providing drinking water for overall development.

11.2 NEED FOR THE PROJECT

The newly re-organized districts Mahabubnagar, Nagarkurnoll, Rangareddy, Vikarabad and Nalgonda of Telangana State are the one of the drought prone and distressed areas in country. Further, there is significant shortage of drinking water; as a result, a large part of the population of these districts is being forced to migrate to other parts of the country. The situation is further compounded due presence of fluoride in water. The Net irrigated area of net cropped area in Mahabbubnagar, Nagarkurnool, Nalgonda, Rangareddy and Vikarabad districts is only 23.8%, 13.2%, 24.4%, 24.2% and 18.1% respectively. In order to redress this situation, the Government of Telangana has taken up the Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) for alleviating the misery of these drought prone areas.

11.3 LOCATION AND APPROACH

The command area (Ayacut) is located between Longitude $77^0$21'51"E to $78^0$54'23"E and latitude$16^0$26'54"N to$17^0$38'09"N. Venkatadri reservoir at village Vattem, Bijinapally Mandal, District Mahabubnagar is the first reservoir from which the water lifted from Srisailam reservoir shall be harnessed for irrigation. The main canal network is approachable by road from the nearest towns. The nearest railway station is “Jadcherla” at a distance of 23 km. The nearest airport is Hyderabad at a distance of 93 km. Mahabubnagar is the District Head quarter, Jadcherla, Kalwakurthi, Narayanpet, Bhutpur, Devarakadra, Kodangal, Shadnagar in Mahabubnagar District & Gandeed, Tandur, Dharur, Chevella, Vikarabad and Pargi are the major towns located in the project area. The Secunderabad - Bangalore Railway line of S C Railway and Hyderabad - Bangalore NH-44 and SH-4 & SH-21 pass through the mid region of the project area and provide easy accessibility to canals and distribution system.

11.4 PROJECT FEATURES

The works under Phase-I, primarily involves construction of series of approach channels, open canals (50.490 km), tunnels (61.577 km), pump houses (5) and reservoirs (6-with total live storage 65.245TMC) for conveying water to various stages of lift and storing it for consumptive

use in drinking water, industrial uses and irrigation. In Phase –II, the project activities shall involve construction of 13 main canals (Total length 915 km) and distribution network to serve an ayacut of 4,97,976 ha with area under Kharif and Rabi irrigation shall be 4,95,835 ha (99.57%) and 77,887 ha (15.64%) respectively. The annual intensity has been assessed as 112.50 % of the CCA. The canals shall be lined and canal capacity has been fixed on the basis of peak requirement that includes 10% extra for rush irrigation. The total net crop water requirement at farmers field for the proposed Cropping pattern 50.99 TMC (1,443.73 MCM) consisting of 40.15 TMC during Kharif season and 10.83 TMC during Rabi season. The total cost of the project is Rs. 55,086.57 crores. The B.C. Ratio has been assessed as 1.26:1.

11.5 ENVIRONMENT IMPACT ASSESSMENT

M/s. Voyants Solutions Pvt. Ltd, Gurugram, Haryana, has conducted the Environment Impact study, as per ToR issued by the MoEFCC, New Delhi, vide letter no. J-12011/31//2017-IA-I (R), dated 11.10.2017.

11.6 EXISTING STATUS OF ENVIRONMENT

11.6.1 Land Use/Land Cover

The dominating land use classes are agricultural land Kharif cropped area accounted for maximum 3,39,562 ha (38.41% of the gross command area) followed by agricultural land double cropped area and agricultural fallow lands and agriculture land Rabi/summer cropped with 2,16,735 ha (24.52%) 1,47,959 ha (16.74%) and 33,728 ha (3.82%) respectively.

11.6.2 Total Land Requirement for Construction of The Project

The total land requirement for entire project shall be 28273 ha comprised of 12483 ha and 15790 ha for Phase-I &Phase-II respectively. The apportionment between Government, Patta and forest land requirement under Phase-I shall be 2768.86 ha, 9508.60 ha and 205.54 ha respectively whereas for Phase-II it shall be 2698 ha, 13092ha and nil ha respectively

11.6.3 Archaeological / Historical Monuments/Sensitive Area

The nearest distance of the Phase-I project component is 11.95km from Amarabad WLS and 2.56km from buffer area of Amarabad Tiger reserve (Rc.No.6531/2016/FCA-1/TS, dt; 20.12.2016). However, no National Park, WLS, Défense Establishments, Archaeological Monuments, Notified Eco-sensitive areas or protected area under Wild Life (Protection) Act exists within 10 km distance from the command area under Phase-II.

11.6.4 Soil Quality

The results of the soil analysis show that the soil is neutral to slightly basic at all the locations having pH varying from 7.20 to 7.65. The texture of the soil varies from sandy clay loam to clay. Available nitrogen content in the surface soils ranges between 133.5 to 185.2 kg/ha thereby is indicating that soils are low in available nitrogen content. Available phosphorus content ranges

between 12.1 to 15.9 kg/ha) thereby indicating that soils are medium in available phosphorus. Available potassium content in the soils ranges between 167.3 to 204kg/ha, thereby indicating medium to high in potassium content. The organic carbon varies from 0.49 % to 0.73% thereby implying that soils have low to medium organic carbon.

11.6.5 Air and Noise Environment

At all monitoring location the minimum and maximum PM_{10} concentration ranged between 18.3 - 49.3 µg/m^3 with 98 percentile values as 48.9 µg/m^3, while $PM_{2.5}$ concentration ranged between 9.9 - 26.9 µg/m^3 with 98 percentile values as 26.5 µg/m^3. Whereas, SO_2 & NO_X concentrations ranged between 4.0 - 7.4 µg/m^3 with 98 percentile values as 7.3µg/$m^3$and 7.5 - 18.3 µg/m^3 with 98 percentile values as 18.0 µg/m^3 respectively. The noise monitoring shows that day and night time noise levels are within the prescribed limits.

11.6.6 Water Environment

The pH values of analysed surface water samples ranged between 7.62 – 8.45 and are within the acceptable limit (6.5-8.5). The TDS levels ranged from 149 to248 mg/l and were less than the desirable limit of 500 mg/l. Total hardness levels ranged from 50 to 130 mg/l and were well below the acceptable limit of 200 mg/l. The dissolved oxygen values ranged between 2.5-9.7 mg/l and in respect of six samples for all season it was less than 4mg/l, i.e., the limit under CPCB Water Quality Criteria for designated best use (C), while in Samples from Srisailam reservoir (SW-7 &SW-8), it was more than 6mg/l.

The chlorides level in surface water samples ranged from 20 -50 mg/l and were below the acceptable limit of 250 mg/l. The sulphates level ranged from 18.5 to 37 mg/l and were below the acceptable limit of 200 mg/l. The nitrate level ranged from 2.6 to 4.2 mg/l and were below the acceptable limit of 45 mg/l. The BOD values ranged between <3.0 to 9mg/l and in six samples (SW-1 ro SW-6) for all season exceeded the CPCB criteria of less than 3mg/l or less for Class C water, whereas it was less than 3mg/l for two samples taken from Srisailam reservoir (SW-7&SW-8). The Total Coliform level were less than 5000 MPN/100ml, the limits specified for Class C water under CPCB Water Quality Criteria for designated best use. The water is suitable for meeting drinking water requirements after conventional treatment and disinfection. The water to be lifted from Srisailam reservoir is also suitable for irrigation purpose as it conforms to the CPCB Criteria for best designated use for Irrigation (Class -E water) in so far as (i) pH values are between 6.0 to 8.5; (ii) EC is less than 2250 µS/cm: (iii) SAR varies between0.58-0.89 i.e., less than 26 and Boron is less than 2mg/l. The ground water had all parameters within the desirable limits.

11.6.7 Status of Biological Environment

a) Flora of the Project Area

- During the surveys, an inventory of different plant groups found in the study area was prepared. In the study area 57 species of plants were recorded. These include 32 trees, 12 shrubs, 13 species of herbs and 6 species of grasses.
- About 14 economically important plant species were recorded from the study area.

- About 17 important medicinal/ethnobotanical importance plant species were recorded

b) Fauna

The faunal study for the proposed project was carried out in both the submergence and influence zone of both upstream and downstream

- 19 mammalian species were recorded /reported during the survey of which two belongs to Schedule-1 of WPA, 1972.
- 51 bird species were observed /reported during the survey of which 1 belong to Schedule-1.
- As many as 6 species of herpetofauna were recorded /reported.
- 16 species of fishes were recorded.

11.6.8 Social and Cultural Background of The Area

a) Demography of Mandals covered under Ayacut

There are 7,71,354 households with a total population of 35,61,580 in Mandals covering the ayacut. The male and female population in all mandals under ayacut is 17,98,712 and 17,62,869 respectively with overall sex ratio of 980 females per 1000 male. The total population of Scheduled Cast and Scheduled Tribe in mandals of Ayacut is 6,67,434 (18.7%) and 3,75,372(10.5%) respectively. The literacy rate is 56.20%. The percentage of Main workers and marginal workers in the mandals of ayacut is 43.07% and 7.82% respectively, while non-workers constitute 49.11%.

b) District-wise Land to be Acquired and PAF

Under Phase-I the requirement of (Patta land) has been estimated as 12277.46 ha of which about 10524.38 ha has already been acquired at different times. Due to project 5139 families shall be displaced due to submergence for phase -I works The total Patta land and Govt. land required for the main canal and for distribution system shall be 13,092 ha and 2,698 ha respectively. No residential structure, shop and cattle shed shall be acquired (**Table 11.1**).

Table 11.1: District Wise Land to be Acquired for Canal Network

S.N.	District	PAF	Private (Patta land) to be acquired (ha)		Total Private land (ha)	Govt. Land (ha)	Total Land (ha)
			Main Canal	Branches Distributaries and Minors			
1	Mahabubnagar	3027	1681	1750	3431	339	3770
2	Narayanpet	1019	566	485	1051	104	1155
3	Nagarkurnool	1195	870	560	1430	124	1554
4	Nalgonda	185	0	200	200	10	210
5	Rangareddy	3670	1877	1802	3679	395	4074
6	Vikarabad	5795	1201	2100	3301	1726	5027
Total		**14,891**	**6,195**	**6,897**	**13,092**	**2698**	**15790**

11.7 IDENTIFICATION, PREDICTION AND EVALUATION OF IMPACTS

11.7.1 Impacts on The Micro-Climate of The Area

Due to construction activities, there shall be temporary and nominal effect on the ambient temperature and humidity. The operation stage project may not create any impact on the meteorology and climatology of the area.

11.7.2 Change In Land Use / Land Cover

a) Construction Phase

The land use class of 205.54 ha forest land diverted for Phase-I shall change into waterbody as well as built up area. The land use class of Patta land coming under submergence in reservoir shall change into waterbody. The land use of Patta land used in construction of open canal, tunnels and approach canals shall change into waterbody as well as built up area. The land use class agriculture land (private land) and barren land (revenue) involved in canal section shall change into waterbody and built-up area. The change shall be permanent and irreversible

b) Operational Phase

During the operation phase no change in land use is expected. Many of the redundant areas having no further usage will be brought under plantation.

11.7.3 Soil Erosion and Siltation

a) Construction Phase

Soil erosion due to excavation of different components of the project, construction of roads will accelerate soil erosion.

b) Operational Phase

Soil erosion due to project activities will not exist in the operation phase as the construction would be completed and landscape restoration work would also be implemented

11.7.4 Impact on Geology

The intensity of anticipated environmental impact on geology of the area will be weak and extent of anticipated impact will be local. No impact is anticipated on the geology of the area during the operation phase.

11.7.5 Impact on Hydrology

The project envisions lifting of 90TMC @1.5 TMC in about 60 days during the flood season from the fore shore of the Srisailam Reservoir project on Krishna River at village Yellur in Kollapur mandal of Nagarkurnool district. Therefore, the most obvious impact hydraulic impact shall be alteration of the downstream flow regime during the period the water from the reservoir shall be lifted for storing in reservoirs for drinking /industrial and irrigation purpose. The daily

abstraction of water shall be about 680 cumecs during period of abstraction. The most common attribute of water abstraction shall be a decrease in the magnitude of flood peaks downstream of the dam.

Ground water recharge from implementation and operation of PRLIS system shall be due to rainfall, seepage from reservoir; losses from canal system and field application (return flow). The total recharge due to project shall be 1291.02 MCM (45.59 TMC) in the CCA of 4,97,976 ha. After accounting for unavoidable natural discharge (10%), the net ground water recharge shall be 1,161.92 MCM (41.03 TMC) as shown in **Table 11.2.**

Table 11.2: Ground water Recharge

Form of Groundwater Recharge	Recharge (MCM)			Recharge (TMC ft.)		
	Mon	Non-mon	Total	Mon	Non-mon	Total
Command Area						
Recharge from Rainfall	254.00	75.23	329.22	8.97	2.66	11.63
From canal seepage	139.84	74.58	214.42	4.94	2.63	7.57
From seepage of reservoirs	7.58	16.84	24.42	0.27	0.59	0.86
From return flow of Irrigation – SW	346.59	69.96	416.54	12.24	2.47	14.71
Total Future Recharge –Command	**748.00**	**236.60**	**984.60**	**26.42**	**8.36**	**34.77**
Non-Command Area						
Recharge from Rainfall	149.51	49.46	198.97	5.28	1.75	7.03
From return flow of Irrigation –GW	70.63	36.82	107.45	2.49	1.30	3.79
Total Future Recharge -Non-command	**220.13**	**86.28**	**306.42**	**7.77**	**3.05**	**10.82**
Total Future Recharge –Total	**968.13**	**322.88**	**1291.02**	**34.19**	**11.40**	**45.59**
Unavoidable natural discharges (10%)	96.81	32.29	129.10	3.42	1.14	4.56
Net groundwater availability – Future	**871.32**	**290.60**	**1,161.92**	**30.77**	**10.26**	**41.03**

The rise in water table shall be minimum for Nalgonda district (0.03m/yr) and maximum for Mahabubnagar district (0.65m/yr). Therefore, necessary water management strategies, such as conjunctive use of surface and groundwater are necessary in these areas.

11.7.6 Environmental Degradation Due to Labour Immigration

During the construction phase congregation of approximately 13500 workers is likely to take place in the project area, which will increase pressure on land and water resource. Conflict between the migrants and the local population may occur for employment. Labour engaged in construction activity will also move away once the project work is completed; therefore, no additional impact is expected.

11.7.7 Impacts on Air Environment

Temporary changes in air quality during construction phase are expected due to emission of hydrocarbons from vehicles and gases from blasting operations. The air quality modelling reveals that maximum resultant concentration for PM_{10}, $PM_{2.5}$, NOx and SO_2 are 60.04 µg/m^3, 27.73 µg/m^3, 23.48 µg/m^3 and 7.97 µg/m^3respectively and are within NAAQS. Due to increased transportation during construction phase at 25 m, predicted concentration for PM10 is 12.4 µg/m3, which reduces to 7.7 µg/m3, 3.4 µg/m3 and 1.4 µg/m3 at 50m, 150m and 500m

respectively. Thus, the impact on the pollutant level (PM10) due to increased traffic due to transportation of mineral shall be minimal. The increased GLC in respect of NOx were insignificant being 0.13 µg/m3 up to 25m and 0.11 µg/m3 up to 50m and 0.10 µg/m3 up to 1km.

11.7.8 Impacts on Noise Environment

Temporary increase in noise levels is expected during construction phase only. The estimated noise level at head reach of Venkatadri Main Canal shall be 70 dB(A), whereas at three receptors at dhania Koduparthy Mitta, Bajipur Pedha Thanda and Vattem due to running of construction machinery, shall be 39 dB(A),34dB (A and 40dB(A) and the resultant noise levels including the background level at these receptors, shall be 49 dB(A),46 dB (A and 47dB(A) which are less than the standard values. Thus, there will be increase in noise levels ranging from 7dB(A) to 12dB (A), but yet the resultant noise levels shall be within limits during day time but at night time it will exceed the limit.

11.7.9 Impacts Due to Ground Vibration and Air -Overpressure Due to Blasting

Due to blasting, the resulting PPV shall be between 1.71 mm/sec to 3.68mm/s which shall be considerably lower than the limiting values 5.0 mm/sec for excitation frequency less than 8 Hz, in case of temporary structures. Predicted air over pressure due to blasting at Badua and Karapura shall range between 103.2-109.8dB(A) respectively and is lower than 120 dB(A).

11.7.10 Impacts on Water Environment

During the construction phase, the water environment of the waterbody due to proposed project shall be impaired due to increase in silt rate from the discharge coming out open air works, batching and crushing plants and from the foundation works. The leakage of POL and washings of workshop floors and washing of vehicle and equipment bring oil and grease with it and shall increase the concentration of oil and grease in water, if discharged into the river section. The impact shall be felt during construction with the slight increase in turbidity in the river/ water bodies despite resorting to de-siltation of silt laden discharge coming from various excavation points, but the transparency of the water shall not be impaired to the extent that the available sunlight ceases to power the photosynthetic reactions. Apart from ground water recharge from the application of water in command area, the quality of ground water will also improve in the entire area as the quality of surface water to be applied conforms to class “E” water as per CPCB Water Quality Criteria based on best designated use.

In operation phase due to running of canals and application of water in fields in such area where water table is high, waterlogging and soil salinity development can occur due to heavy losses of water due to seepage from canals, distributaries and water courses

11.7.11 Impacts on Flora

Forest land and non-forest land shall be brought under submergence along with trees. This shall lead to loss of some of the plant species used for various economic purposes. Interestingly the vegetation composition of the project zone is also widely distributed in the influence zone in

abundance and there will be no significant loss to the habitat. However, any loss of vegetation during the project activity period will be restored in due course of time. The floral abundance of the project area in post construction phase will increase by many folds as the plantation under green belt, restoration and landscaping will be completed.

11.7.12 Impacts on Fauna

As the project activity is not going to affect all the major habitats, there is little concern for these niche birds. There will be no alteration to the existing habitat of endangered and threatened species. Increase in temporary stress levels of wildlife during construction phase due to noise, human interference and reduction in present habitat. Threat due to poaching might increase. Due to reservoir creation, there will be improvement in the habitat for mainly water birds, reptiles, mammals, amphibians and plankton and Improvement in food chain of some reptiles, birds and carnivorous mammals due to creation of reservoir and increase in humidity level.

11.7.13 Summary of Positive and Negative Impacts

a) The positive impacts

- Irrigation potential shall be created in area (4,97,976ha)
- Better living Standards for famers of command area.
- Employment opportunities/to locals in project work and fisheries.
- Benefits to economy and commerce.
- Access to improved infrastructure facilities.
- Recreation and tourism potential may boost
- Improvement in environment through implementation of different plans.
- Command Area Development.
- Better opportunities for cattle rearing.
- Increase in groundwater level

b) The negative impacts

- Due to project 14,891 families shall be affected due to land acquisition for phase -II works
- Due to project 5139 families shall be displaced due to submergence for phase -I works
- The loss of agriculture land (22600ha) and agriculture produce.
- Disturbance to the fauna of the study area during construction
- Pressure on the existing provincial / state road will increase.

11.7.14 Impact Management

To ameliorate the negative effects of the project construction and overall improvement of the environment following management plans are formulated for implementation concurrent to the project construction. The cost of the management plans is shown in **Table 11.3.**

Table 11.3: Summary of Total Cost Estimate of EMP

S.N.	Plans	Phase-I	Phase-II	Total Cost	Capital cost	Annual Recurring					
						I-Yr	II-Yr	III-Yr	IV-Yr	V-Yr	Total
1	Catchment Area Treatment Plan	248.66	00.00	248.66	248.66	0.0	0.0	0.0	0.00	0.00	0.00
2	Command Area Development Plan	00.00	74985.00	74985.00	57945.00	5680	5680	5680	0.00	0.00	17040.00
3	Compensatory Afforestation Scheme	5856.00	00.00	5856.00	5856.00	0.0	0.0	0.0	0.00	0.00	0.00
4	Wildlife and Bio-diversity Management plan	161.00	539.00	700.00	430.00	54.0	54.0	54.0	54.0	54.0	270.00
5	Fisheries Management Plan	1752.00	100.00	1852.00	1813.00	13.0	13.0	13.0	0.00	0.00	39.00
6	Resettlement & Rehabilitation Plan	331592.00	156624.00	488216.00	488216.00	0.0	0.0	0.0	0.00	0.00	0.00
7	Green Belt Development Plan	81.00	2964.00	3045.00	2490.00	111.0	120.0	116.0	105.0	103.0	555.00
8	Reservoir Rim Treatment Plan	270.00	00.00	270.00	215.00	11.0	12.0	12.0	10.0	10.0	55.00
9	Muck Management Plan	2380.00	7125.00	9505.00	9064.00	147.0	147	147	0.00	0.00	441.00
10	Landscape and Restoration Plan	39.00	76.00	115.00	64.00	17.0	17.0	17.0	0.00	0.00	51.00
11	Restoration Plan for Quarry Sites	62.00	76.00	138.00	54.00	28.0	28.0	28.0	0.00	0.00	84.00
12.	Disaster Management Plans	55.00	35.00	90.00	84.00	2.0	2.0	2.0	0.00	0.00	6.00
13	Water, Air and Noise Management Plan	678.00	640.00	1318.00	358.00	320.0	320.0	320.00	0.00	0.00	960.00
14	Ground Water Management	170.00	1200.00	1370.00	1370.00	0.0	0.0	0.0	0.00	0.00	0.00
`15	Public Health Delivery Plan	240.00	600.00	840.00	142.80	232.4	232.4	232.4	0.00	0.00	697.20
16	Labour Management Plan	375.00	345.00	720.00	135.00	195.0	195.0	195.0	0.00	0.00	585.00
17	Sanitation and Solid Waste Management Plan	1500.00	1200.00	2700.00	1620.00	360.0	360.0	360.0	0.00	0.00	1080.00
18	Local Area Management Plan	450.00	3950.00	4400.00	4010.00	130.0	130.0	130.0	0.00	0.00	390.00
19	Environmental Safeguards i/c Road Construction	194.00	320.00	514.00	49.00	155.0	155.0	155.0	0.00	0.00	465.00
20	Energy Conservation Measures	500.00	400.00	900.00	272.25	209.25	209.25	209.25	0.00	0.00	627.75
21	Environmental Monitoring Plan	177.00	228.00	405.00	0.00	135.0	135.0	135.0	0.00	0.00	405.00
	Total	**346780.66**	**251407**	**598187.66**	**574436.71**	**7799.65**	**7809.65**	**7805.65**	**169**	**167**	**23750.95**

CHAPTER 12 DISCLOSURE OF CONSULTANTS ENGAGED

12.1 BRIEF PROFILE OF COMPANY

Voyants Solutions Private Limited (VSPL) is one of India's fastest growing, premier infrastructure consultancy services firms with global footprint. Voyants provides end-to-end, integrated infrastructure solutions across all major sectors viz. transportation, roads, bridges, railways, ports, residential townships, commercial complexes, industrial parks, SEZs, urban infrastructure, smart cities, energy, water & sanitation and waste management.

Voyants provides concept to commissioning services throughout the project life cycle. It takes on every element of infrastructure project ranging from project initiation and feasibility, planning, environment and sustainability management, privatization and project advisory, detailed design, tendering, project management and construction supervision, commissioning and finally to operation and maintenance.

Voyants is an ISO 9001: 2015 certified firm and NABET accredited EIA consultant in nine sectors. Voyants is registered with a number of international & national funding agencies and empanelled with more than 100 government agencies globally. Our clients include Fortune 500 companies, blue-chip corporations, multilateral funding institutions, prestigious government agencies and key lending institutions.

Capitalizing on our experience for more than a decade, we have been managing nearly all aspects of environmental planning and sustainability, from regulatory compliance to green buildings. Our key focus is on environmental compliance management, solid and hazardous waste management, environmental impact Assessment with Management Plan, Environmental Site Assessment (ESA) Phase I & II, Environment, Water and Energy Auditing, Environmental and Social Due Diligence study, ISO & OHSAS advisory services, environmental monitoring, Social Impact Assessments including R&R and RAP studies, Source Water Venerability and Source Water Protection Plans Water Optimization Assessments and Biodiversity Assessment Studies. We have delivered more than 450+ projects that have successfully cleared all stringent environmental prerequisites. We strongly believe that by shifting the energy burden from non-renewable to renewable resources, we can stand up to the challenges of the future. VSPL is accredited as "Category "A" Organization under QCI NABET Version 3 for 12 Sectors".

12.2 TEAM OF PROFESSIONAL

Voyants has team of highly talented and experienced professionals including all required NABET approved Environmental Coordinators and Functional Area experts who work in sync with each other & clients ensuring that the defined assessment, survey or reporting is executed with high level of efficiency. Our experts team consists of Environment engineers, Environment specialist, Policy analysts, geologists, chemists, Safety Experts, civil engineers, hydro geologists, Bio-diversity experts, industrial hygienists, technicians, research associates, sociologists and others with expertise in various niche areas. They undergo various training sessions at regular intervals to keep themselves updated with new ideas, techniques and tools.

Table 12.1: Qualification and Area of Expertise of Professional

Name	Qualification	Project Role	Experience/Responsibility
Yamesh Sharma	B.Sc. Civil Engineering	EIA-Coordinator River Valley & Irrigation Projects, Mining Projects. FAE HG, SC & NV.	More than 46-year comprehensive experience in designing, planning, construction and maintenance of hydraulic structures (Dam, dam site and Canals), besides in following areas: - • Environment Impact Assessment • Hydrology & Hydro-Geology • Ground Water Estimation • Water optimization & conservation • Land Use and Cover Study • Noise modelling & Vibration • Air quality modeling and prediction. • Soil Conservation & Quality Analysis • Rainwater Harvesting & Storm Water Management • Catchment Area Treatment • Dam Break Analysis • Command Area Development
Santoshkumar Kulkarni	M. Sc. Environmental Sciences	Project Director FAE- WP, AP and AQ	Overall responsibility to deliver the project to VSPL standards and client expectations following the applicable guidelines. As a FAE he does the following works • Interpretation and assessment of ambient air quality data and meteorological data for cumulative impact assessment. • Identification & assessment of quantum of emissions. • Study of the requirement of suitable air pollution control devices • Air Modelling using ISCST 3 • Impacts identified and mitigation measures suggested in the EMP.
Radhakrishna Moorthy Periasamy	M Phil (Geology / Hydrogeology) M. Sc. Geology	FAE Geology and Land Use	He has more than 47 years of technical working experience, out of which he worked more than 33 years with State Ground and Surface Water Resources Data Centre (WRO) PWD, Chennai as Deputy Director (Geology), worked mainly for 1. Remote sensing Studies and land-use,

Name	Qualification	Project Role	Experience/Responsibility
			2. River basin Studies. 3. Groundwater exploration in Tamil Nadu State Since 2005 (more than 14 years), he is working as FAE for Geology and Land Use doing the following works • Assessment of baseline geology and land use • Impact prediction w.r.t. Geology & Land use of the study area
Mr. Dhritiman Dutta	Masters in Economics	FAE SE	Mr. Dutta is a social expert with over 22 years of experience Shall be responsible for carrying out socio economic survey and preparation of R&R plan if applicable. The study shall follow the ADB Safeguard policies. Review of land acquisition and R&R shall be an integral responsibility.
Dr. Rekha Singh	PhD (Environmental Sciences) M. Sc. Environmental Sciences PGD in Industrial Safety Management	FAE- RH, WP and SHW	Dr. Rekha is an environment professional with over 19 years of experience in the areas of Environment Impact Assessment Study, Risk Assessment Study and Preparation of Disaster Management Plan of open cast Mining, Building and Large Construction, Township Development, Oil Pipeline, Oil and Gas Storage Facility, Petroleum Refinery, Fertilizer Units, Industrial Estate and Municipal Solid Waste Management Facilities in India and Middle East. She is well versed with MoEF&CC guidelines.
Dr. Ashish Rawat	PhD (Forest Ecology and Environment) M. Sc. Environmental Sciences	FAE- EB	With more than 14 years of comprehensive experience, Dr. Ashish Rawat has carried out EIA, ESIA and ESHIA studies for more than 70 development projects in different domains viz., Road and Highways, Wind and Solar Energy, Oil and Gas, Waste Management for the Multilateral Funding Agencies including, the World bank, JICA, ADB, African Development Bank, NHAI and Saudi Aramco (Saudi Arabian Oil Company) in India, Nepal, Yemen, Saudi Arabia, Qatar and Bahrain
Debasmita Biswal	B. Tech Mechanical Engineering and Specialization in	FAE- Land Use	More than 15-year experience in the following areas: - • Land Use & Land Cover • Mapping (Remote Sensing &GIS

Name	Qualification	Project Role	Experience/Responsibility
	Photogrammetry		Software) • Change in Land Use /Land cover • Photogrammetry
Mr. Kamal Singh	MA in Public Administration	FAE- SE	Mr. Kamal is a social expert with over 14 years of experience Shall be responsible for carrying out socio economic survey and preparation of R&R plan if applicable.
Support Staff			
Ms. Sony Gangwar	M.Sc. Biotechnology	Environmental Executive (FAA-WP)	Primary data generation, field visit in-line with agreed scope of work
Ms. Nitti Goyal	M. Tech Environmental Sciences	Environmental Executive	Primary data generation, field visit in-line with agreed scope of work
Mr. Arup Barman	BA	Social Executive	Primary data generation, field visit in-line with agreed scope of work including Stakeholder questionnaire survey and FGD
Mr. Saransh Gupta	M.Tech. Health Safety & Environment Engineering	Environment Executive	Comment updating and support sector expert to compile the report

12.3 VISON LABS

VISON LABS is accredited by NABL as per ISO/IEC 17025:2005, recognized by Ministry of Environment, Forest & Climate Change (MoEFCC), Government of India and certified by ISO 9001: 2008 OHSAS 18001:2007.

VISON LABS has specialized experience in facilities in determining quality horizons of water and waste water, materials, chemicals, food products, Ambient Air Quality Monitoring (AAQM) Stack Monitoring, and in turnkey projects of Sewage treatment Plants, Effluent Treatment Plants and in R.O. Plants (operation and maintenance). The NABL Accreditation certificate of Vison Lab along with MoEF&CC Letter is enclosed as **Annexure III**.

CHAPTER 13 ECOLOGICAL DAMAGE ASSESSMENT, REMIDIATION PLAN, NATURAL AND COMMUNITY RESOURCE AUGUMENTATION PLAN

13.1 INTRODUCTION

The chapter involves assessment of ecological damage, preparation of remediation plan and natural & community resource augmentation plan. This applies to works under Phase-I of PRLIS Project, which were started without obtaining prior environmental clearance under the Environment Impact Assessment Notification, 2006.

13.2 OBSERVATION & RECOMMENDATION OF THE EAC IN ITS 34TH MEETING

The EAC, River Valley & Hydro Projects, while apprising the PRLIS Project for EC, in its 34th meeting held on 14th September, 2022, observed that the project involves violation of the provisions of the EIA Notification, 2006 and project will be appraised as per the SoP issued vide OM dated 7.07.2021 for consideration of Violation cases under EIA Notification, 2006, as amended. It also desired that the assessment of cost of damage should be as per SoP after the project proponent submits the following information:

(i) The project proponent shall be required to submit a bank guarantee equivalent to the amount of remediation plan and natural and community resource augmentation plan with the SPCB prior to the grant of EC. The quantum shall be recommended by the EAC and finalized by the regulatory authority. The bank guarantee shall be released after successful implementation of the EMP, followed by recommendations of the EAC and approval of the regulatory authority.

(ii) Assessment of ecological damage with respect to air, water, land and other environmental attributes shall be carried out by the accredited consultant of the PP. The collection and analysis of data shall be done by an environmental laboratory duly notified under the Environment (Protection) Act, 1986, or an environmental laboratory accredited by NABL, or a laboratory of a Council of Scientific and Industrial Research (CSIR) institution working in the field of environment.

(iii) The PP has to obtain clearance from inter-state aspect from the designated authorities as per procedure.

(iv) Preparation of EMP comprising remediation plan and natural and community resource augmentation plan corresponding to the ecological damage assessed and economic benefits derived due to violation to be done.

(v) The remediation plan and the natural and community resource augmentation plan to be prepared as an independent chapter in the EIA report by the accredited consultants.

(vi) Socio Economic Study following standard procedures to be included, impacts due to project activities need to be assessed and remedial measures to be proposed based on the Field Study and issues raised during Public Hearing.

(vii) As the area is on fluoride affected zone, therefore, provisions should be made to recharge the groundwater through proposed reservoirs to dilute fluoride levels.

13.3 OBSERVATION & RECOMMENDATION OF THE EAC IN ITS 40TH MEETING

In furtherance of the directions of the Hon'ble NGT in the matter of OA No. 212 along with OA No. 148 of 2021 regarding alleged illegal and unauthorized construction of Palamuru Rangareddy Lift Irrigation Scheme (PR LIS) & Dindi Lift Irrigation Scheme (Dindi LIS) – reg, the EAC deliberated on the main issue regarding changing the project from drinking water project to irrigation scheme and several other environmental violations that have been committed. In compliance of the direction given by the Hon'ble NGT regarding the constitution of an Oversight Committee for guiding and supervising remediation activities in the project site, the EAC nominated a six members committee and recommended the Ministry to constitute the said Committee.

13.4 STATUS OF WORK EXECUTED WITHOUT OBTAINING PRIOR EC

The work under Phase-I of the Project related to construction of series of approach channels, open canals, tunnels, pump houses and reservoirs for conducting water to various stages of lift from Lift-I up to Lift stage -IV, commenced from July 2016 and continued till end of November, 2021. Approximately 46% work has been completed in this period. The work on Lift-V including construction of K. P Lakshmidevipally reservoir, is yet to be taken up. Based on the information provided by the Project Proponent, the date of commencement of work and the date on which work were halted under different packages of work along with percentage of work executed is provided in **Table 13.1.**

Table 13.1: Package wise Details of Work Executed and Violation Period

Package Number	Work Description Under Package	Work commencement date	Date of halt of work	Total working days	% of work Completed
1	Construction of Stage-1 Pumping Station	06-07-2016	22-11-2021	1596	42.37
2	Formation of Anjanagiri reservoir, Narlapur(V), Kollapur(M)	10-08-2016	31-10-2021	1551	89.44
3	Approach channel, Open canal including construction of CM & CD works and Head Regulator from Anjanagiri Reservoir at Narlapur (V) i.e., from Km 0.00 to Km 8.325 towards Veeranjaneya Reservoir at Yedula (V)	24-06-2016	01-11-2021	1341	72.30
4	Construction of Twin tunnel in between Narlapur Reservoir at Narlapur (v) and Yedula Reservoir at Yedula (v)	26-07-2016	22-11-2021	1904	66.62
5	Construction of Stage-2 Pumping station near Veeranjaneya Reservoir	21-07-2016	31-10-2021	1947	47.12
6	Earth work Exacavation of Approch channel, Open canal including construction of CM&CD Works and Head regulator from Veeranjaneya Reservoir at Yedula Village i.e., from km 0.00 to km 6.40 to Venakadri Reservoir,	13-07-2016	11-11-2021	1632	90.66
7	Construction of Tunnel from Km.6.400 to Km.25.400 between Veeranjaneya Reservoir at Yedula (V) to Venkatadri Reservoir at Vattem (V)	06-10-2016	21-11-2021	1797	55.05
8	Construction Of Stage -3 Pumping Station at Vattem	19-09-2016	17-11-2021	1873	48.00
9	Formation of Venkatadri Reservoir bund from Km 0.00 to Km Km.6.900/6.770 at Vattem(V), Bijinepally(M), Mahabubnagar District.	03-10-2016	18-11-2021	1365	80.00
10	Formation of Venkatadri Reservoir Bund from Km 6.770 to 10.750 at Vattem (V)	29-07-2017	16-11-2021	960	71.00
11	Formation of Venkatadri Reservoir Bund from Km 10.750/11.550 to Km 15.230/16.300	30-10-2016	20-11-2021	1540	63.35
12	Earth Work Excavation of Canal from Venkatadri Reservoir to Kurumutharya Reservoir & Construction of CM & CD works.	19-05-2016	13-11-2021	1728	74.00
13	Formation of Kurumurthyraya Reservoir Bund from Km.0.000 to Km.4.500 at Karvena (V) Boothpur (M) Mahabubnagar (Dist) of Palamuru Rangareddy Lift Irrigation Scheme.	18-10-2016	31-10-2021	1479	69.87
14	Formation of Kurumuthyraya Reservoir bund from Km. 4.500 to Km. 7.600 at Karivena (V), Boothpur (M), Mahabubnagar Dist.	18-10-2016	31-10-2021	1444	58.33
15	Formation of Kurumuthyraya Reservoir bund from Km. 7.600 to Km. 14.400 at Karivena (V), Boothpur (M), Mahabubnagar Dist.	18-10-2016	31-10-2021	1504	84.32
16	Construction of Stage-IV Pumping Station near Udandapur village of Jadcherla Mandal in Mahabubnagar District.	09-04-2016	31-10-2021	1911	36.00
17	Formation of Udandapur Reservoir from Km 0.000 to Km 6.300 at Udandapur (V), Jadcherla (M), Mahabubnagar District	03-10-2019	31-10-2021	778	58.23
18	Formation of Udandapur Reservoir from Km 6.300 to Km 15.875 at Udandapur (V), Jadcherla (M), Mahabubnagar District	06-07-2018	31-10-2021	1092	48.38

13.5 COLLECTION OF BASELINE DATA

The EAC in its 34th meeting held on 14th September, 2022, had desired the project proponent to submit the assessment of ecological damage with respect to air, water, land and other environmental attributes for which collection and analysis of data shall be done. Therefore, monitoring of ambient air quality, surface and ground water quality, soil quality as well as noise levels measurements were conducted at such locations like pumphouses and reservoir formation, where the quantum of construction works was substantial and in concentrated area.

13.5.1 Air Quality Assessment

Monitoring was carried out during post-monsoon 2022 for Particulate Matter (PM10& PM2.5), Sulphur Dioxide (SO2), and Oxides of Nitrogen (NOx) as these are the main pollutants which are released during soil excavation, dozing, drilling, blasting, loading and unloading and from wind erosion and transportation of excavated material besides construction material. Sampling was carried out on 24-hourly, twice a week. The ambient air quality levels were assessed with respect to National Ambient Air Quality Standards prescribed by Central Pollution Control board (CPCB) 2009. Summary results of ambient air quality monitoring data are shown in **Table 13.2.** The air quality monitoring locations are shown in **Figure13.1**.

Table 13.2: Summary of Ambient Air Quality Data (µg/m3) During Post-Monsoon, 2022

St. Code	PM_{10}			$PM_{2.5}$			SO_2			NO_2		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
AAQ-1	45.2	54.6	50.4	13.8	17.2	15.3	5.3	6.9	5.8	9.6	15.2	11.6
AAQ-2	44.2	56.3	51.0	16.1	22.1	19.8	5.8	7.3	6.3	9.5	15.4	12.0
AAQ-3	45.8	53.2	49.7	16.2	21.2	19.6	5.5	6.9	6.1	9.6	13.7	11.7
AAQ-4	47.5	56.2	52.6	15.2	21.8	18.4	5.4	6.9	6.2	9.0	14.8	11.5
AAQ-5	48.2	56.3	52.0	16.1	22.4	19.6	5.5	7.2	6.4	8.6	14.1	10.9
AAQ-6	48.5	57.4	53.2	17.2	23.1	21.0	5.5	7.4	6.6	8.2	13.7	10.7
AAQ-7	49.6	56.9	52.4	17.4	23.8	20.0	5.8	7.9	6.5	8.9	15.6	11.2
AAQ-8	49.4	57.2	53.7	19.4	24.2	22.0	5.7	7.6	6.6	9.4	14.6	11.8
24 hr NAAQS	**100**			**60**			**80**			**80**		

AAQ-1: Pumphouse Stage-1; AAQ-2: Narlapur((Anjanagiri Reservoir); AAQ-3: Potireddypally (Venkatadari Reservoir); AAQ-4: Vattem(Stage-III pumping station); AAQ-5: Bandamidapally(Stage-IVpumping station & Kurumaurthy Reservoir) ; AAQ-6: Kuchoor (Udandapur Reservoir); AAQ-7: Teegalapally(Stage-II Pumphouse) and AAQ-8: Yedula(Veeranjanaya Reservoir)

The monitoring results reveals that at all sampling location the minimum and maximum PM10 concentration ranged between 44.2 – 57.4 µg/m^3 with mean value as 51.9 µg/m^3; while PM2.5 concentration ranged between 13.8 – 24.2 µg/m^3 with mean value as 19.5 µg/m^3. Whereas, SO2 concentrations ranged between 5.3 - 7.9 µg/m^3 with mean values as 6.3 µg/m^3 and & NO2 concentration ranged between 8.2 – 15.6 µg/m^3 with mean value as 11.4 µg/m^3 respectively. Overall, it's observed that the concentration of all the pollutants were within the NAAQS limits set forth by CPCB

and as per CPCB Criteria for air quality index, air quality at all locations is good to fair as the maximum of average 24-hour air quality index has been 54, which is below 100.

The project proponent had also carried out monitoring for air quality at each of these stations during 2019,2020 and 2021 by engaging an NABL accredited Laboratory (TEAM Labs and Consultants, Hyderabad). The mean values for the air pollutants are brought out in **Table13.3**

Table 13.3: Summary of Ambient Air Quality Data (µg/m3) During 2019,2020 &2021

Pollutants	AAQ-1	AAQ-2	AAQ-3	AAQ-4	AAQ-5	AAQ-6
Year-2019						
PM10	47	45	39	38	41	42
PM2.5	15	14	13	14	12	13
SO2	9	8	7	8	7	8
NOx	14	12	11	13	10	12
Year-2020						
PM10	45	42	37	36	37	39
PM2.5	14	13	11	12	13	11
SO2	8	7	6	7	8	6
NOx	12	11	10	11	12	11
Year-2021						
PM10	44	41	38	36	37	39
PM2.5	13	14	15	12	11	14
SO2	8	9	6	8	7	9
NOx	13	11	10	12	10	13

AAQ-1: Pumphouse Stage-1; AAQ-2: Narlapur; AAQ-3: Potireddypally ; AAQ-4: Vattem; AAQ-5: Bandamidapally and AAQ-6: Kuchoor

During the period when construction activities were going on, it's observed that the concentration of all the pollutants was within the NAAQS limits set forth by CPCB. A comparison of the pollutant concentration observed during 2022 and values observed during period 2019-2021 shows that the concentration at present is higher, which is attributed to the fact that during construction period mitigation measures like dust suppression was being carried. Nevertheless, the pollutant concentration is within limits and is not an issue of concern.

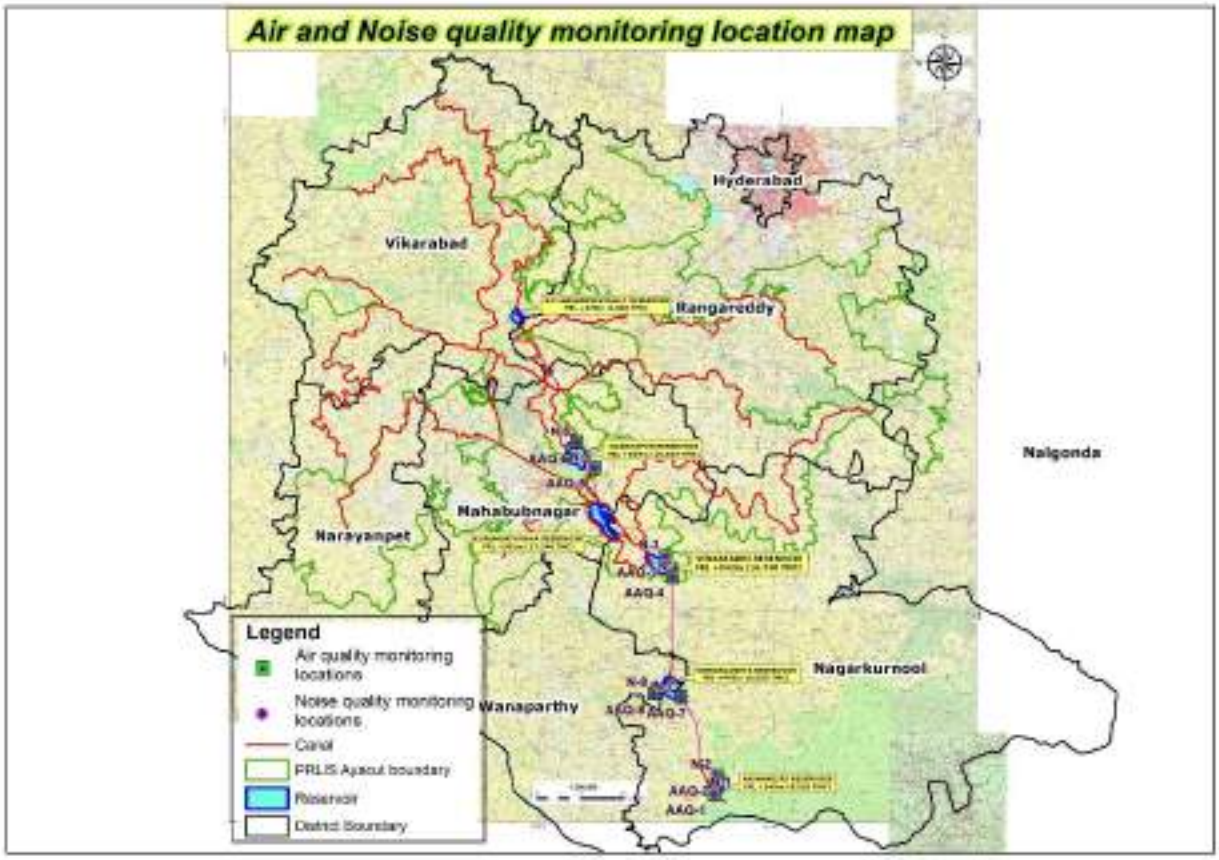


Figure 13.1: Air Quality & Noise Levels Monitoring Locations

13.5.2 Noise Level Assessment

Noise monitoring was conducted at eight such locations like pumphouses and reservoir formation, where the quantum of construction works was substantial and where maximum construction equipment were deployed in concentrated area. Accordingly, one full day (i.e., 24-hourly values) of data was collected at each of the locations for post-monsoon season. Summary results of monitored data are shown in **Table 13.4.** The noise level monitoring locations are shown in **Figure13.1.**

Table 13.4: Summary of Leq D and Leq N Noise Levels in dB(A) During Post-Monsoon, 2022

Station Code	Post-monsoon 2022		CPCB Limits Leq. dB(A)	
	Leq D	Leq N	Day	Night
N1	46.9	36.2	55	45
N2	52.1	40.8	55	45
N3	52.2	42.2	55	45
N4	52.6	40.7	55	45
N5	49.9	38.5	55	45
N6	49.7	38.7	55	45
N7	51.6	42.4	55	45
N8	52.8	42.6	55	45

N-1: Pumphouse Stage-1; N-2: Narlapur; N-3: Potireddypally; N-4: Vattem; N-5: Bandamidapally N-6: Kuchoor; N-7: Teegalapally and N-8: Yedula.

The noise monitoring results **(Table13.4)** show the day and night time noise level at all locations were within the prescribed limit. With the discontinuing of construction work of PLRIS under 18 packages, the movement and operation of noise generating construction equipment and heavy earthmovers have come to a halt and the major source of the noise in such area now is routine vehicular movement as well as rural activity.

It may be noted that during construction the physical impact on noise environment had been in the form of increase in noise levels at project site and settlement which are very close to construction site. But the impact was temporary in nature, reversible, direct and for short period. Blasting generates instantaneous and impulsive noise for short duration.

For a combination of excavator and dozer for excavation and FE loader and dump truck for transportation and considering that excavator, dozer and dumper work 80 %,70% and 40% on- time in that time period respectively the Leq sound pressure shall be 87 dB(A). Considering the source height of 1.0 m, barrier height of 2m at a distance of 10m from source for multiple spectra the resulting sound pressure level at receptor at higher level for different distances is given in **Table13.5.** It is clear from table that the sound pressure levels are drastically reduced with increase in distance from source

Table 13.5: Sound Pressure Levels in dB(A)

Distance from source (m)	SPL due to operation of excavation, loading operation and dump truck for transportation (without barrier)	SPL considering barrier
15	87.0	87.0
30	81.0	66.8
60	75.0	57.0
120	69.0	50.4
240	63.0	43.8
480	57.0	37.2
960	51.0	30.3

The resultant noise levels by adding SPL at 480m with the corresponding background level at the noise level monitoring location has been worked out and shown in **Table 13.6**. The resultant values at all locations are less than the standard values. Thus, there will be increase in noise levels ranging from 0.1dB(A) to 2.1dB (A) during day time and 1.2dB(A) to 3.8dB (A during night time, which is insignificant.

Table 13.6: Resultant Sound Pressure Levels in dB(A)

Station Code	L equivalent		SPL at 480m distance considering barrier	Resultant SPA at monitoring location		Increase in noise level	
	Day	Night		Day	Night	Day	Night
N1	46.9	36.2	37.2	47.3	39.7	0.4	3.5
N2	52.1	40.8	37.2	52.2	42.4	0.1	1.6
N3	52.2	42.2	37.2	52.3	43.4	0.1	1.2
N4	52.6	40.7	37.2	54.7	42.3	2.1	1.6
N5	49.9	38.5	37.2	50.1	40.9	0.2	3.7

N6	49.7	38.7	37.2	49.9	41.0	0.2	3.8
N7	51.6	42.4	37.2	51.8	43.5	0.2	1.1
N8	52.8	42.6	37.2	52.9	43.7	0.1	1.1

13.5.3 Soil Quality Assessment

For studying soil quality of the area with a view to ascertain the impacts due to construction activities on the nearby agriculture land, soil samples were collected from the depth of 5cm to 15cm and representative samples prepared by thoroughly mixing. The homogenized samples were analysed for physico-chemical characteristics and enumerated in **Table 13.7** and sampling locations shown in **Figure 13.2.**

Table 13.7: Physico-Chemical Characteristics of Soil During Post-Monsoon, 2022

S.N.	Parameter	Units	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8
1	Texture	-	Clay Loam	Loam	Loam	Clay Loam	Clay Loam	Clay Loam	Loam	Clay Loam
2	Sand	%	44.1	39.4	40.4	39.5	33.8	32.5	38.9	39.5
3	Silt	%	25.2	37.4	34.6	31.3	32.6	32.1	36.6	30.9
4	Clay	%	30.7	23.2	25.0	29.2	33.6	35.4	24.5	29.2
5	pH (10% Slurry)	-	7.32	7.44	7.45	7.48	7.54	7.56	7.44	7.53
6	El. Conductivity	µs/cm	256	298	295	286	312	324	294	3.5
7	Organic Matter	%	0.95	1.2	1.15	1.17	1.21	1.24	1.2	1.17
8	Bulk density	gm/cc	1.42	1.35	1.36	1.35	1.28	1.26	1.46	1.35
9	Porosity	% v/v	46.4	49.1	48.7	49.1	51.7	52.5	44.9	49.1
10	S.A. R	-	0.15	0.17	0.17	0.15	0.18	0.15	0.19	0.16
11	Calcium as Ca	mg/kg	1815	1835	1724	1870	1950	1835	1865	1910
12	Magnesium as Mg	mg/kg	274	258	245	276	234	342	272	296
13	Sodium as Na	mg/kg	25.3	29.4	28.8	26.7	32.1	26.3	32.3	28.3
14	Potassium as K	mg/kg	150	156	147	165	195	182	153	172
15	Phosphorus as P	mg/kg	8.8	7.6	9.7	9.5	9.45	9.8	8.4	9.2
16	Chloride as Cl	mg/kg	70.4	72.3	70.6	67.7	46.7	77.2	44.6	68.2
17	Zinc as Zn	mg/kg	1.27	1.86	1.25	1.30	1.45	1.21	1.94	1.66
18	Copper as Cu.	mg/kg	1.38	1.46	1.18	1.53	1.83	2.36	1.67	1.78
19	Iron as Fe	mg/kg	12.80	14.1	12.4	12.7	17.5	10.6	14.1	13.4
20	Nitrogen as N	mg/kg	124.3	107.6	89.4	101.7	126.3	173.2	97.8	100.2
21	Organic Carbon	%	0.52	0.65	0.62	0.63	0.65	0.67	0.65	0.63
22	Sulphate as SO4	mg/kg	86.1	103.5	81.4	84.2	73.2	80.1	102.9	84.2
23	Sulphur as S	mg/kg	18.3	15.6	22.2	16.7	15.4	16.2	16.4	16.6
24	Fluoride as F	mg/kg	2.6	3.21	2.78	3.14	2.57	3.40	3.48	3.27
25	Selenium as Se	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26	Manganese as Mn	mg/kg	7.51	10.72	9.46	9.48	12.6	12.9	10.4	9.7
27	Chromium as Cr	mg/kg	6.60	5.21	6.06	6.81	4.34	5.02	5.32	6.95
28	Nickel as Ni	mg/kg	9.6	11.75	10.7	10.3	9.10	9.30	10.4	10.9
29	CEC	meq/100g	12.85	12.80	12.16	13.20	13.34	13.61	13.1	13.6

S-1: Pumphouse Stage-1; S-2: Narlapur; S-3: Potireddypally; S-4: Vattem'S-5: Bandamidapally; S-6: Kuchoor; S-7: Teegalapally and NS-8: Yedula.

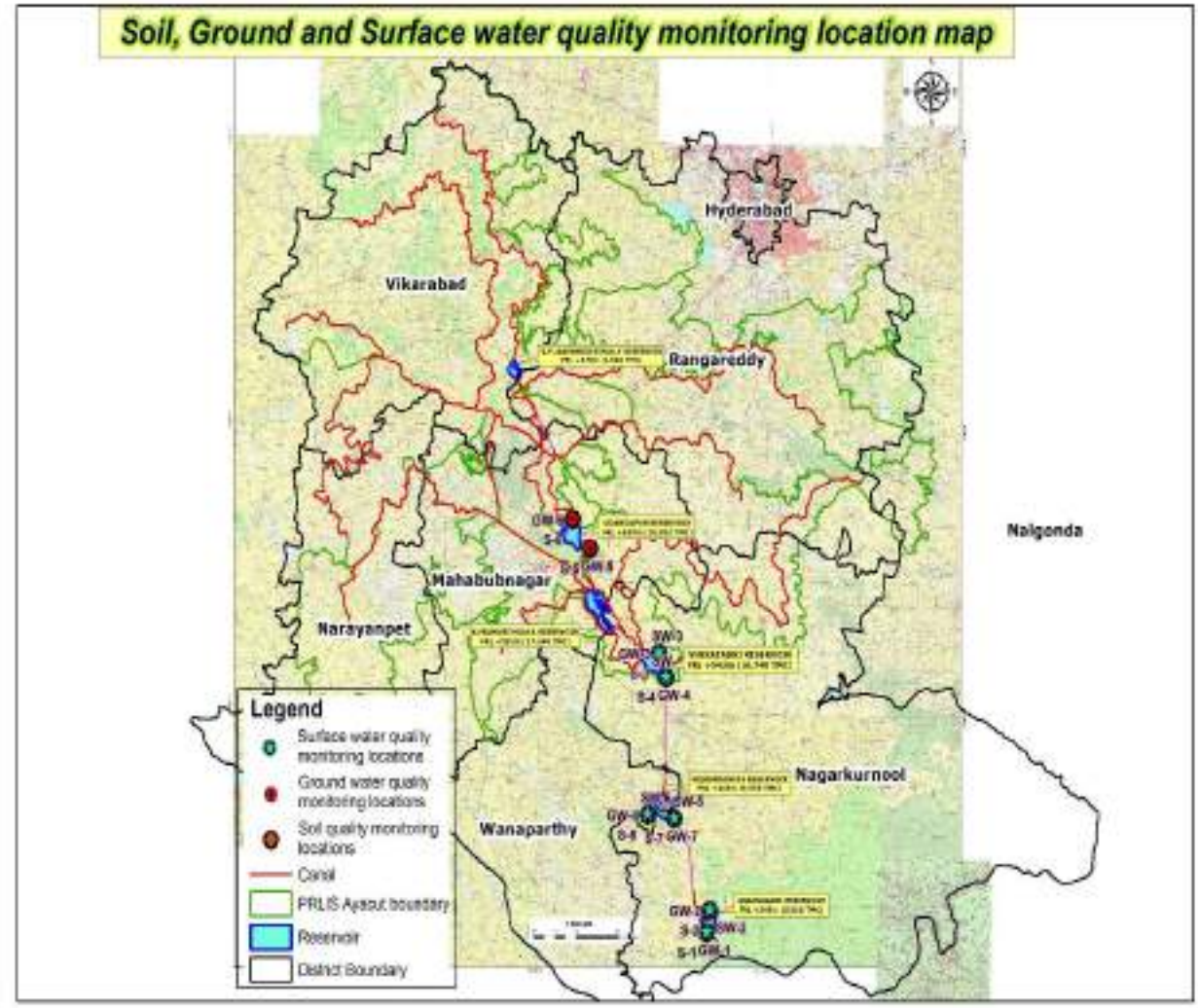


Figure 13.2: Soil & Water Quality Sampling Locations

The results of the soil analysis show that the soil is neutral to slightly basic at all the locations having pH varying from 7.32 to 7.56. The texture of the soil varies from loam to clay loam. Available nitrogen content in the surface soils ranges between 121.6 to 218.2 kg/ha thereby is indicating that soils are low in available nitrogen content. Available phosphorus content ranges between 10.3 to 13.2 kg/ha) thereby indicating that soils are medium in available phosphorus. Available potassium content in the soil ranges between 200 to 249.6kg/ha, thereby indicating medium to high in potassium content. The organic carbon varies from 0.65 % to 1.24% thereby implying that soils have medium to high organic carbon.

13.5.4 Water Quality Assessment

Water quality parameters of ground water and surface water resources, nearby the area where project construction under phase-1 was carried out, has been studied for assessing the water environment and evaluate anticipated impact of the construction activity.

13.5.4.1 Surface Water

Table 13.8 shows the physico-chemical characteristics of surface water samples collected during post-monsoon 2022. Water sampling locations are shown in **Figure 13.2**.

Table 13.8: Physico-Chemical Characteristics of Surface Water During Post-Monsoon, 2022

S.N.	Parameter	Units	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
1	pH at 25 °C	-	7.85	8.05	8.10	7.60	7.90	7.85
2	Color	Hazen	6	10	12	20	20	20
3	Turbidity (NTU)	NTU	2.1	2.4	2.7	3.2	6.2	4.30
4	EC	µS/cm	567	263	300	278	388	343
5	Total Dissolved solids	mg/l	380	176	201	186	250	230
6	Total Hardness as $CaCO_3$	mg/l	108	107	124	115	142	119
7	Total Alkalinity	mg/l	176	51	61	57	92	94
8	Calcium as Ca	mg/l	28.7	23.1	28.9	22.6	33.6	31.8
9	Magnesium as Mg	mg/l	8.8	12.1	12.6	14.3	14.2	9.7
10	Sodium as Na	mg/l	13.3	10.6	10.3	10.3	18.6	19.5
11	Chloride as Cl	mg/l	32.6	30.8	39.8	35.9	41.3	28.2
12	Potassium	mg/l	1.6	1.5	2.4	1.7	<0.02	<0.02
13	Phenolic Compounds	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
14	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15	Sulphate as SO_4	mg/l	26.4	34.2	28.6	25.3	24.6	20.5
16	Fluorides as F^-	mg/l	0.26	0.17	0.22	0.19	0.24	0.19
17	Nitrates as NO_3	mg/l	4.1	3.9	3.9	5.2	5.3	6.4
18	Iron as Fe	mg/l	0.14	0.12	0.14	0.10	0.12	0.10
19	Zinc as Zn	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20	Lead as Pb	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21	Arsenic as orc	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Mercury as Hg	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
23	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24	Total Chromium	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
25	Copper as Cu	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26	Manganese as Mn	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27	Selenium as Se	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Cyanide as CN	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
29	Aluminium as Al	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
30	Boron as B	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
31	DO	mg/l	4.4	4.1	4.0	4.2	4.1	4.3
32	COD	mg/l	21	30	26	24	22	27
33	BOD	mg/l	2.1	2.8	2.3	2.5	3.0	2.9
34	Coliform	MPN/100ml	290	455	325	360	410	355
35	E. Coli	MPN/100ml	140	292	176	205	240	235

SW-1: Pumphouse Stage-1; SW-2: Narlapur; SW-3: Potireddypally; SW-4: Vattem; SW-5: Teegalapall and SW-6: Yedula

The pH values of all analyzed samples ranged between 7.60 – 8.10 and are within the acceptable limit (6.5-8.5). The TDS levels ranged from 176 to 380mg/l and were less than the desirable limit of 500 mg/l. Total hardness levels ranged from 107 to 142 mg/l and were well below the desirable limit of 200 mg/l. The dissolved oxygen values ranged between 4.0-4.4 mg/l and were more than 4mg/l, i.e., the limit under CPCB Water Quality Criteria for designated best use (C). The chlorides level in surface water samples ranged from 30.8 -41.3 mg/l and were below the desirable limit of 250 mg/l. The sulphates level

ranged from 25.3 to 34.2 mg/l and were below the desirable limit of 200 mg/l. The nitrate level in surface water samples ranged from 3.9 -6.4 mg/l and were below the acceptable limit of 45 mg/l. The fluoride level in surface water samples ranged from 0.17 -0.26 mg/l and were below the desirable limit of 1.0 mg/l. The BOD values ranged between 2.1 to 3.0 mg/l and within the CPCB criteria of 3mg/l or less for Class C water, thereby implying that the drinking water source is not suitable even after conventional treatment and disinfection. The Total Coliform level ranged between 290-455 MPN/100ml and were below 5000 MPN/100ml, the limits specified for Class C water under CPCB Water Quality Criteria for designated best use.

13.5.4.2 Ground Water

Table 13.9 shows the physico-chemical characteristics of ground water samples collected during post-monsoon 2022. The pH values of all analyzed samples ranged between 7.15 – 7.55 and are within the acceptable limit (6.5-8.5). The TDS levels ranged from 345 to 1100mg/l and were less than the permissible limit of 2000 mg/l. Total hardness levels ranged from 169 to 658 mg/l and at one location exceeded the permissible limit of 600 mg/l. The chlorides level in surface water samples ranged from 56.2 -272.4 mg/l and were below the permissible limit of 1000 mg/l. The sulphates level ranged from 36.3 to 242.3 mg/l and were below the permissible limit of 400 mg/l. The nitrate level in surface water samples ranged from 7.6 -12.6 mg/l and were below the acceptable limit of 45 mg/l. The fluoride level in ground water samples ranged from 0.58 -0.86 mg/l and were below the desirable limit of 1.0 mg/l. The heavy metals are below their acceptable limits.

Table 13.9: Physico-Chemical Characteristics of Ground Water During Post-Monsoon, 2022

S.N.	Parameter	Units	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7	GW-8
1	pH at 25 °C	-	7.15	7.55	7.32	7.25	7.29	7.36	7.32	7.25
2	Color	Hazen	<01	<01	<01	<01	<01	<01	<01	<01
3	Turbidity	NTU	1.4	1.6	0.9	1.0	1.3	1.4	0.9	1.0
4	TSS	mg/l	3	3	2	2	4	3	2	2
5	TDS	mg/l	1100	443	345	695	595	644	680	813
6	TH as $CaCO_3$	mg/l	658	174	169	416	317	377	409	453
7	Total Alkalinity	mg/l	220	135	125	279	270	215	184	238
8	Calcium as Ca	mg/l	121	39	34	106	54	97	84	96
9	Magnesium as Mg	mg/l	86.4	18.6	20.3	36.7	44.3	32.7	48.3	51.7
10	Chloride as Cl	mg/l	272.4	65.2	56.2	75.3	73.0	109.9	176.2	185.2
11	Sodium	mg/l	94.3	64.7	35.7	33.5	44.8	41.3	55.7	73.5
12	Potassium	mg/l	2.8	2.5	2.4	2.2	2.8	2.5	2.9	2.6
13	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
14	Sulphate as SO_4	mg/l	242.3	78.6	36.4	89.8	36.3	85.0	80.3	102.4
15	Fluorides as F^-	mg/l	0.58	0.75	0.84	0.73	0.65	0.86	0.81	0.79
16	Nitrates as NO_3	mg/l	11.2	8.7	7.6	10.2	9.2	12.6	9.4	10.8
17	Iron as Fe	mg/l	0.25	0.16	0.13	0.11	0.20	0.16	0.23	0.11
18	Zinc as Zn	mg/l	0.038	0.010	0.006	0.018	<0.001	<0.001	0.006	0.020
19	Lead as Pb	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20	Arsenic as orc	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21	Mercury as Hg	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
22	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Total Chromium	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
24	Copper as Cu	mg/l	0.016	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
25	Manganese as Mn	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26	Selenium as Se	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27	Cyanide as CN	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Aluminium as Al	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
29	Boron as B	mg/l	0.003	<0.001	<0.001	0.008	0.004	0.018	<0.001	0.008
30	Pesticide Residue	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
31	Coli form	MPN/250ml	ND	ND	ND	ND	ND	ND	ND	ND
32	E. Coli	MPN/250ml	ND	ND	ND	ND	ND	ND	ND	ND

13.6 FRAMEWORK FOR ENVIRONMENTAL DAMAGE COMPENSATION

Environmental damage in a simplified manner mainly connotes the adverse impacts, due to anthropogenic activities, afflicted on natural resources such as air, soil, surface water, groundwater, flora and fauna, ecosystem, biodiversity and the environmental/ecosystem services provided by these to ecosystem or to humans. In economic term it is a cost to be compensated by the polluter attributable for release of harmful pollutants. Under the 'polluter pays' principal postulated by the Apex Court, India, the polluter is unambiguously responsible for damages and thus responsible for restore environmental damage by compensating damages for direct and indirect damages caused to human, property, flora, fauna including ecosystem functions. Environmental damage compensation would require monetizing cumulative activities preliminary site investigation, detailed site assessment, restoration and also compensation for environmental and ecological losses arising from direct and indirect damages. The General Framework for imposing Environmental Damage Compensation have been prepared in pursuant to the directions of Hon'ble National Green Tribunal via order dated April 24, 2019 in O.A. 606/2018.

13.6.1 Direct Damage

The term applies to direct damage caused through direct interaction of polluting activities with any components of environ.

13.6.2 Indirect Damage

These relate to consequential impacts and manifest in many forms away from the source of pollution.

13.6.3 Applicability

In line with the General Framework for imposing Environmental Damage Compensation, the principle of strict liability shall be exercised on the polluter while implementing environment damage compensation. It should be levied without finding a fault such as exceedance of standards, negligence or ill intention.

13.6.4 Standard Procedure

Standard procedure shall be followed for estimation of damages due to anthropogenic polluting activities. It *inter alia* involves preliminary investigation by conducting field visits, visual site inspections, review of existing documents, maps and literature and delineating sources of contamination at site and process of release in the influence area. Besides these the collection of history/background information of the contaminated site through discussion with local people and other informed people, district administration, municipal and regulatory authorities, NGOS, etc. Apart from these Information of prevailing or commonly reported health issues in the area is of paramount importance.

13.6.5 Impact Assessment Pathway

For assessment of EDC, step-wise approach shall be adopted for activities such as preliminary assessment, identification of direct and indirect liabilities, detailed environmental and ecological

studies, assessment of damages, calculation of compensation for direct and indirect liabilities. Based on preliminary survey and sampling, a detailed sampling protocol aimed at assessing the contamination level of the site and to establish the baseline environmental status of the project area was prepared. The protocol included identification of criteria pollutant (parameters) for analysis, number of samples, etc. The flow model of impact assessment pathways is shown in **Figure13.3.**

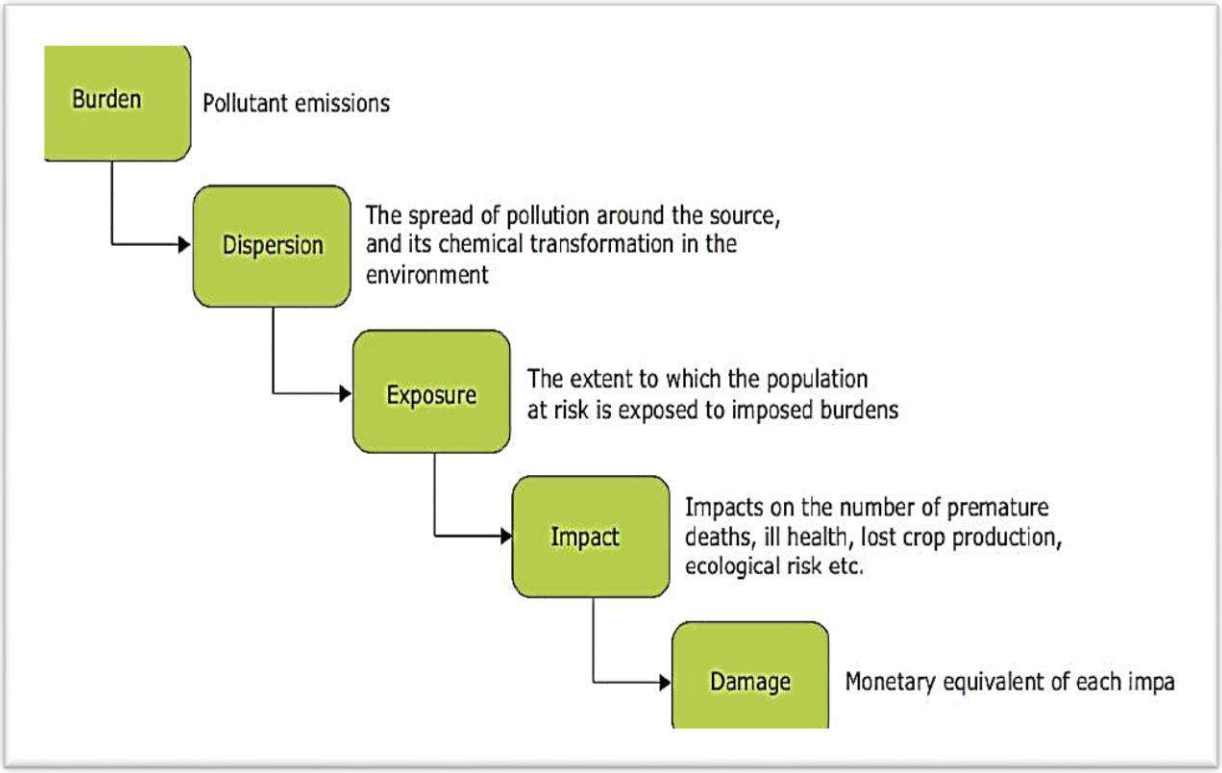


Figure 13.3: Impact Assessment Pathway

13.7 METHODOLOGY FOR ECONOMIC EVALUATION OF ENVIRONMENTAL DAMAGE

After having reviewed the available methodologies from CPCB and European Environmental Agency, and EU hand book-28, as well as based on brain storming and learnings from appraisal of a number of projects, a methodology which has wider application and encompasses all the sectors appraised under violation projects is proposed. Attribute wise details which formed the input for quantifying damage assessment equivalent to remediation cost, natural and community resources augmentation costs. Environmental damage compensation is cumulative of one or more factors relating to environmental degradation of air quality, water resources, soil, groundwater, adverse effect on human health, loss of eco-system services, including damages caused to property, natural assets and productive assets. Thus, EDC includes cost of assessments, cost of restoration and compensation for direct and indirect damages caused to human, property, flora, fauna including ecosystem functions etc., identified during detailed assessment study. Indicative methods of damage quantification and EDC estimation have been provided in Appendix IV of General Framework for Imposing Environmental Damage Compensation by CPCB, December,2022. The damage assessment methodology is exhibited in **Figure 13.4.**

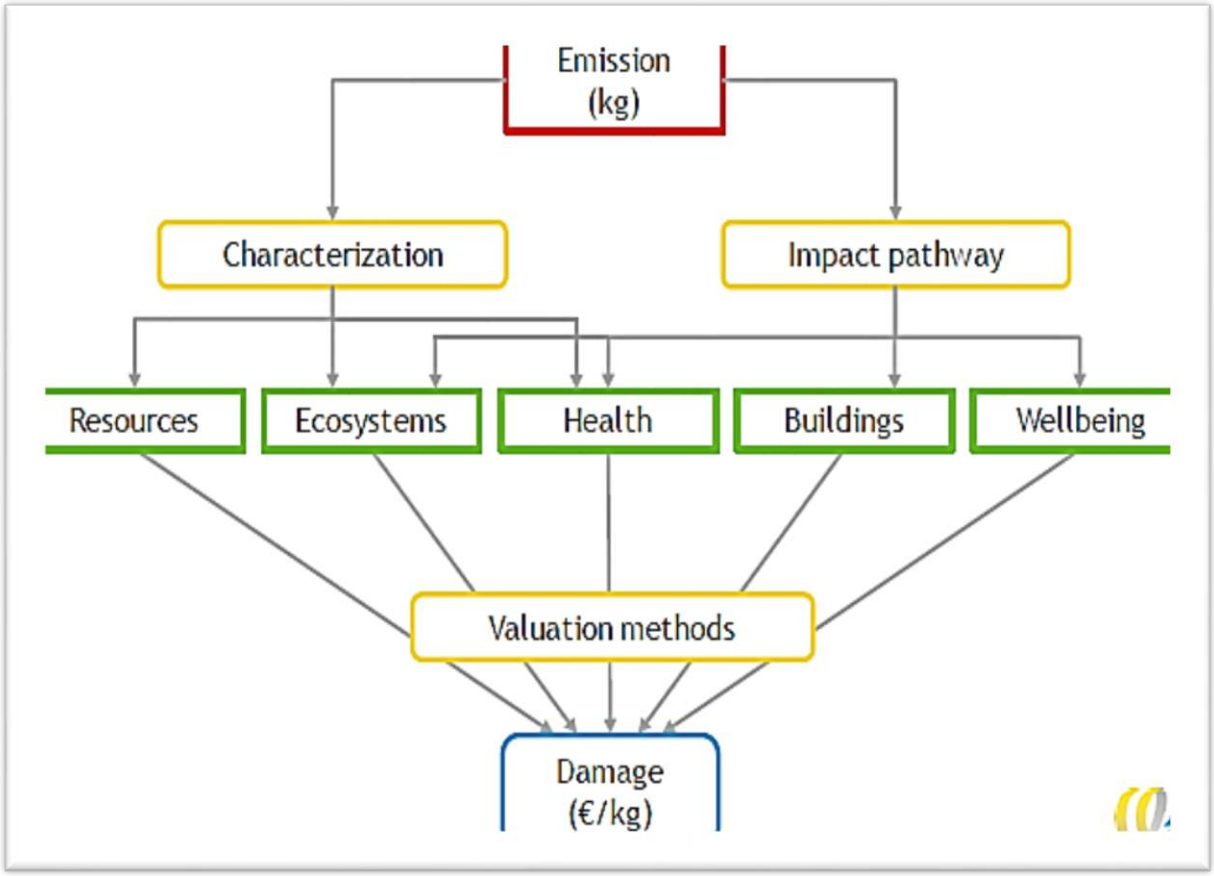


Figure 13.4: Damage Assessment Methodology

13.7.1 Inputs for Damage Assessment

Before embarking upon the assessment of damage to various environmental attributes during the period the work under PRLIS was executed without prior EC, such vital information was collected, which have bearing on the physical environs, construction related activities and physical quantum of work executed, use of natural resources, human resource, financial aspects, the timeframe of violation period.

13.7.2 Damage Assessment of Land Environment

The damage to land environment is mainly due to excavation necessitated for project components, approach roads and land development for project colonies/labour camps and disposal of muck. All these activities trigger land degradation in one way or the other. Excavation is invariably accompanied with clearance of vegetations form forest or non-forest land or both. To mitigate damage measures like proper slope stabilisation /restoration of land and scientific disposal of muck/excavated material has to be taken up concurrently with construction activities besides compensating the vegetal loss in non-forest land by way of green belt development. During construction period under violation proper muck disposal has neither been carried out nor work under green belt development has been taken *pari pasu* with the construction activity. The municipal solid waste generated from labour colony if not disposed in

designated landfill after segregation impair the land quality. Thus, damage assessment has to be reckoned under following counts.

13.7.2.1 Damage Assessment due to Improper Muck Disposal

The construction activities have several impacts on land environment like loss of agriculture and forest land, loss of productivity at nearby agriculture land, hindrance to natural surface runoff, soil degradation, etc. The primary cause for major impact to land comes from excavation works which results in muck generation. The muck which is evacuated should be disposed of and roller compacted or laid on mild slopes *pari-passu* with the excavation work, to such designated areas. If not, then the muck piles will substantially interfere with either environment/ ecology or the river flow regime and cause turbidity impairing the quality of water. Package wise details of quantity of excavation in both earthwork in all soils, disintegrated and soft rock not involving drilling and blasting, hard rock excavation with drilling and blasting, quantity of muck utilised in project work and the area affected due to muck disposal along with the perimeter of muck dump pile is elucidated in **Table13.10**.

Table 13.10: Status of Muck Generation, Utilization and Disposal

Package Number	Earthwork in all soils, HDR &F&E (cum)	Hard rock excavation (cum)	Total earth excavated (Col.2+Col .3)	Quantity of muck utilized (cum)	Quantity of muck un-utilized (cum) (Col.4-Col 5)	Area available for muck disposal (ha)	Area affected due to muck disposal (ha)	Perimeter of dumps (m)
1	2	3	4	5	6	8	9	
1	0	4785747	4785747	264663	4521084	42.51	6.6	1356
2	300000	1700000	2000000	400000	1600000	83		
3	100000	8500000	8600000	139424	8460576	121.86	32	7321
4	0	6328000	6328000	722000	5606000	111.34	89.6	4034
5	0	4737436	4737436	979424	3758012	121.46	-	-
6	300000	8667331	8967331	734782	8232549	86.64	-	
7	0	7810900	7810900	444059	7366841	161.94	51.8	11465
8	0	4005058	4005058	1308382	2696676	115.38	-	-
9	300000	1374392	1674392	48720	1625672	47.37	-	-
10	200000	580295	780295	350000	430295	30.36	-	-
11	300000	2033982	2333982	1650584	683398	50.61	-	
12	200000	11600000	11800000	5500000	6300000	161.94	60.77	12852
13	400000	562104	962104	562104	400000	34.41	-	-
14	200000	816307	1016307	816307	200000	36.44	-	-
15	300000	1381997	1681997	1381997	300000	37.25	-	-
16	100000	7638819	7738819	404682	7334137	119.43	-	-
17	200000	698745	898745	359874	538871	141.7	-	-
18	400000	1644000	2044000	1180895	863105	0	-	-
Total	**3300000**	**74865113**	**78165113**	**17247897**	**60917216**	**1503.64**	**240.77**	**37028**

During construction period under violation proper muck disposal has not been carried out as neither the disposed muck has been laid in proper slope nor benching has been carried out. Garland drains have been provided. Besides this the nutrient rich top soil from o-horizon (up to 15cm depth) of the area for muck disposal or from excavated area has been separately stored for spreading over area where green belt shall be developed. All these non-commission of the activities associated with well-designed Muck Disposal Plan has resulted in cost saving to the polluter and has to be compensated by the polluter **(Table13.11).**

Table 13.11: Cost Compensation due to Improper Implementation of Muck Management

S.N.	Particulars	Quantity	Unit	Rate (Rs.)	Amount (Rs. Lakh)
1	Cost saved in fencing as per engineering standard	241	ha	20000	48.20
2	Cost saved in utilization of top/fertile soil including provision for plantation	361500	cum	100	361.50
3	Cost saved for non-Provision for toe drains / toe wall for prevention of surface runoff and siltation as per engineering standard	37028	RM	300	111.08
Total					**520.78**

13.7.2.2 Damage Assessment due to Incomplete Green Belt Development

In order to mitigate and minimize environmental impacts from air pollution, noise pollution, soil erosion etc. arising due to construction of project, greenbelt development around the project sites is a good measure. The details of greenbelt development are elaborately mentioned in EIA / EMP Section 10.6; however, the cost saved for greenbelt development is calculated by considering 33% of each package area, after excluding area under submergence, underground works and canal section area, should have been covered with plantation as per standard condition. Based on the actual percentage of work completed in each, package, the area is calculated accordingly. For monetary assessment the cost taken is Rs.200 per sapling. The polluter has already planted 45535 number of trees, therefore deduction of cost on pro-rata basis has been made from the total cost **(Table13.12).**

Table 13.12: Cost Compensation due to Incomplete Implementation of Green Belt

Package Number	Project area after excluding area under submergence, underground works and canal section	33% of area as per Col.2	% Work completed	Pro-rata area for GB Col 3x Col 4	Total trees@ 2500/ha	Cost @Rs240/ tree (Rs lakh)
1	**2**	**3**	**4**	**5**	**6**	**7**
1	42.51	14.17	42.37	6.00	15000	36
2	83.00	27.66	89.44	24.74	61850	148.44
3	121.86	40.62	72.30	29.37	73425	176.22
4	111.34	37.11	66.62	24.72	61800	148.32
5	121.46	40.48	47.12	19.07	47675	114.42
6	86.64	28.88	90.66	26.18	65450	157.08
7	161.94	53.97	55.05	29.71	74275	178.26
8	115.38	38.46	48.00	18.46	46150	110.76
9	47.37	15.79	80.00	12.63	31575	75.78
10	30.36	10.12	71.00	7.19	17975	43.14
11	50.61	16.87	63.35	10.69	26725	64.14
12	161.94	53.97	74.00	39.94	99850	239.64
13	34.41	11.47	69.87	8.01	20025	48.06
14	36.44	12.15	58.33	7.09	17725	42.54
15	37.25	12.42	84.32	10.47	26175	62.82
16	119.43	39.81	36.00	14.33	35825	85.98
17	141.70	47.23	58.23	25.18	62950	151.08

18			48.38			
Total	**1503.64**	**430.6**		**313.78**	**784450**	**1882.68**
Less cost of 45535 trees already planted						**109.28**
Grand Total						**1773.40**

13.7.2.3 Damage Assessment due to Improper Solid Waste Management

It is very essential that from the planning stage, solid waste disposal facilities should be conceptualized to maintain the health of the people and the environment Solid waste has generated from the labour colonies under different contract packages. The project authority, as principal waste generator, shall be responsible for the implementation of the provisions of Solid Wastes Management Rules, 2016, issued by MOEF vide S.O.1357 (E) dated 8th, April 2016, and for any infrastructure development for collection, storage, segregation, transportation, processing and disposal of municipal solid wastes. Proper facilities for collection segregation and conveyance of solid waste generated to the disposal site should have been provided during the construction phase to comply MSW 2016 Rules. Solid waste generated in small towns is about 0.1 kg (Class-III) as per survey was conducted by the Environment Protection Training Research Institute (EPTRI), Hyderabad. Damage has been caused to environment on account of incomplete compliance of MSW, Rules, as partial facilities have been set up for solid waste management.

As per Report of the CPCB In-house Committee on Methodology for Assessing Environmental Compensation and Action Plan to Utilize the Fund, the Committee has suggested that environmental compensation in these cases should be comprised of two components i.e.

1. Cost saved/benefits achieved by the concerned individual/authority by not having proper solid waste management system; and

2. Cost to the environment (environmental externality) due to untreated/partially treated waste because of insufficient capacity of waste/sewage management/treatment facility.

As per the principles of SWM Rules, 2016 and PWM Rules 2016, as amended on 12th August ,2021, the total cost of Municipal Solid Waste management in a city/town includes cost for door-to-door collection, cost of segregation at source, cost for transportation in segregated manner, cost for processing of MSW and disposal through facility like composting, bio methanation, recycling, co-processing in cement kilns etc.

Environmental damage is assessed for partial provision of facilities as mentioned above and damage is calculated as cost saved as per the CPCB guideline, the amount of cost saved for solid waste is detailed out as per **Table 13.13.**

Table 13.13: Cost Compensation due to Partial Management of Solid Waste

Package Number	Total manpower	Total No of working days	Total waste generated (Tons)	Cost @8000/ton (Rs lakh)	Externality cost @ Rs1000/day (Rs lakh)	Total Cost (Rs lakh)
1	780	1596	124.49	9.96	15.96	25.92
2	500	1551	77.55	6.20	15.51	21.71
3	250	1341	33.53	2.68	13.41	16.09
4	450	1904	85.68	6.85	19.04	25.89
5	450	1947	87.62	7.01	19.47	26.48

6	125	1632	20.40	1.63	16.32	17.95
7	400	1797	71.88	5.75	17.97	23.72
8	750	1873	140.48	11.24	18.73	29.97
9	290	1365	39.59	3.17	13.65	16.82
10	220	960	21.12	1.69	9.6	11.29
11	490	1540	75.46	6.04	15.4	21.44
12	150	1728	25.92	2.07	17.28	19.35
13	524	1479	77.50	6.20	14.79	20.99
14	368	1444	53.14	4.25	14.44	18.69
15	311	1504	46.77	3.74	15.04	18.78
16	600	1911	114.66	9.17	19.11	28.28
17	250	778	19.45	1.56	7.78	9.34
18	500	1092	54.60	4.37	10.92	15.29
Total	**7158**	**27442**	**1169.82**	**93.58**	**274.42**	**368.00**

13.7.3 Damage Assessment of Air Environment

The impact on air during the initial phase is due site preparation, excavation/ quarrying activities, vehicle movements on haul roads and unpaved roads, transport of muck and construction materials, operation of diesel run equipment's and DG sets. The details of specific breakdown activities are mentioned below.

- Heavy construction activities like topsoil removal, dozing, loading & unloading and internal transportation for displacement of muck.
- Excavation/Quarrying activities like Drilling & Blasting, Loading & Unloading of Aggregate & Waste, Internal Transport of waste and aggregate on unpaved / haul road.
- Transport of construction materials from source to site
- Wind erosion from waste dumps.

13.7.3.1 Inputs for Damage Assessment

For damage assessment it is essential to assimilate following information

- Quantity of excavation in project area/quarrying and construction materials utilized.
- Lead distance involved in transportation of material

Package wise details of construction materials utilized during the violation period along with details of Topsoil, muck / waste generation is represented in **Table13.14.**

Table 13.14: Details of Construction Material Consumed & Excavated Quantities

Package Number	Details of construction materials				Excavated materials	
	Cement (MT)	Steel (MT)	FA /Sand (cum)	CA (cum)	Soil (cum)	Muck (cum)
01	32869	47900	34974	78696	0	4785747
02	8341	0	507595	472716	300000	1700000
03	28000	26500	34000	69057	100000	8500000
04	458200	2200	486000	987000	0	6328000
05	193040	43851	368808	610616	0	4737436
06	17458	884	465205	93382	300000	8667331

07	114409	956	554544	929621	0	7810900
08	115817	40053	693997	495441	0	4005058
09	1459	0	299409	725706	250000	1374392
10	8724	1696	8636	697088	200000	580295
11	357	0	550	1156307	300000	2033982
12	26000	3300	30000	65000	200000	11600000
13	3243	0	439669	755388	400000	562104
14	635	0	460196	229960	200000	816307
15	3405	0	862471	613032	300000	1381997
16	293752	31873	330471	675630	100000	7638819
.17	4388	796	258866	53908	200000	698745
18	15371	351	1044550	346600	400000	1644000
Total	1325468	200360	6879941	9055148	3250000	74865113

It is evident from above table that during period under violation of prior EC, the project work under 18 packages has generated 748.65Lakh cum of muck, 32.5 Lakh cum of soil of all kind including HDR &F&E, 90.55 Lakh cum of coarse aggregate and 68.80 lakh cum of fine aggregate. For damage assessment the quantity of crushed aggregate extracted from these respective excavation area/quarries and within site area are considered, which had caused damage to various environmental attributes like air, water, land, ecology, etc during operation during the violation period. The details of materials and their respective lead distance are shown in **Table13.15.**

Table 13.15: Package wise Lead Distance of Excavated Material

Package Number	Quarry material	Location	Lead (KM)
1	M. Sand	Yellur	6
	Coarse Aggregates		
2	BC Soil	Koppunur (V)	30
	SC Soil	submergence	3
	SC Soil	Rampur (V)	14
	SC Soil	Pentlavelli (V)	18
	GW soil	Submrgence	3
	GW soil	PSK Canal Dump	12
	GW soil	Rampur(V)	14
	GW soil	Pentlavelli (V)	18
	SM Soil	Submergence	3
3	Earth & Aggregates	At site	7
4	M. Sand & Coarse Aggregates	Kothapeta , Sathapur, Jonnalaboguda & Pasupula.	12
5	Earth & Aggregates	At site	6
6	Earth & Aggregates	Konakalapally	7
7	Soil & Coarse Aggregates	Spoil Bank	14
8	M. Sand & Coarse Aggregates	Kummera Village Nagarkurnool (M&D)	6
9	M. Sand & Coarse Aggregates	submergence area	8
10	Embankment soil	Submergence area	8
	Black cotton soils		28
11	Casing Soils	At site	4

	BC Soils		28
12	Earth & Aggregates	Spoil Bank	8
13	Earth & Aggregates	Spoil Bank	8
14		Spoil Bank	9
15		Spoil Bank	9
16	Earth & Aggregates	Spoil Bank	6
17	Earth & Aggregates	Spoil Bank	7
18		Spoil Bank	7

The details of working days during violation period up to December 2021 or the earliest, manpower deployed and fuel consumed with the per day excavation /quarrying, which has measure bearing upon calculation of pollutant emission per day is provided in **Table13.16.**

Table 13.16: Package wise Lead Distance of Material Transportation, Fuel and Manpower Utilised

Package Number	Total working days	Fuel utilized (kg)	Total Manpower	Materials transport lead distance			Dumping lead distance	Quarrying activity inputs		
				Fine aggregate (km)	Coarse aggregate (km)	Steel & cement (km)	Total earth (km)	Total working day	Production (TPD)	Internal lead (km)
1	1596	47770000	707070	6	6	20	3.1	906.5	1147.93	3.1
2	1551	35538248	324000	18	2	20	3.1	648	1765.39	3.1
3	1341	9152610.5	47500	1	7	20	3.1	190	879.57	3.1
4	1904	25500000	320400	1	12	20	3.1	712	3354.69	3.1
5	1947	67269655	433800	6	6	20	1.55	964	1532.87	1.55
6	1632	15048038	44250	7	7	20	1.55	354	638.37	1.55
7	1797	22372857	266200	14	14	20	1.55	665.5	3380.44	1.55
8	1873	16460368	706875	6	6	20	1.55	942.5	1272.11	1.55
9	1365	37791000	143260	8	8	20	1.55	494	39878.63	1.55
10	960	15823600	88770	8	8	20	1.55	403.5	4180.80	1.55
11	1540	27200000	307965	4	4	20	1.55	628.5	4452.29	1.55
12	1728	7225000	30450	8	8	20	1.55	203	774.88	1.55
13	1479	18229100	200430	8	8	20	1.55	382.5	4779.19	1.55
14	1444	14824000	117944	9	9	20	1.55	320.5	1736.36	1.55
15	1504	22796150	149280	9	9	20	1.55	480	3090.71	1.55
16	1911	8925000	436200	6	6	20	1.55	727	2249.00	1.55
17	778	6601950	53250	7	7	20	1.55	213	612.48	1.55
18	1092	17340000	286750	7	7	20	1.55	573.5	1462.55	1.55

13.7.3.2 Damage Assessment due to Release of Emission into Air during Excavation/Quarrying

During violation period, the project activity has resulted into emission of air pollutants like PM_{10}, $PM_{2.5}$, NOx and SO_2. The emissions are resulted during excavation/quarrying operation due to drilling, blasting, loading and unloading, wind erosion from stock piles and internal transport of waste and aggregate on unpaved / haul road. The emissions have been calculated by using USEPA AP 42 Emission Factors and ARAI booklet on vehicular emissions. The total emission released into atmosphere for each of pollutants resulting from these activities has been worked out in Tons considering the working days for each

activity. The damage cost has been calculated based on the values as per the assessment of EEA updated up to 2020, and at the 20% of EEA rates adopted are:

- PM_{10} – Rs. 340.00 per kg /day
- $PM_{2.5}$ – Rs 524.00 per kg /day
- NOx – Rs. 96.00 per kg /day
- SO_2 – Rs. 160.00 per kg /day

The emissions for each pollutant per day and the total damage cost to air due to release of pollutants into the air atmosphere is assessed up to December 2021 or the earliest, which varies between the packages and corresponding emissions, is given in **Table13.17.**

13.7.3.3 Damage Assessment due to release of Emission into Air during Dozing (Heavy Construction)

During violation period, the project activity has resulted into emission of air pollutants like PM10, PM2.5 and SO2. The emissions are resulted during top soil removal, dozing operation of soil and muck, loading & unloading of muck and top soil, burning of fuel in running of heavy earthmovers. The emissions have been calculated by using USEPA AP 42 Emission Factors. The total emission released into atmosphere for each of pollutants resulting from these activities has been worked out in Tons considering 10 hours of dozing for each working day. The damage cost has been calculated based on the values as per the assessment of EEA updated up to 2020, and at the 20% of EEA rates adopted which have been mentioned in sub- section 13.7.3.2

The emissions for each pollutant per day and the total damage cost to air due to release of pollutants into the air atmosphere is assessed up to December 2021 or the earliest, which varies between the packages and corresponding emissions, is given in **Table13.18.**

13.7.3.4 Damage Assessment for release of Emission during Transportation of Construction Material

During violation period, the project activity has resulted into emission of air pollutants like PM_{10}, $PM_{2.5}$, NOx and SO_2. The emissions are resulted during transportation of top soil and muck, coarse and fine aggregate construction material like cement and steel. The emissions have been calculated by using USEPA AP 42 Emission Factors and ARAI booklet on vehicular emissions. The total emission released into atmosphere for each of pollutants resulting from these activities has been worked out in Tons considering the working days for each activity. The damage cost has been calculated based on the values as per the assessment of EEA updated up to 2020, and at the 20% of EEA rates adopted which have been mentioned in sub- section 13.7.3.2.

The emissions for each pollutant per day and the total damage cost to air due to release of pollutants into the air atmosphere is assessed up to December 2021 or the earliest, which varies between the packages and corresponding emissions, is given in **Table13.19.**

13.7.3.5 Assumption Considered

The following assumptions are considered while calculating air damage

- For heavy construction, transportation and excavation/quarrying activities 50% of working days is considered
- The excavation in project area is dumped in nearby area not more than 5 KM
- Dump height considered is 12 meters except for tunnels
- Manpower for quarrying calculated at 1 for every 8.0 tonnes (OMS)

13.7.3.6 Control Measures for Air Environment Taken During Violation Period

Following mitigation measures was adopted during mining activities to control air pollution load below the prescribed limits:

- Dust generated due to drilling, blasting, ripping, and vehicular movements will be suppressed by water spraying during and after the operations.
- Water sprinkling done on the haul road and other roads at regular intervals.
- To avoid the dust generation during the drilling operations, wet drilling method was practiced.
- Dust mask were provided to the workers.
- Proper regular maintenance of machineries was done.
- Speed of the vehicles kept within the prescribed limits and these were not overloaded.

Table 13.17: Emissions from Excavation/Quarrying Operation & Damage Cost

Package No.	CA (Tonnes)	Waste (Tonnes)	Working days	Emission due to drilling (Kg/day)		Emission due to blasting (Kg/day)		Loading & unloading (Kg/day)		CA Transport (Kg/day)				Wind erosion Kg/day		Total emission (tonnes)				Damage cost (Rs Lakh)				Total (Rs Lakh)
				PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10	NOX	SOX	PM 2.5	PM 10	$PM_{2.5}$	PM_{10}	NO_X	SO_2	$PM_{2.5}$	PM_{10}	NO_X	SO_2	
01	78696	53510	1596	98.25	442.11	282.25	1411.24	27.54	187.30	59.05	124.49	8083.74	0.75	2368.72	24279.37	2.84	26.44	8.08	0.00	14.86	89.91	7.76	0.00	112.53
02	1143974.41	776620.5	1551	1428.18	6426.82	3348.85	16744.26	400.39	2722.66	198.35	411.39	159723.90	0.19	0.00	0.00	5.38	26.31	159.72	0.00	28.17	89.44	153.33	0.00	270.94
03	167118.037	52020	1341	208.64	938.87	698.14	3490.72	58.49	397.74	589.83	1223.35	68804.25	0.56	0.00	0.00	1.56	6.05	68.80	0.00	8.15	20.57	66.05	0.00	94.77
04	2388540	743580	1904	2981.95	13418.76	6287.53	31437.65	835.99	5684.73	468.68	972.08	372594.35	0.44	4910.80	50335.67	15.48	101.85	372.59	0.00	81.14	346.29	357.69	0.00	785.12
05	1477690.72	564276.2	1947	1844.81	8301.63	4301.11	21505.55	517.19	3516.90	1293.53	2682.88	174096.19	1.22	0.00	0.00	7.96	36.01	174.10	0.00	41.69	122.42	167.13	0.00	331.25
06	225984.44	711763.7	1632	282.13	1269.58	924.37	4621.87	79.09	537.84	517.65	1073.65	60773.22	0.50	0.00	0.00	1.80	7.50	60.77	0.00	9.45	25.51	58.34	0.00	93.30
07	2249682.82	848452.3	1797	2808.59	12638.67	5924.44	29622.20	787.39	5354.25	445.80	924.63	354354.62	0.41	11483.55	117706.38	21.45	166.25	354.35	0.00	112.40	565.24	340.18	0.00	1,017.81
08	1198966.11	1061816	1873	1496.84	6735.76	3610.72	18053.60	419.64	2853.54	1104.49	2290.80	138988.90	0.97	0.00	0.00	6.63	29.93	138.99	0.00	34.75	101.77	133.43	0.00	269.96
09	1538497	458096	1365	1920.72	8643.24	4137.56	20687.81	538.47	3661.62	2620.80	5439.53	24795.23	0.00	0.00	0.00	9.22	38.43	24.80	0.00	48.30	130.67	23.80	0.00	202.77
10	1686952.96	13213.08	960	2106.06	9477.26	4151.23	20756.17	590.43	4014.95	0.00	0.00	0.00	0.00	0.00	0.00	6.85	34.25	0.00	0.00	35.88	116.44	0.00	0.00	152.33
11	2798264.39	840.888	1540	3493.46	15720.59	6839.99	34199.97	979.39	6659.87	0.00	0.00	0.00	0.00	0.00	0.00	11.31	56.58	0.00	0.00	59.28	192.37	0.00	0.00	251.65
12	157300	45900	1728	196.38	883.71	699.73	3498.66	55.06	374.37	763.30	1583.14	78107.59	0.73	510.94	5237.08	2.23	11.58	78.11	0.00	11.66	39.36	74.98	0.00	126.01
13	1828038.96	672693.6	1479	2282.20	10269.88	4826.39	24131.96	639.81	4350.73	4178.72	8666.97	412324.34	3.85	0.00	0.00	11.93	47.42	412.32	0.00	62.50	161.23	395.83	0.01	619.56
14	556503.2	704100.4	1444	694.76	3126.42	1854.93	9274.66	194.78	1324.48	0.00	0.00	0.00	0.00	0.00	0.00	2.74	13.73	0.00	0.00	14.38	46.67	0.00	0.00	61.05
15	1483539.41	1319581	1504	1852.11	8334.49	4097.60	20488.00	519.24	3530.82	0.00	0.00	0.00	0.00	0.00	0.00	6.47	32.35	0.00	0.00	33.90	110.00	0.00	0.00	143.90
16	1635023.63	505620.6	1911	2041.23	9185.53	4646.35	23231.75	572.26	3891.36	1877.09	3893.22	250707.37	1.76	0.00	0.00	9.14	40.20	250.71	0.00	47.88	136.69	240.68	0.00	425.25
17	130457.36	396065	778	162.87	732.91	513.58	2567.92	45.66	310.49	236.57	490.65	27796.20	0.23	0.00	0.00	0.96	4.10	27.80	0.00	5.02	13.95	26.68	0.00	45.65
18	838772	1598162	1092	1047.16	4712.20	2435.57	12177.84	293.57	1996.28	0.00	0.00	0.00	0.00	0.00	0.00	3.78	18.89	0.00	0.00	19.79	64.21	0.00	0.00	84.00
	21584001.45	10526310														0.00	0.00	0.00	0.00	669.19	2372.74	2045.90	0.02	5087.86
																								Rs 50.88 Crores

Table 13.18: Emissions from Dozing (Heavy Construction) & Damage Cost

Package No.	Construction days	Fuel (kg)	Dozer working hours	Total emission (KG)									Total emission (Tonnes)				Damage cost (Rs lakh)				Total (Rs)
				Topsoil	Muck	Total earth	Top soil removal 50% cum		Dozing		Loading & unloading-muck + top soil		Fuel								
				(Tonnes)			PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10	SOX	$PM_{2.5}$	PM_{10}	NO_X	SO_2	$PM_{2.5}$	PM_{10}	NO_X	SO_2	
01	1596	47770000	7980	0	4521084	4521084	0.00	0.00	1275.75	7836.74	88.79	497.14	2388.50	1.36	8.33	0.00	2.39	7,15,019.94	28,33,517.43	0.00	3,82,160.00	39,30,697.37
02	1551	35538248.4	7755	300000	1300000	1600000	87.00	693.00	1239.78	7615.78	32.73	183.15	1776.91	1.36	8.49	0.00	1.78	7,12,382.95	28,87,254.08	0.00	2,84,305.99	38,83,943.02
03	1341	9152610.45	6705	100000	8360576	8460576	29.00	231.00	1071.92	6584.63	166.60	932.73	457.63	1.27	7.75	0.00	0.46	6,64,179.23	26,34,440.76	0.00	73,220.88	33,71,840.88
04	1904	25500000	9520	0	5606000	5606000	0.00	0.00	1521.94	9349.09	110.10	616.44	1275.00	1.63	9.97	0.00	1.28	8,55,192.40	33,88,278.43	0.00	2,04,000.00	44,47,470.83
05	1947	67269654.5	9735	0	3758012	3758012	0.00	0.00	1556.32	9560.23	73.81	413.23	3363.48	1.63	9.97	0.00	3.36	8,54,184.84	33,90,976.46	0.00	5,38,157.24	47,83,318.53
06	1632	15048037.9	8160	300000	7932549	8232549	87.00	693.00	1304.52	8013.50	163.00	912.46	752.40	1.55	9.62	0.00	0.75	8,14,568.12	32,70,449.12	0.00	1,20,384.30	42,05,401.54
07	1797	22372857.1	8985	0	7366841	7366841	0.00	0.00	1436.42	8823.69	144.68	810.06	1118.64	1.58	9.63	0.00	1.12	8,28,496.41	32,75,475.55	0.00	1,78,982.86	42,82,954.82
08	1873	16460367.81	9365	0	2696676	2696676	0.00	0.00	1497.17	9196.87	52.96	296.53	823.02	1.55	9.49	0.00	0.82	8,12,267.01	32,27,755.40	0.00	1,31,682.94	41,71,705.36
09	1365	52211250	6825	250000	1325672	1575672	72.50	577.50	1091.10	6702.47	32.04	179.27	2610.56	1.20	7.46	0.00	2.61	6,26,513.41	25,36,142.55	0.00	4,17,690.00	35,80,345.96
10	960	15823600	4800	200000	230295	430295	58.00	462.00	767.37	4713.83	9.32	52.12	791.18	0.83	5.23	0.00	0.79	4,37,377.60	17,77,502.88	0.00	1,26,588.80	23,41,469.28
11	1540	27200000	7700	300000	383398	683398	87.00	693.00	1230.98	7561.76	14.73	82.36	1360.00	1.33	8.34	0.00	1.36	6,98,342.47	28,34,621.36	0.00	2,17,600.00	37,50,563.83
12	1728	7225000	8640	200000	6100000	6300000	58.00	462.00	1381.26	8484.89	124.60	697.56	361.25	1.56	9.64	0.00	0.36	8,19,465.13	32,79,110.80	0.00	57,800.00	41,56,375.93
13	1479	18229100	7395	400000	0	400000	116.00	924.00	1182.22	7262.24	9.60	53.60	911.46	1.31	8.24	0.00	0.91	6,85,300.26	28,01,545.19	0.00	1,45,832.80	36,32,678.25
14	1444	14824000	7220	200000	0	200000	58.00	462.00	1154.25	7090.38	4.80	26.80	741.20	1.22	7.58	0.00	0.74	6,37,733.15	25,76,921.38	0.00	1,18,592.00	33,33,246.53
15	1504	22796150	7520	300000	0	300000	87.00	693.00	1202.21	7384.99	7.20	40.20	1139.81	1.30	8.12	0.00	1.14	6,79,318.02	27,60,186.20	0.00	1,82,369.20	36,21,873.42
16	1911	8925000	9555	100000	7234137	7334137	29.00	231.00	1527.54	9383.46	144.48	808.87	446.25	1.70	10.42	0.00	0.45	8,91,333.73	35,43,930.97	0.00	71,400.00	45,06,664.70
17	778	6601950	3890	200000	338871	538871	58.00	462.00	621.89	3820.16	11.46	64.06	330.10	0.69	4.35	0.00	0.33	3,62,263.47	14,77,716.75	0.00	52,815.60	18,92,795.82
18	1092	17340000	5460	400000	463105	863105	116.00	924.00	872.88	5361.98	18.70	104.52	867.00	1.01	6.39	0.00	0.87	5,27,969.53	21,72,770.19	0.00	1,38,720.00	28,39,459.72
																		1,26,21,907.69	5,06,68,595.50	0.00	34,42,302.61	6,67,32,805.79
																						Rs 6.68 Crores

Table 13.19: Emissions from Transportation of Construction Material & Damage Cost

Package	Topsoil & muck (Kg/day)				Working days considered	Emission from Transportation of CA, FA, Steel and Cement (kg/day)				Total Emission from Transportation (Kg/day)				Total Emission from Transportation (Kg)				Damage Cost due to Emission from Transportation (Rs lakh)				Total Damage Cost (Rs lakh)
	PM 2.5	PM 10	NOX	SOX		PM 2.5	PM 10	NOX	SOX	PM 2.5	PM 10	NOX	SOX	PM 2.5	PM 10	NOX	SOX	PM 2.5	PM 10	NOX	SOX	
01	4.12	12.67	0.91	0.0028	648	0.68	2.09	0.03	0.00	9.32	28.64	1.55	0.01	8445.09	25960.83	1406.27	5.33	44.25	88.27	1.35	0.01	133.88
02	1.43	4.40	0.33	0.0010	190	0.07	0.22	0.00	0.00	9.00	27.66	1.13	0.01	5829.75	17921.07	729.69	3.65	30.55	60.93	0.70	0.01	92.19
03	7.84	24.10	2.02	0.0062	712	0.24	0.74	0.01	0.00	8.86	27.23	2.15	0.01	1682.87	5173.26	408.41	1.31	8.82	17.59	0.39	0.00	26.80
04	5.12	15.73	0.94	0.0029	964	4.16	12.78	0.15	0.00	23.07	70.92	2.15	0.01	16426.41	50495.99	1530.63	8.34	86.07	171.69	1.47	0.01	259.24
05	1.70	5.23	0.62	0.0009	354	1.72	5.29	0.06	0.00	9.46	29.07	1.37	0.00	9117.06	28026.50	1317.53	4.57	47.77	95.29	1.26	0.01	144.34
06	3.80	11.67	1.61	0.0025	665.5	0.15	0.46	0.01	0.00	6.95	21.37	1.99	0.00	2460.38	7563.38	704.16	1.53	12.89	25.72	0.68	0.00	39.29
07	3.38	10.40	1.31	0.0020	942.5	1.01	3.11	0.04	0.00	24.63	75.72	2.46	0.01	16391.64	50389.10	1634.69	8.71	85.89	171.32	1.57	0.01	258.80
08	1.30	4.00	0.46	0.0007	494	1.10	3.37	0.04	0.00	9.31	28.63	1.28	0.00	8776.86	26980.71	1206.07	4.23	45.99	91.73	1.16	0.01	138.89
09	0.71	2.17	0.37	0.0006	403.5	0.02	0.07	0.00	0.00	99.80	306.78	12.23	0.07	49299.81	151551.28	6041.17	32.31	258.33	515.27	5.80	0.05	779.46
10	0.11	0.35	0.14	0.0002	628.5	0.05	0.14	0.01	0.00	6.57	20.19	1.28	0.01	2650.68	8148.39	518.02	2.62	13.89	27.70	0.50	0.00	42.10
11	0.30	0.92	0.14	0.0002	203	0.00	0.01	0.00	0.00	5.59	17.19	1.31	0.00	3514.27	10803.11	820.46	2.13	18.41	36.73	0.79	0.00	55.94
12	2.89	8.88	1.17	0.0018	382.5	0.22	0.69	0.01	0.00	3.86	11.86	1.25	0.00	782.92	2406.75	254.31	0.47	4.10	8.18	0.24	0.00	12.53
13	0.17	0.53	0.09	0.0001	320.5	0.03	0.08	0.00	0.00	9.53	29.29	1.17	0.01	3644.52	11203.52	447.55	2.31	19.10	38.09	0.43	0.00	57.62
14	0.09	0.26	0.04	0.0001	480	0.01	0.02	0.00	0.00	5.30	16.29	0.60	0.00	1698.65	5221.78	193.36	1.12	8.90	17.75	0.19	0.00	26.84
15	0.13	0.40	0.06	0.0001	727	0.03	0.09	0.00	0.00	11.92	36.63	1.26	0.01	5720.04	17583.82	603.89	3.57	29.97	59.78	0.58	0.01	90.34
16	3.36	10.34	1.23	0.0019	213	2.64	8.12	0.10	0.00	12.22	37.58	2.05	0.01	8886.40	27317.46	1493.31	4.57	46.56	92.88	1.43	0.01	140.89
17	0.24	0.73	0.22	0.0003		0.04	0.11	0.00	0.00	1.97	6.06	0.66	0.00	419.66	1290.07	140.37	0.52	2.20	4.39	0.13	0.00	6.72
18	0.38	1.18	0.25	0.0004		0.13	0.41	0.01	0.00	8.51	26.15	1.69	0.01	4878.00	14995.32	969.43	4.20	25.56	50.98	0.93	0.01	77.48
Total																		**789.27**	**1574.31**	**19.60**	**0.15**	**2383.33**
Rs 23.83 Crore																						

13.7.4 Damage Assessment of Noise Environment

During period of construction under violation, the physical impact on noise environment had been in the form of increase in noise levels at project site and settlement which are very close to construction site. But the impact was temporary in nature, reversible, direct and for short period. Blasting generates instantaneous and impulsive noise for short duration. It has been established under section 13.5.2 that the resultant noise levels due to construction activity and corresponding background level at locations about 480 m are less than the standard values and there will be increase in noise levels ranging from 0.1dB(A) to 2.1dB (A) during day time and 1.2dB(A) to 3.8dB (A) during night time, which is insignificant.

The impact due to noise and vibration on surrounding environment is assumed moderate, and damage for same is calculated as per latest CPCB guideline as directed by NGT. The damage cost considered is Rs.50, 000/- per month in respect of such contract packages for which more than 50% of work is completed, and for packages where completion progress is lesser than 50%, cost is taken for initial one year alone **(Table 13.20)**.

Table 13.20: Cost Assessment of Damage as Per CPCB Noise Rules, 2000

Package Number.	Work Commence Date	Date Of Halt of Work	Years Of Violation	Percentage of work completed	Damage Cot @Rs.50,000 Per Month (Rs Lakh)
1	06-07-2016	22-11-2021	5.38	42.37	6.00
2	10-08-2016	31-10-2021	5.23	89.44	25.50
3	24-06-2016	31-10-2021	5.36	72.30	22.04
4	26-07-2016	22-11-2021	5.33	66.62	31.30
5	21-07-2016	31-10-2021	5.28	47.12	6.00
6	13-07-2016	11-11-2021	5.33	90.66	26.83
7	06-10-2016	21-11-2021	5.13	55.05	29.54
8	19-09-2016	07-11-2021	5.16	48.00	6.00
9	03-10-2016	18-11-2021	5.13	80.00	22.44
10	29-07-2017	16-11-2021	4.30	71.00	15.78
11	30-10-2016	20-11-2021	5.06	63.35	25.32
12	19-05-2016	13-11-2021	5.49	74.00	28.41
13	18-10-2016	31-10-2021	5.04	69.87	24.31
14	18-10-2016	31-10-2021	5.04	58.33	23.74
15	18-10-2016	31-10-2021	5.04	84.32	24.72
16	09-04-2016	31-10-2021	5.56	36.00	6.00
17	03-10-2019	31-10-2021	2.08	58.23	12.79
18	06-07-2018	31-10-2021	3.32	48.38	6.00
Total					**342.72**

13.7.5 Damage Assessment for Impact on Ecology and Biodiversity

The nearest distance of the Phase-I project component is 11.95 km from Amarabad WLS and 2.56km from buffer area of Amarabad Tiger reserve (Rc.No.6531/2016/FCA-1/TS, dt; 20.12.2016). However, no National Park, WLS, Défense Establishments, Archaeological Monuments, Notified Eco-sensitive areas or

protected area under Wild Life (Protection) Act exists within 10 km distance from the command area under Phase-II.

During period of violation for executing work under phase-1, the impacts have occurred in the form of habitat reduction and loss of forest cover and disturbance to fauna of the area because of working in forest land diverted for construction of Anjanigiri reservoir and pumphouse of stage-1.

For execution of Wildlife and Biodiversity Plan for Stage-1 works Rs 161 crore have been deposited with the Forest Department by Project Proponent while meeting demand against cost of diversion of forest land. Therefore, Wildlife and Biodiversity Plan is deemed as executed.

For Stage -II works, Wildlife and Biodiversity Plan has been approved by the Forest Department for Rs 539 lakh comprising of Rs269 as capital cost and Rs 270 lakh as recurring cost for 5 years. This amount shall be deposited to the forest Department for executing Deposit Works once EC is accorded to project.

There are some of the ingredients of the plan like on which annual expenditure has to be incurred. Some of such ingredients are maintenance of tree groves, dens, bushy structure and roosting and nesting sites; maintenance of plantation of suitable fruit & flower bearing plant species in the area so that the wild herbivores animals can reside within the forest; maintenance monitoring wildlife through E-eye (E-Surveillance) to prevent man-animal conflict.

Lump sum amount of Rs 161 lakh demanded by the Forest Department against Wildlife and Biodiversity Plan had no bifurcation like capital cost and recurring cost. Based on the pro rata cost of capital cost and recurring annual cost against Wildlife and Biodiversity Plan for Stage-II, the recurring cost for 5 years for Stage-I works out as Rs 82 lakh. Thus, total environment compensation/damage on account of Wildlife Conservation and Biodiversity Plan works out to Rs 82 lakh.

13.7.6 Impact on Water Environment

During period of construction under violation, for meeting requirement of water for construction and domestic purpose, neither any underground water structure was constructed nor it was met from any existing well/tube well has been met. The requirement of water was met from existing reservoirs nearest to the work locations, without creating extra stress on any surface water source. The construction activities did not intersect the GW table, thereby causing no qualitative and quantitative impact on ground water resources.

13.7.6.1 Water Population due to Disposal of Sewage

The disposal of untreated sewage can lead to water pollution, resulting in increase in coliforms and other various pathogens, which can lead to incidence of water borne diseases. Therefore, to avoid any deterioration in water quality due to disposal of untreated sewage from labour camps, appropriate sewage treatment facilities were proposed to be commissioned in the labour camps. The sewage waste shall be disposed after treatment through STP/soak pits. In all 18 packages for sewage disposal in labour camps, the contractors have resorted to septic tank/soak pits, irrespective of quantity of sewage generated. However, under section 4.3 (ii) of CGWA Notification, S.O. 3289(E), dated 24th September, 2020, the following mandatory requirement has been spelled in respect of new infrastructure projects.

“Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m3/day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc.”

Drinking and domestic water requirement has been worked out for rural area as per National Building Code 2016, BIS for Estimation of Water Requirements for drinking and domestic use for population up to 20000. The quantity of sewage generation has been worked out @ 90% of water requirement.

As per Report of the CPCB In-house Committee on Methodology for Assessing Environmental Compensation and Action Plan to Utilize the Fund, the Committee has suggested that environmental compensation in these cases should be comprised of two components i.e.

1. Cost saved/benefits achieved by the concerned individual/authority by not having proper waste/sewage management system; and

2. Cost to the environment (environmental externality) due to untreated/partially treated waste/sewage because of insufficient capacity of waste/sewage management/treatment facility

Generalized formula for Environmental Compensation adopted is:

Environmental Compensation = Total years of operation X (Capex 10% + Annual Operation cost+ Environmental Externality).

In the wake of proviso under Notification, S.O. 3289(E), dated 24th September, 2020, and also complying with avoidance cost method / replacement cost method with Externalities adopted by CPCB in-house committee report of 2018, the cost saved / environment compensation / damage is assessed for all the 18 Packages of which 10 packages are exempted since they require soak pits and they have been provided by the P.P **(Table13.21).**

Environmental compensation is based on following:

For 35 KLD CAP – Capex - Rs.18 Lakh; Annual Opex – Rs. 1.8 Lakh; Env. Externality – Rs.180/ Day

For 25 KLD CAP – Capex - Rs.15 Lakh; Annual Opex – Rs. 1.5 Lakh; Env. Externality – Rs.180 / Day

Table 13.21: Environmental Compensation for Non-Provision of STP

Package Number	Days	Local labour	Camp labour	Requirement for local @25lpcd (KLD)	Requirement @70lpcd for camp labour (KLD)	Total Water Demand KLD	Sewage generation @90% (KLD)	STP Capacity (KLD)	Period in year	Capex (Rs lakh)	O&M (Rs lakh)	Externality (Rs lakh)	Total (Rs lakh)
1	1965	390	390	9.75	27.30	37.05	33.35	35	5.38	9.68	9.68	3.54	22.90
2	1908	250	250	6.25	17.50	23.75	21.38	25	5.23	7.85	7.85	3.43	19.13
3	1956	125	125	3.13	8.75	11.88	10.69	0	5.36	0	0	0.00	0.00
4	1945	225	225	5.63	15.75	21.38	19.24	0	5.33	0	0	0.00	0.00
5	1928	225	225	5.63	15.75	21.38	19.24	30	5.28	9.5	9.5	3.47	22.47
6	1947	63	63	1.56	4.38	5.94	5.34	0	5.33	0	0	0.00	0.00
7	1872	200	200	5.00	14.00	19.00	17.10	0	5.13	0	0	0.00	0.00
8	1885	375	375	9.38	26.25	35.63	32.06	35	5.16	9.29	9.29	3.39	21.97
9	1872	145	145	3.63	10.15	13.78	12.40	0	5.13	0	0	0.00	0.00
10	1571	110	110	2.75	7.70	10.45	9.41	0	4.30	0	0	0.00	0.00
11	1847	245	245	6.13	17.15	23.28	20.95	25	5.06	7.59	7.59	3.32	18.50
12	2004	75	75	1.88	5.25	7.13	6.41	0	5.49	0	0	0.00	0.00
13	1839	262	262	6.55	18.34	24.89	22.40	25	5.04	7.56	7.56	3.31	18.43
14	1839	184	184	4.60	12.88	17.48	15.73	0	5.04	0	0	0.00	0.00
15	1839	156	156	3.89	10.89	14.77	13.30	0	5.04	0	0	0.00	0.00
16	2031	300	300	7.50	21.00	28.50	25.65	25	5.56	8.34	8.34	3.66	20.34
17	759	125	125	3.13	8.75	11.88	10.69	0	2.08	0	0	0.00	0.00
18	1213	250	250	6.25	17.50	23.75	21.38	25	3.32	4.98	4.98	2.18	12.14
Total	**32220**	**3704**	**3704**	**92.60**	**259.28**	**351.88**	**316.692**	**-**	**-**	**64.79**	**64.79**	**26.30**	**155.88**

13.7.7 Cost Saving from Partial Implementation of Provision under Sanitation Plan

Under Sanitation plan, it is proposed to provide toilets for labour residing in camps apart from daily cleaning of the camp areas, anti-malaria spray, developing simple composting unit, e-waste management etc. Many of these items like construction of toilets, daily cleaning of labour camp area, provision of storage vats and dust bins have been implemented as devised while some have not been implemented which has resulted in cost saving. The aggregate cost saving for these items of works for each camp works out to Rs 6 lakh/year and about Rs 3000/head /year. As the labour camps have been functional during construction period it can be held that at least sixty percent of expenditure must have been incurred under this head. Thus, a saving of Rs 1200/head /year has accrued. Package wise cost saving has been worked out in **Table 13. 22**.

Table 13.22: Cost Saving from Partial Implementation of Provision Under Sanitation Plan

Package Number	Total manpower	Total labour in camps	Total No of working days	Number of years	Cost saving @ Rs 1200/head /year (Rs lakh)
1	780	390	1596	5.23	24.48
2	500	250	1551	5.09	15.27
3	250	125	1341	4.40	6.60
4	450	225	1904	6.24	16.85
5	450	225	1947	6.38	17.23
6	125	63	1632	5.35	4.04
7	400	200	1797	5.89	14.14
8	750	375	1873	6.14	27.63
9	290	145	1365	4.48	7.80
10	220	110	960	3.15	4.16
11	490	245	1540	5.05	14.85
12	150	75	1728	5.67	5.10
13	524	262	1479	4.85	15.25
14	368	184	1444	4.73	10.44
15	311	156	1504	4.93	9.23
16	600	300	1911	6.27	22.57
17	250	125	778	2.55	3.83
18	500	250	1092	3.58	10.74
Total	**7408**	**3705**	**27442**	**89.97**	**230.19**

13.7.8 Cost Saving from Partial Implementation of Provision under Fuel Wood Saving Devices

Under Energy Conservation plan, it is proposed to provide LPG connection for cooking, kerosene and electricity for lighting purposes, besides providing Solar water heater in dormitory of labour for supply of hot water during winter. It has adduced form inmates of labour camp that the plan has not been implemented as devised which has resulted in cost saving. The cost of plan has major component of debit-able cost of fuel wood substitute and other energy saving devices and for each camp it works out to Rs 6.70 lakh/year and about Rs 1900/head /year. As the labour camps have been functional during construction period it can be held that at least half of expenditure must have been incurred under this

head. Thus, a saving of Rs 950/head /year has accrued. Package wise cost saving has been worked out in **Table 13. 23.**

Table 13.23: Cost Saving from Partial Implementation of Fuel Wood Saving Devices

Package Number	Total manpower	Total labour in camp	Total No of working days	Number of years	Cost saving @ Rs 950/head /year (Rs lakh)
1	780	390	1596	5.23	19.38
2	500	250	1551	5.09	12.09
3	250	125	1341	4.40	5.23
4	450	225	1904	6.24	13.34
5	450	225	1947	6.38	13.64
6	125	63	1632	5.35	3.20
7	400	200	1797	5.89	11.19
8	750	375	1873	6.14	21.87
9	290	145	1365	4.48	6.17
10	220	110	960	3.15	3.29
11	490	245	1540	5.05	11.75
12	150	75	1728	5.67	4.04
13	524	262	1479	4.85	12.07
14	368	184	1444	4.73	8.27
15	311	156	1504	4.93	7.31
16	600	300	1911	6.27	17.87
17	250	125	778	2.55	3.03
18	500	250	1092	3.58	8.50
Total	**7408**	**3705**	**27442**	**89.97**	**182.24**

13.7.9 Cost Saving from Partial Implementation of Provision under Occupational Health & Safety

Under Occupational Health & Safety Plan for employees engaged in construction projects medical examination of employees at the initial stage and periodically for one fifth of strength of labour, shall be done by a team of qualified medical officers provided by the project proponent. The labour shall be provided with PPE as per requirement of duty in which they are engaged. Based on the provisions of the plan and that the plan has not been fully implemented by the contractors, saving in cost has accrued which is being assessed as Rs 1000 per head for every 2 years during number of years of employment as shown in **Table13.24**.

Table 13.24: Cost Saving from Partial Implementation of Provision under OHS

Package Number	Total manpower	Total No of working days	Number of years	Damage Cost @ Rs 1000/head for every 2 years (Rs lakh)
1	780	1596	5.23	20.41
2	500	1551	5.09	12.71
3	250	1341	4.40	5.50
4	450	1904	6.24	14.05
5	450	1947	6.38	14.36
6	125	1632	5.35	3.34
7	400	1797	5.89	11.78

8	750	1873	6.14	23.03
9	290	1365	4.48	6.49
10	220	960	3.15	3.46
11	490	1540	5.05	12.37
12	150	1728	5.67	4.25
13	524	1479	4.85	12.70
14	368	1444	4.73	8.71
15	311	1504	4.93	7.67
16	600	1911	6.27	18.80
17	250	778	2.55	3.19
18	500	1092	3.58	8.95
Total	**7408**	**27442**	**89.97**	**191.77**

13.7.10 Economic Benefits Accrued During Violation

The economic benefits due to project are in the form of direct benefit resulting from revenue created due to services provided under the project. Besides this the environmental compensation (cost saved in EMP Expenditure)-vide MOEF guideline/Notification and CPCB is also considered as benefit.

13.7.10.1 Direct Profit/Benefit from Project during Violation Period

The PRLIS once commissioned shall provide net annual benefits from increased irrigation potential besides revenue from Domestic water supply, industrial water supply and fisheries. Presently neither any reservoir nor pumphouses and water conductor system involved in various stage lift is complete nor filling of any reservoir is accomplished, thus there is no profit gained during violation period.

13.7.10.2 Costs Saved against Environmental Management Plan

Environmental Management Plans are devised so that these are implemented concurrently with the construction activities. This is cardinal principle of sustainable development. Some of the Environmental Management Plan like Catchment Area Plan, Compensatory Afforestation Plan, Wildlife and Biodiversity Plan are implemented through Forest Department for which funds have been provided by the Project Proponent and are deemed as executed. Fisheries Management Plan shall be got implemented through the State Fisheries Department once the reservoirs and water conductor system to connecting reservoirs are completed and reservoirs are filled. It is pre-mature to implement Landscape and Restoration Plan as the work of pumphouses is not completed and the landscaping cannot be undertaken in such circumstances. Disaster Management Plan can't be implemented at this stage as reservoirs are incomplete and the work of spill ogee and control room is yet to be completed. This plan mainly involves Installation of alert system in control room of each pump house, reservoir surplus weir; setting up of piezometer on down stream of reservoir, public information system besides Training and miscellaneous, which shall be carried out after completion of reservoir embankment. in pursuant to the Ministry OM dated 30.09.2020, concerns raised during public hearing which were committed for addressal by the project proponent and prescribed as a specific condition by EAC/SEAC while recommending of EC, shall be addressed/undertaken for implementation by the project proponent after EC is accorded to the PRLIS. Avoidance/substitution cost saved in respect of EMP is given in **Table 13.25.**

Table 13.25: Avoidance/Substitution Cost Saved in Respect of Environmental Management Plan

Package	Plans	Phase-I	Capital Cost	Avoidance Cost Saved @10% per year	Cost saved Rs Lakhs	Recurring Cost Saved (Rs lakh)	Total Cost saved/EC Rs Lakhs	Remark
1	Catchment Area Treatment Plan	248.66	248.66	0	0	0	0	Rs 248.66 lakh deposited with Forest Department
2	Command Area Development Plan	00.00	0.00	0	0	0	0	No applicable for Phase-I, as no ayacut is served
3	Compensatory Afforestation Scheme	5856.00	5856.00	0	0	0	0	Rs 5856 lakh deposited with Forest Department
4	Wildlife and Bio-diversity Management plan	161.00	161.00	0	0	0	0	Rs 161 lakh deposited with Forest Department
5	Fisheries Management Plan	1752.00	0	0	0	0	0	Plan shall be implemented once the reservoirs are filled
6	Resettlement & Rehabilitation Plan	331592.00	190985	0	0	0	0	Balance Payment of land &RR under process.
7	Green Belt Development Plan	81.00	0	0	0	0	0	Damage as Assessment (Rs533.98 lakh) separately made
8	Reservoir Rim Treatment Plan	270.00	215	60%	162	55	217	
9	Muck Management Plan	2380.00	2215	60%	1329	165	1494	
10	Landscape and Restoration Plan	39.00	0	0	0	0	0	Pre-mature to implement plan as the work of pumphouses is not completed and the landscaping cannot be undertaken in such circumstances
11	Restoration Plan for Quarry Sites	62.00	25	60%	15	37	52	
12.	Disaster Management Plans	55.00	0	0	0	0	0	Plan can't be implemented as reservoirs are incomplete
13	Water, Air and Noise Management Plan	678.00	-	-	-	-	-	Damage as Assessment separately made
14	Ground Water Management	170.00	170	60%	102	0	102	
`15	Public Health Delivery Plan	240.00	50	60%	30	190	220	
16	Labour Management Plan	375.00	-	-	-	-	-	Damage as Assessment separately made
17	Sanitation and Solid Waste Management Plan	1500.00	-	-	-	-	-	Damage as Assessment separately made
18	Local Area Management Plan	450.00	-	-	-	-	-	Dealt Separately under P.H compliance as per OM 30-9-2020
19	Environmental Safeguards i/c Road Construction	194.00	-	-	-	-	-	Spent during construction
20	Energy Conservation Measures	500.00	-	-	-	-	-	Damage as Assessment separately made
21	Environmental Monitoring Plan	177.00				177	177	
	Total	**346780.66**			**1638**	**624**	**2262**	

13.8 SUMMARY OF ENVIRONMENTAL DAMAGE COST

The summary of various environment damage cost as contained in this chapter is enumerated in **Table-13.26**.

Table 13.26: Summary of Environmental Damage Cost

S.N.	Environment Attributes	Damage cost (Rs lakh)
1	Land Environment	
(i)	Cost Compensation due to Improper Implementation of Muck Management	520.78
(ii)	Cost Compensation due to incomplete Implementation of Green Belt	1773.40
(iii)	Cost Compensation due to Partial Management of Solid Waste	368.00
2	Air Environment	
(i)	Damage Cost due to emission from excavation/Quarrying	5087.86
(ii)	Damage Cost due to emission from Dozing (Heavy Construction)	667.32
(iii)	Damage Cost due to emission from Transportation of construction Material	2383.33
3	Noise and Vibration	342.72
4	Wildlife Conservation and Biodiversity Plan	82.00
5	Water Environment (Compensation for Non-Provision of STP)	155.88
6	Cost Saving from Partial Implementation of Provision Under Sanitation Plan	230.19
7	Cost Saving from Partial Implementation of Fuel Wood Saving Devices	182.24
8	Cost Saving from Partial Implementation of Provision under OHS	191.77
9	Avoidance/Substitution cost saved in respect of other EMP	2262.00
Total		14247.49

13.9 REMEDIAL, NATURAL RESOURCE &COMMUNITY RESOURCE AUGMENTATION PLANS

The project proponent had been refrained from causing further endamage to environment and as principal polluter is responsible to compensate for causing damage to the environment. The project 34th proponent has to undertake activities relating to Remedial Plan and Community Augmentation Plan in an effort to restore the environmental damage afflicted including its implication on social aspects. The EAC in its meeting held on 14th September,2022, has directed the project proponent to prepare EMP comprising remediation plan and natural and community resource augmentation plan corresponding to the ecological damage assessed and economic benefits derived due to violation.

13.9.1 Settlement Near to Project Area

Due to linear configuration of project, the work under the project is not concentrated at one point but spatially spread. The human settlement which are within 3 km from the project area under Phase-I works have been considered as project impact villages (Table13.2). There are in all 58 villages which can be categorised as project impact villages of which 43 are covered in 8 mandals of Nagarkurnool district and 15 in 3 mandals of Mahabubnagar district.

Table 13.27: Inventory of Villages Near to the Project Area Under Phase-1

S.N.	District	Mandal	Village	Remark
1	Nagarkurnool	Kollapur	Narlapur	1.00 Km from Anjanagiri Reservoir
2			Kudikilla	2.00 Km from Open canal (PKG-3)
3			Yelluru	3 to 4 km from Stage-1 PH and Open canal
4		Peddakothapally	Sathapur	1 Km from Tunnel (PKG-4)
5			Kalwakole	3 km from Open canal (PKG-3)
6			Chennapuraopalli	2.75 Km from Tunne l(PKG-4)
7			Jonnalaboguda	0.50 km from Tunnel (PKG-4)
8			Vennacherla	2.50 Km from Stage-3 Pumphouse
9		Kodair	Pasupula	2.00 Km from Tunnel (PKG-4)
10			Bawaipalli	1.50 Km from Veeranjeneya Resr. & Stage-2 PH
11			Janumpalle	1.50 Km from Veeranjeneya Reservoir
12			Theegalapalle	1.00 Km from Veeranjeneya Reservoir
13		Revally	Yedula	1.00 Km from Veeranjaneya Reservoir
14			Revally	1.00 Km from Open canal (PKG-6)
15			Ananthapuram	1.25 Km from Veeranjaneya Reservoir
16			Nagapur	0.50 Km from Open canal (PKG-6)
17			Shanaipalle	0.75 Km from Open canal (PKG-6)
18		Nagarkurnool	Uyyalavada	1.50 Km from Tunnel (PKG-7)
19			Nagarkurnool	2.00 Km from Tunnel (PKG-7)
20			Peddapuram	1.50 Km from Tunnel (PKG-7)
21			Gudipalle	1.50 Km from Tunnel (PKG-7)
22			Sripuram	0.75 Km from Tunnel (PKG-7)
23			Bondalapalle	1.25 Km from Tunnel (PKG-7)
24			Kummera	0.75 Km from Stage-3 Pump house
25		Bijinepally	Karukonda	0.50 Km from Venkatadri Reservoir
26			Vasanthapur	2.00 Km from Tunnel (PKG-7)
27			Vattem	1.50 Km from Venkatadri Reservoir
28			Gudla Narva	3.25 Km from Venkatadri Reservoir
29		Tadoor	Thummalasugur	2 Km from Venkatadri Reservoir &Stage-3 PH
30			Yatmatapur	2.25 Km from Stage-3 Pumping Station
31		Thimmajipet	Pothireddipally	0.50 Km from Venkatadri Reservoir
32			Gummakonda	1.00 Km from Open Canal (PKG-12)
33			Gummakonda T	0.20 Km from Open canal
34			Venkaipally	0.50 Km from Venkatadri Reservoir
35			Koduparthy	2.00 Km from Venkatadri Reservoir
36			Koduparthy Mitta	0.20 Km from Open canal (PKG-12)
37			Gorita Thanda	2.25 Km from Open canal(pkg-12)
38			Bajipur Thanda	2.40 Km from Open canal (PKG-12)
39			Thimmajipet	2.30 Km from Open canal (PKG-12)
40			Appajipalle	2.25 Km from Open canal (P-12)
41			Vedirepalle	3.40 Km from Open canal
42			Gorita	2.00 Km from Kurumurthyraya Reservoir
43			Chegunta	2.50 Km from Kurumurthyraya Reservoir
44	Mahabubnagar	Bhoothpur	Yelkicherla	3.50 Km from Kurumurthyraya Reservoir
45			Karvena	0.50 Km from Kurumurthyraya Reservoir
46			Bhattupally	0.50 Km from Kurumurthyraya Reservoir
47			Kothur	0.50 Km from Kurumurthyraya Reservoir
48			Divitipally	3.00 Km from Kurumurthyraya Reservoir
49		Jadcherla	Aloor	2.00 Km from Kurumurthyraya Reservoir
50			Malleboinapalle	1.50 Km from Tunnel (PKG-16)
51			Polepalle	3.50 Km from Udandapur Reservoir
52			Kistaram	0.85 Km from Udandapur Reservoir
53			Khanapur	1.00 Km from Udandapur Reservoir

54			Thadiparthy	1.00 Km from Kurumurthyraya Reservoir
55		Nawabpet	Karukonda	1.00 Km from Udandapur Reservoir
56			Siddotam	3.00 Km from Udandapur Reservoir
57			Theegalapally	0.50 Km from Udandapur Reservoir
58			Kuchoor	0.50 Km from Udandapur Reservoir

13.9.2 Remediation Plan

During period of violation damage has been caused to various environmental attributes in the settlement area in vicinity of the project work area. The discharge of air pollutants was from non-ducted emissions and was within the prescribed NAAQS,2009, and had not crossed the limits for any pollutant like PM10, PM2.5, NOX and SO2. The resultant noise levels at 480m distance are less than the standard values. The plan includes activities like plantation in vacant land belonging to village panchayats so that the trees act as wind barrier in addition to providing fruits and fodder. Apart from this avenue plantation along village roads as a measure to develop carbon sink in the area besides improving the aesthetics. For environment friendly removal of dusts from village roads supply of battery-powered Ride on Road Sweeper shall be handed over to village panchayats. The cost of activities proposed under the plan are enumerated with annual budget in **Table 13.28.**

13.9.3 Natural Resource Augmentation Plan

During period of violation damage the natural resources have been impacted for augmentation of which certain measures have been devised under this plan. The plan includes activities like reclamation of dump sites through conversion into community nursery; besides promoting agriculture activities through supply of quality seeds. For promoting solar energy amongst villagers, solar street light shall be installed in villages and handed over to village panchayat. Subsidies shall be given for encouraging use of solar pumps to draw water for micro irrigation in the area. The cost of activities proposed under the plan are enumerated with annual budget in **Table 13.29.**

13.9.4 Community Resource Augmentation Plan

The plan includes activities like Updating/renovation/ repair of public buildings like Community Centres, Library, Yuva (Youth) Mandal Centres, Anganwadi/Gymnasium and Public Toilets. Strengthening of public health care system through suppling of ambulances with basic life care amenities, installation of medical equipment's like X- ray machine, vitals monitors, stretchers, wheelchair and furniture and installation of Haemodialysis Machine with RO System and Neo Natal Ventilators in CHC and District Hospitals. The cost of activities proposed under the plan are enumerated with annual budget in Table **13.30**.

Table 13.28: Remediation Plan with Year wise Break-up of Budget

S.N.	Environmental Attribute	Plan Activity	Location	Quantity	Unit Rate (Rs)	Total Budget (Rs lakh)	Year wise Break-up		
							I-Year	II-Year	III-Year
1	Air & Noise								
(a)		Avenue plantation @ 5000 Nos/ village and areas between project and habitation with 3 years maintenance and cost of tree guard.	58 villages	290000	800/tree	2320.00	928.00	928.00	464.00
(b)		Community plantation /wind barriers in each of villages @ 1500 Nos/ village with 20% fruit bearing 30% fodder trees with 3 years maintenance	58 villages	87000	800/tree	696.00	280.00	280.00	136.00
(c)		Supply of battery-powered Ride on Road Sweeper, 1800 watt, 2000mm including O&M charges for 3 years.	58 villages	58	2000000/No.	1160.00	460.00	460.00	240.00
2	Water Environment								
(a)		Constructing RWH-Percolation tank one in each of PA villages	58 villages	58	1500000/each	870.00	345	345	180
(b)		1000 LPH SS RO Plant (ISI Standard) Including Storage Tanks and Installation 2 in each PA villages i/c 3-year maintenance	58 villages	116	400000/each	464.00	184	184	96
(c)		Renovation of water bodies like ponds, including desilting in nearby PA villages	58 villages	116	600000/each	696.00	278.40	278.40	139.20
3	Ecology& Biodiversity								
(a)		Development of grazing and pasture land with proper fencing in PA Villages close to reservoirs	20 villages	26	2500000/each	650.00	260.00	260.00	130.00
(b)		Construction of Botanical Park for conservation of local/endemic species	Nagarkurnool Mahabubnagar	2	10000000/each	200.00	80.00	80.00	40.00
(c)		Subsidy for intensive aquaculture in new ponds in areas nearby 5 reservoirs	Nagarkurnool Mahabubnagar	207	100000/person	207.00	80.00	80.00	47.00
Total						**7263.00**	**2895.40**	**2895.40**	**1472.20**

Table 13.29: Natural Resource Augmentation Plan with Year wise Break-up of Budget

S.N.	Environmental Attribute	Plan Activity	Location	Quantity	Unit Rate (Rs)	Total Budget (Rs lakh)	Year wise Break-up		
							I-Year	II-Year	III-Year
1 (a)	Land Environment	Reclamation of dump sites through conversion into community nursery sapling growing centre, 5 each in 2 districts, and issue of seeds and fertilizers for farmers located within 5 KM of project construction sites:	Nagarkurnool Mahabubnagar	10	2500000/each	250.00	100.00	100.00	50.00
(b)		Construction of Solid waste processing yard and supply & installation of machineries with handling capacity of 10 Tons per day (Wet & Dry Processing) each 2 each in 2 districts	Nagarkurnool Mahabubnagar	4	10000000/each	400.00	200.00	100.00	100.00
2 (a)	Energy Conservation	Providing Solar Street Lighting (40 Watt) 30 in each PA villages and 200 in villages abutting 5 reservoirs, i/c all accessories and 3 years maintenances	58 villages	2740	40000/each	1096.00	438.40	438.40	219.20
(b)		Subsidy for arranging and installation of Solar submersible water pumps (5 HP) i/c all accessories 3 years maintenances @ 10 Nos each in each of PA villages.	58 villages	580	200000/each	1160.00	464.00	464.00	232.00
Total						**2906.00**	**1202.40**	**1102.40**	**601.20**

Table 13.30: Community Resource Augmentation Plan with Year wise Break-up of Budget

S.N.	Environmental Attribute	Plan Activity	Location	Quantity	Unit Rate (Rs)	Total Budget (Rs lakh)	Year wise Break-up		
							I-Year	II-Year	III-Year
1	Air & Noise								
(a)		Updation/renovation/ repair of public buildings like Community Centres, Library, Yuva (Youth) Mandal Centres, Anganwadi/Gymnasium and Public Toilets in locations within 5 KM of project construction sites @15 locations each in 2 districts	Mandals	15	3000000/each	450.00	180.00	180.00	90.00
(b)		Construction of Bus Shelters one each in villages / towns nearby project area	58 villages	58	500000/No	290.00	115.00	115.00	60.00
2 (a)	Socio-economic	Supply of Ambulance with basic life care amenities one each to nearby Government Primary Health Centres /CHC /District Hospital,	PHC/CHC near the affected villages	31	2000000/each	620.00	240.00	240.00	140.00
(b)		Supply, installation, and 3 years maintenances of medical equipment's like X- ray machine, Vitals Monitors, Stretchers, Wheelchair and Furniture one set each in nearby village Government primary health centres / CHC hospital of project area	PHC/CHC near the affected villages	25	1000000/each	250.00	100. 00	100.00	50.00
(c)		Supply, installation, and 3 years maintenances of Haemodialysis machine with RO System and Neo Natal Ventilator 2 each in nearby CHC /district hospital of project area	CHC/District Hospital	20	5000000/each	1000.00	400.00	400.00	200.00
(d)		E-learning for schools by providing computers	Affected Village schools	147	1000000/each	1470.00	588.00	588.00	294.00
Total						**4080.00**	**1623.00**	**1623.00**	**834.00**

13.10 IMPACTS DUE TO PROJECT ACTIVITIES & REMEDIAL MEASURES

Impacts due to project activities on various environmental attributes including socio-economic aspects have been assessed elaborately under section Chapter-4. The main impacts on environ are brought out in brief hereunder:

- Land use class of 205.54 ha forest land diverted for Phase-I shall change into waterbody & built-up area.
- Due to project 5139 families shall be displaced due to submergence for phase -I works.
- Due to project 14,891 families shall be affected due to land acquisition for phase -II works
- Loss of agriculture land (22600ha) and agriculture produce.
- The maximum predicted GLC for pollutant PM10 due to excavation activities at Venkatadri reservoir and Udandapur reservoir was found to be 10.74µg/m^3 and 8.02µg/m^3 respectively.
- Due to increased transportation during construction phase predicted concentration for PM10 at 25m distance is 12.4 µg/m3, which reduces to 7.7 µg/m3, 3.4 µg/m3 and 1.4 µg/m3 at 50m, 150m and 500m respectively. Thus, the impact on the pollutant level (PM10) due to increased traffic due to transportation of mineral shall be minimal. The increased GLC in respect of NOx were insignificant being 0.13 µg/m3 up to 25m and 0.11 µg/m3 up to 50m and 0.10 µg/m3 up to 1km.
- The resultant noise levels due to construction activity and corresponding background level at locations about 480 m are less than the standard values and there will be increase in noise levels ranging from 0.1dB(A) to 2.1dB (A) during day time and 1.2dB(A) to 3.8dB (A) during night time, which is insignificant.
- The maximum predicted air over pressure shall be 109.8 dB(A), which is considerably lower than 120 dB(A) at which glass panes of windows get damaged.
- Due to blasting, the resulting PPV shall be between 1.71 mm/sec to 3.68mm/s which shall be considerably lower than the limiting values 5.0 mm/sec for excitation frequency less than 8 Hz, in case of temporary structures.
- After filling of reservoirs ground water recharge from seepage shall be 24.42MCM (0.86 TMC).

Remedial measures to mitigate the negative effects of the project construction and overall improvement of the environment management plans have been formulated for implementation concurrent to the project construction. The detailed provisions under each management plan with capital and recurring cost has been provided in sub-section **10.1** through **10.21** of the report and summarised in **Table 10.63**. The consolidated cost of EMPs and remediation plan along with natural and community resource augmentation plan has been elucidated under **Table13.31.**

Table 13.31: Combined Cost of EMPs and Remediation, Natural & Community Resource Augmentation Plan

S.N.	Plans	Phase-I	Phase-II	Total Cost	Capital cost	Annual Recurring					
						I-Yr	II-Yr	III-Yr	IV-Yr	V-Yr	Total
1	Catchment Area Treatment Plan	248.66	00.00	248.66	248.66	0.0	0.0	0.0	0.00	0.00	0.00
2	Command Area Development Plan	00.00	74985.00	74985.00	57945.00	5680	5680	5680	0.00	0.00	17040.00
3	Compensatory Afforestation Scheme	5856.00	00.00	5856.00	5856.00	0.0	0.0	0.0	0.00	0.00	0.00
4	Wildlife and Bio-diversity Management plan	161.00	539.00	700.00	430.00	54.0	54.0	54.0	54.0	54.0	270.00
5	Fisheries Management Plan	1752.00	100.00	1852.00	1813.00	13.0	13.0	13.0	0.00	0.00	39.00
6	Resettlement & Rehabilitation Plan	331592.00	156624.00	488216.00	488216.00	0.0	0.0	0.0	0.00	0.00	0.00
7	Green Belt Development Plan	81.00	2964.00	3045.00	2490.00	111.0	120.0	116.0	105.0	103.0	555.00
8	Reservoir Rim Treatment Plan	270.00	00.00	270.00	215.00	11.0	12.0	12.0	10.0	10.0	55.00
9	Muck Management Plan	2380.00	7125.00	9505.00	9064.00	147.0	147	147	0.00	0.00	441.00
10	Landscape and Restoration Plan	39.00	76.00	115.00	64.00	17.0	17.0	17.0	0.00	0.00	51.00
11	Restoration Plan for Quarry Sites	62.00	76.00	138.00	54.00	28.0	28.0	28.0	0.00	0.00	84.00
12.	Disaster Management Plans	55.00	35.00	90.00	84.00	2.0	2.0	2.0	0.00	0.00	6.00
13	Water, Air and Noise Management Plan	678.00	640.00	1318.00	358.00	320.0	320.0	320.00	0.00	0.00	960.00
14	Ground Water Management	170.00	1200.00	1370.00	1370.00	0.0	0.0	0.0	0.00	0.00	0.00
`15	Public Health Delivery Plan	240.00	600.00	840.00	142.80	232.4	232.4	232.4	0.00	0.00	697.20
16	Labour Management Plan	375.00	345.00	720.00	135.00	195.0	195.0	195.0	0.00	0.00	585.00
17	Sanitation and Solid Waste Management Plan	1500.00	1200.00	2700.00	1620.00	360.0	360.0	360.0	0.00	0.00	1080.00
18	Local Area Management Plan	450.00	3950.00	4400.00	4010.00	130.0	130.0	130.0	0.00	0.00	390.00
19	Environmental Safeguards i/c Road Construction	194.00	320.00	514.00	49.00	155.0	155.0	155.0	0.00	0.00	465.00
20	Energy Conservation Measures	500.00	400.00	900.00	272.25	209.25	209.25	209.25	0.00	0.00	627.75
21	Environmental Monitoring Plan	177.00	228.00	405.00	0.00	135.0	135.0	135.0	0.00	0.00	405.00
Total EMP		**346780.66**	**251407**	**598187.66**	**574436.71**	**7799.65**	**7809.65**	**7805.65**	**169**	**167**	**23750.95**
22	Remediation Plan	7263	-	7263	6419	0.00	211.00	211.00	211.00	211.0	844.00
23	Natural Resources Augmentation Plan	2906	-	2906	2735.00	0.00	57.00	57.00	57.00	0.00	171.00
24	Community Resources Augmentation Plan	4080	-	4080	4080.00	0.00	0.0	0.0	0.00	0.00	0.00
	Total (S. No. 22 S.No.23and S.No.24)	**14249**	-	**14249**	**13234.00**	**0.00**	**268.00**	**268.00**	**268.00**	**211.0**	**1015.00**
Grand Total		**361029.66**	**251407**	**612436.66**	**587670.71**	**7799.65**	**8077.65**	**8077.65**	**437.00**	**378.0**	**24765.95**

13.11 ISSUES RAISED DURING PUBLIC HEARING

Environmental Public Hearing was conducted by Telangana State Pollution Control Board on 10th August, 2021 simultaneously in six districts namely Mahabubnagar, Nagarkurnool, Rangareddy, Vikarabad, Nalgonda and Narayanpet Districts. The issues raised during each public hearing has been summarised in sub section 7.3.1 through 7.3.6 of this report. The gist of issues raised and the replies of the project proponent are described in Table 7.1 through Table 7.6 of the report. Nonetheless, the main issues raised in brief are brought out hereunder:

- Adequate amount of compensation.
- Compensation for land to be released at the earliest.
- Construction of small check dams, rainwater harvesting pits to increase the ground water level
- Promotion of solar energy in villages.
- Facility should be provided for fisheries development in the area.
- The cattle may be provided for development of Women Associations.
- Empowerment of Women.
- Plantation in the area specially along the canal.
- Facilities should be provided to farmers for drawing water from the borewells

Irrigation projects are primarily welfare projects of the state and *inter-alia* include such works like command area development which bring about overall development of project area. The projects are intended as social welfare measures for meeting ever-increasing demand in food and fibre production, due to spiral rise in population, along with opportunity for opening vista of employment in rural areas by harnessing the available water resources to the optimum. The irrigation works are neither profit making nor these are planned as revenue generating to the state exchequer. Due to provision under O.M. F.No.22-65/2017-IA.III, dated 30th September,2020, the provision related to fund allocation based on percentage of capital investment under OM dated May 01,2018 and OM dated 19.6.2018, are not attracted now.

As per provision under O.M. F.No.22-65/2017-IA.III, dated 30th September,2020, concerns raised during public hearing and which were committed for addressal by the project proponent, have been included under Local Area Development Plan (Section 10.19) by earmarking Rs 4400 lakhs.

13.12 PENALTY PROVISIONS FOR VIOLATION CASES

The MoEF&CC, New Delhi, vide OM dated 7th July ,2021, had issued detailed SOP for identification and handling of violation cases touching and arising under EIANotification,2006. As per para 12a(i) of the OM, in respect of new projects where operation has not commenced, the penalty shall be applicable @1% of the total cost incurred up to date of filing of application along with EIA/EMP report. Therefore, the amount on this count works out as Rs 212 crores. However, in view of proviso under sub para 12.2, the penalty amount shall be halved as the project proponent, at the time of submitting application for Prior EC for Stage-II works, had *suo moto* reported about the construction of impugned works under Stage-I. As a result, the penal amount shall be Rs 106.00 Crores. This amount shall be in addition to the liability for carrying out various remedial measures the cost of which has been based on damage assessment for environmental damages caused during period under violation.

13.13 ABSTRACT OF COST OF PLAN, PENAL AMOUNT & BANK GUARANTEE AMOUNT

The summary cost of Remediation Plan, Natural Resources and Community Resources Augmentation Plan is Rs 142.49 Crores and is provided in Table13.32. As per Para11 Step:3 B viii of the OM dated,7th July ,2021, the project proponent shall be required to submit bank guarantee of equivalent amount i.e., Rs 142.49 Crores with the CPCB subject to recommendation of quantum of such amount by MoEF&CC. The said bank guarantee shall be released after successful implementation of the Remediation Plan, Natural and Community Resource Augmentation Plan. Besides this the project proponent shall have to pay the penal amount of Rs 106.00 Crores.

Table 13.32: Abstract of Cost of Plan, Penal Amount &Bank Guarantee Amount

S.N.	Particular/Plan	Estimated Cost (Rs. Crore)
1	Remediation Plan	72.63
2	Natural Resources Augmentation Plan	29.06
3	Community Resources Augmentation Plan	40.80
Total		**142.49**
4	Equivalent Amount of Bank guarantee	142.49
5	Penalty as per para 12a(i) & 12.2 of the OM, dated7th July ,2021	106.00

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S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2	River Valley projects	3	1 (c)	A
3	Thermal power plants	4	1 (d)	B
4	Mineral beneficiation	7	2 (b)	B
5	Isolated storage & handling of Hazardous chemicals (As per threshold planning quantity indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	28	-	B
6	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones(SEZs), Biotech Parks, Leather Complexes	31	7 (c)	A
7	Ports, harbours, break waters and dredging	33	7 (e)	A
8	Highways	34	7 (f)	A
9	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
10	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
11	Building and construction projects	38	8 (a)	B
12	Townships and Area development projects	39	8(b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Nov 26, 2021 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/21/2195 dated Dec 30, 2021. The accreditation needs to be renewed before the expiry date by Voyants Solutions Pvt. Ltd, Gurugram following due process of assessment.

Sr. Director, NABET
Dated: Dec 30, 2021

Certificate No.
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Valid up to
Sept 14, 2024

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No.- J-12011/31/2017-IA-I (R)
Ministry of Environment, Forests and Climate Change
Government of India
[IA-I Division]

Indira Paryavaran Bhawan
3rd Floor, Vayu Wing
Jor Bagh Road
New Delhi-110003
Dated: 11th October 2017

To
Shri V. Lingaraju
Chief Engineer
Irrigation and CAD Department
Government of Telangana,
5th Floor, Jalasoudha Building, Erramanzil,
Hyderabad - 500082

Subject: **Palamaru Rangareddy Lift Irrigation Scheme in Mahbubnagar, Rangareddy & Nalgonda Districts of Telangana by Irrigation and CAD Department, Government of Telangana - TOR - regd.**

Sir,

This has reference to your letter No. CE/PRLIS/DCE/O.T-1/T.S1/2215 dated 28.8.2017 on the above-mentioned subject.

2. The above proposal was appraised by the Expert Appraisal Committee (EAC) for River Valley & Hydroelectric Power Projects (RV & HEP) in its 8th meeting held on 22.9.2017. The comments and observations of EAC may be seen in the Minutes of the meeting that are available on the Ministry's website.

3. It was noted that the scheme in its first phase envisages lifting of 90 TMC of flood water in 60 days during the flood season from the fore shore of the Srisailam reservoir on Krishna river at Yellur (V), Kollapur (M) in Mahabubnagar (D) through 5 separate stages to provide drinking water facilities to enroute 1428 villages in 74 mandals of Mahabubnagar, Rangareddy and Nalgonda Districts, Hyderabad City and also envisages to provide water for industrial use in Mahabubnagar, Rangareddy and Nalgonda Districts. The Cultural Command Area (CCA) is 4,97,976 ha. The total land requirement for the project is 15,790 ha. There is no displacement as no habitation is coming under submergence.

4. In 2nd phase, canal network will be developed from the reservoirs to create irrigation to up land areas of Mahabubnagar, Rangareddy and Nalgonda districts for an ayacut of 4.97,976 ha. Later on, this stored water shall be used for irrigation purposes in various districts through a network

of canals. In addition to the drinking water facility, it is proposed to irrigate in 4,97,976 ha of CCA in the districts of Mahabubnagar, Rangareddy and Nalgonda. A total of 15,790 ha land will be acquired for construction various canals network, reservoir, temporary labourers colonies, etc. No forestland is involved in the proposed project.

5. The proposed project is located at a distance of 11.95 km from the core of Amrabad Tiger Reserve, 2.56 km from the buffer and 1.56 from the proposed Eco-Sensitive Zone (ESZ) of Amrabad Tiger Reserve. The total cost of the project is about Rs. 35,200 Crores and likely to be completed in 30 months.

6. Based on recommendations of the EAC, the Ministry of Environment, Forest & Climate Change, hereby accords a fresh clearance for pre-construction activities at the proposed site as per the provisions of the Environmental Impact Assessment Notification, 2006 and subsequent amendment, 2009 along with the following Terms of Reference (ToR) for the preparation of EIA/ EMP report:

a) The EIA/EMP report should contain the information in accordance with provisions & stipulations as given in the **Annexure-I**.

b) The consultant engaged for preparation of EIA/EMP report has to be registered with Quality Council of India (QCI/ NABET under the scheme of Accreditation & Registration of MoEF. This is a pre-requisite.

c) Consultant shall include a "Certificate" in EIA/EMP report regarding portion of EIA/EMP prepared by them and data provided by other organisation(s)/ laboratories including status of approval of such laboratories.

d) The draft EIAA/EMP report prepared as per **Annexure-I** should be submitted to the State Pollution Control Board Committee concerned for conducting Public Consultation as per the provisions stipulated in EIA Notification of 2006. Public Hearing, which is a component of Public Consultation, shall be held district wise at the site or in its close proximity as prescribed in Appendix (IV) of EIA Notification, 2006. The draft EIA/EMP report is to be submitted to SPCB etc. sufficiently before the expiry of the ToR validity so that necessary amendments in EIA/EMP can be undertaken based on public hearing and the same is submitted to MoEF&CC before expiry of validity.

e) The PP has disclosed during the TOR presentation that Monsoon season data has been collected in 2017 for this project and requested the EAC to accept the same for use in the EIA/EMP report. The committee accepts that the Monsoon data collected can be included in the EIA/EMP report.

f) All issues discussed in the Public Hearing / Consultations should be addressed and incorporated in the EIA/EMP report. Final EIA/EMP report should be submitted to the Ministry for Environmental

Clearance only after incorporating these issues before the expiry of validity of ToR.

g) The ToR will remain valid for a period of 4 years from the date of issue of this letter for submission of EIA/EMP report along with public consultation. The ToR will stand lapsed on completion of 4 years in case final EIA/EMP is not submitted and the validity is not extended.

h) In case of any change in the scope of the project such as capacity enhancement, change in submergence, etc., fresh scoping clearance has to be obtained by the project proponent.

i) The PP should submit a copy of TEC of the DPR along with EIA/EMP report.

j) Information pertaining to Corporate Environmental Responsibility and Environmental Policy shall be provided in the EIA/EMP Report as per this Ministry's OM No. J-11013/25/2014-IA-I dated 11.08.2014 (Reference as **Annexure-II**)

k) The EIA/ EMP report must contain an Index showing details of compliance of all TOR conditions. the Index will comprise of page no. etc., vide which compliance of a specific ToR is available. It may be noted that without this index, EIA/ EMP report will not be accepted.

l) In case the validity is to be extended, necessary application is to be submitted to Regulatory Authority before expiry of validity period together with an updated Form-I based on proper justification.

This has approval of the Competent Authority.

Yours faithfully,

(Dr. S. Kerketta)

Director

Copy to:

1. The Secretary, Ministry of Water Resources, Shram Shakti Bhawan, Rafi Marg, New Delhi – 1.
2. The Principal Secretary (Irrigation), Government of Telangana, Secretariat, Hyderabad – 500 001.
3. The Secretary, Department of Environment & Forest, Government of Telangana, Secretariat Hyderabad – 500 022.
4. The Chief Engineer, Project Appraisal Directorate, Central Water Commission, Sewa Bhawan, R. K. Puram, New Delhi – 110 066.
5. The Addl. PCCF (C), Ministry of Environment, Forest and Climate Change, Regional Office (SEZ), 1st and 2nd Floor, Handloom Expert Promotion Council, 34, Cathedral Garden Road, Nungambakkam, Chennai – 600 034.

6. The Member Secretary, Telangana State Pollution Control Board, Paryavaran Bhawan, Industrial Estate, Sanath Nagar, Hyderabad.
7. Guard File.

(Dr. S. Kerketta)
Director

TERMS OF REFERENCE FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY FOR 'A' CATEGORY RIVER VALLEY PROJECTS AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT

(1) Scope of EIA Studies

The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analyzed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.

(2) Details of the Project and Site

- General introduction about the proposed project.
- Details of project and site giving L.-sections of all U/S and D/S projects of River with all_ relevant maps and figures. Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of diversion into the main river.
- A map of boundary of the project site giving details of protected areas in the vicinity of project location.
- Location details on a map of the project area with contours indicating main project features. The project layout shall be superimposed on a contour map of ground elevation showing main project features (viz, location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.
- Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least a 1:50,000 scale and printed at least on A3 scale for clarity.
- Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
- Drainage pattern and map of the river catchment up to the proposed project site.
- Delineation of critically degraded areas in the directly draining catchment on the basis of silt Yield Index as per the methodology of All India Soil and Land Use Survey of India.
- Soil characteristics and map of the project area.
- Geological and seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal site.
- Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color composite (FCC) generated front satellite data of project area.
- Land details including forests, private and other land.

- Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.

(3) Description of Environment and Baseline Data

To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socio-economic status etc. should be collected with 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline data should be collected for 3 seasons (Pre-Monsoon, Monsoon and Post Monsoon seasons). Flora/fauna in the catchment area and command area should be documented. The study area should comprise of the following:

- Catchment area up-to the darn site.
- Submergence Area
- Project area or the direct impact area should comprise of area falling within 10 km radius from periphery of reservoir, land coming under submergence and area downstream of dam

(4) Details of the Methodology

- The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included.
- Study area should be demarcated properly on the appropriate scale map.
- Sampling sites should be depicted on map for each parameter with proper legends.
- For forest classification, Champion and Seth (1968) classification should be followed.

(5) Methodology for collection of Biodiversity Data

- The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).

- The entire area should he divided in grids of 5km X 5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, clam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrats in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a

decimal number (i.e.it has an integral and a fractional part) which should he rounded to the next whole number.

- The conventional sampling is likely to miss the presence of rare, endangered and threatened (R.E.T.) species since they often occur in low densities and in case of faunal species are usually secretive in behavior. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must he referred to since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state *can* be referred to. Once a listing of possible R.E.T. species form the said area is developed, species specific methodologies should he adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need *be*, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of R.E.T. species should be provided in the EIA reports.

- The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1.972 and those listed in the red data books (BSI, ZSI and IUCN).

(6) <u>Components of the EIA Study</u>

Various aspects to be studied and provided in the EIA/EMP report are as follows:

A. Physical and Chemical Environment

(i) Geographical, Geological & Geophysical Aspects and Seismo-Tectonics:

- Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
- Tectonics, seismicitv and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National committee of Seismic Design Parameters, Central water commission, New Delhi. for large dams.
- Landslide zone or area prone to landslide existing in the study area should be examined.
- Presence of important economic mineral deposit, if any.
- Justification for location & execution of the project in relation to structural components (darn height).
- Impact of project on geological environment.

(ii) Meteorology, Air and Noise:

- Meteorology (viz. Temperature, Relative humidity, wind speed/ direction etc.) to be collected from nearest IMD station.

- Ambient Air Quality with parameters viz. suspended particulate matter (SPM), respirable suspended particulate matter (RSPM) i.e. suspended particulate matter <10 microns, sulphur dioxide (SO_2) and oxide of Nitrogen (NO_x) in the study area at 6 locations.
- Existing noise levels and traffic density in the study area at 6 locations.

(iii) Soil Characteristics

- Soil classification, physical parameters (viz., texture, porosity, bulk density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) (6 locations).

(iv) Remote sensing and GIS Studies

- Generation of thematic maps viz., slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
- New configuration map to be given in the EIA Report.

(v) Water Quality

- History of the ground water table fluctuation in the study area.
- Water quality for both surface water and ground water for (i) Physical parameters (pH, temperature, electrical conductivity, TSS); (ii) Chemical parameters (Alkalinity, Hardness, BOD, COD, NO2, PO4, Cl, SO4, Na, K, -Ca, Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameter (MPN, Total conform) and (iv) Heavy Metals (Pb, As, Fig, Cd, Cr-6, total Cr, Cu, Zn, Fe) (6 locations).
- Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS

B. Water Environment and Hydrology

- Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
- Run off, discharge, water availability for the project, etc.
- Basin characteristics.
- Catastrophic events like cloud bursts and flash floods, if any, should be documented.
- For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum 1 year actual silt flow rate to be expressed in ha-in km^2 year-1.
- Sedimentation data available with CWC may be used to find out the loss in storage over the years.
- Set-up G&D monitoring station in the catchment area for collecting data during the investigation.
- Flow series, 10 daily with 90%, 75%,and 50% dependable years discharges.

- A table of 10 daily water discharge in 75% dependable year showing the intercepted discharge at the barrage, diversion for irrigation, environmental and other flow releases downstream of the barrage shall be included in the EIA report.
- Environmental flow release would be 20% of average of four consecutive months of 90% dependable year in lean season, 25% in non-monsoon & non-lean season and 30% in monsoon to be followed corresponding to 90%dependable year. A site specific study on minimum environment flow should be carried out
- Hydrological studies/data as approved by CWC shall be utilized in the preparation of ETA/EMP report. Actual hydrological annual yield may also be given in the report.
- A minimum of 1 km distance from the tip of the reservoir to the tail race tunnel should be maintained between upstream and downstream projects.

C Biological Environment

Besides primary studies, review of secondary data/literature published for project area on flora & fauna including RET species shall be reported in EIA/EMP report

(i) Flora

- Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
- Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteriodophytes, Bryophytes (all groups). All species list should be provided.
- General vegetation profile and floral diversity covering all groups of flora including *lichens* and orchids. A species wise list may be provided.
- Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index (WI) , Shannon Weiner index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems.
- Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
- Economically important species like medicinal plants, timber, fuel wood etc.
- Details of endemic species found hi the project area.
- Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along-with economic significance. Species diversity curve for RET species should be given.
- Cropping pattern and Horticultural Practices in the study area.
- Biodiversity study shall be carried out by associating a reputed organization as per the list of such institutes is available on Moef & CC website.

(ii) Fauna:

- Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status along with Schedule of the species.
- Information (authenticated) on Avi-fauna and wildlife in the study area.
- Status of avifauna their resident/ migratory/ passage migrants etc.
- Documentation of butterflies, if any, found in the area.

- Details of endemic species found in the project area.
- RET species-voucher specimens should be collected along-with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
- Existence of barriers and corridors, if any, for wild animals.
- Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
- Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities components.

D Aquatic Ecology

- Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplantkton, benthos etc.
- Fish and fisheries, their migration and breeding grounds.
- Fish diversity composition and maximum. length & weight of the measured populations to be studies for estimation of environmental flow.
- Conservation status of aquatic fauna.
- Sampling for aquatic ecology and fisheries must be conducted during the 3 seasons – Pre-monsoon (summer), monsoon and winter. Sizes (length & weight) of important fish species need to be collected and breeding and feeding grounds should be identified along the project site or in vicinity.

E Socio-Economic

- Collection of baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety' and security of workers and surroundings population.
- Collection of information with respect to social awareness about the developmental activity in the area and social .welfare measures existing and proposed by project proponent.
- Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
- The socio-economic survey/ profile within 10 km of the study area for demographic profile; Economic Structure; Developmental Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.
- Documentation of demographic, Ethnographic, Economic Structure and development profile of the area.
- Information on Agricultural Practices, Cultural and aesthetic sites, Infrastructure facilities etc.
- Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
- List of all the Project Affected Families with their name, age, educational qualification, family size, sex, religion, caste, sources of income, land & house holdings, other properties, occupation, source of income., house/land to be acquired for the project and house/land left with the family, any other property, possession of cattle, type of house etc.
- In addition to socio-economic aspects of the study area, a separate chapter on socio-cultural aspects based upon study on Ethnography of the area should be provided.

(7) Impact Prediction and Mitigation Measures

The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described,

(i) Air Environment

- Changes in ambient and ground level concentrations due to total emissions from point, line and area sources.
- Effect on soil, material, vegetation and human health.
- Impact of emissions from DG set used for power during the construction, if any, on air environment.
- Pollution due to fuel combustion in equipment and vehicles
- Fugitive emissions from various source

(ii) Water Environment

- Changes in surface and ground water quality
- Steps to develop pisci-culture and recreational facilities
- Changes in hydraulic regime and downstream flow.
- Water pollution due to disposal of sewage
- Water pollution from labour colonies/ camps and washing equipment.

(iii) Land Environment

- Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
- Changes in land use / land cover and drainage pattern
- Immigration of labour population
- Quarrying operation and muck disposal
- Changes in land quality including effects of waste disposal
- River bank and their stability
- Impact clue to submergence.

(iv) Biological Environment

- Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
- Pressure on existing natural resources
- Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
- Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
- Impact on fish migration and habitat degradation due to decreased flow of water
- Impact on breeding and nesting grounds of animals and fish.

(v) Socio-economic aspects

- Impact on local community including demographic profile.
- Impact on socio-economic status
- Impact on economic status.
- Impact on human health due to water / vector borne disease

- Impact on increase traffic
- Impact on Holy Places and Tourism
- Impacts of blasting activity during project construction which generally destabilize the land mass and. leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.
- Positive and negative impacts likely to be accrued due to the project are listed.

(8) Environmental Management Plans

- **Catchment Area Treatment (CAT)** Plan should be prepared micro-watershed wise. Identification of free draining/ directly draining catchment based upon Remote Sensing and. Geographical Information System (GIS) methodology and Sediment Yield Index (SYI) method of SLUSOI coupled with ground survey. Areas or watersheds falling under 'very severe' and 'severe' erosion categories are required to be treated. Both biological as well as engineering measures should be proposed in consultation with State Forest Department. Year-wise schedule of work and monetary allocation should be provided. Mitigation measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be included.
- **Command Area Development (CAD) Plan** giving details of implementation schedule with a sample CAD plan.
- **Compensatory Afforestation** shall be prepared by the State Forest. Department in lieu of the forest land proposed to be diverted for construction of the project as per the Forest (Conservation) .Act, 1980. Choice of plants for afforestation should include native and RET species, if any.
- **Biodiversity and Wildlife Conservation and Management Plan** for the conservation and preservation of rare, endangered or endemic floral/ faunal species or some National Park/Sanctuary/ Biosphere Reserve or other protected area is going to get affected directly or indirectly by construction of the project, then suitable conservation measures should be prepared in consultation with the State Forest Department.
- **Resettlement and Rehabilitation** (R&R) **Plan** need to be prepared with consultation of the project affected families and the State Government: Detailed budgetary estimates are to be provided. Resettlements site should be identified. The plan will also incorporate community development strategies. *Land acquisition for the project whose land is to be acquired should be suitably compensated in accordance with the law of the land and prevailing guidelines. R&R Plan is to be formulated as per new Act, 2013 which came into force w.e.f. 1.1.2014.*
- **Green Belt Development Plan** along the periphery of the reservoir, approach roads around the colonies and other project components, local plant species must be suggested with physical and financial details. Local plant species suitable for greenbelt should be selected.
- **Fisheries Conservation and Management Plan** – Fish fauna inhabiting the affected stretch of river, a specific fisheries management plan should be prepared for river and reservoir. If any migratory fish species is getting affected then the migratory routes, time/season of upstream and downstream migration, spawning grounds etc will be discussed in details.

- **Reservoir Rim Treatment Plan** for stabilization of land slide/ land slip zones, if any, around the reservoir periphery is to be prepared based on detailed survey of geology of the reservoir rim area. Suitable engineering and biological measures for treatment of identified slip zones to be suggested with physical and financial schedule.
- **Muck Disposal Plan** suitable sites for dumping of excavated materials should be identified in consultation with State Pollution Control Board and State Forest Department. All muck disposal sites should be minimum 30 in away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L-section/cross section of muck disposal sites and approach roads should be given. The plan shall have physical and financial details of the measures proposed.
- **Plan for Restoration of quarry sites** and landscaping of colony areas, working areas, roads etc. Details of the coarse/fine aggregate/clay etc. required for construction of the project and the rock/clay quarries/river shoal sites identified for the project should be discussed along-with the engineering and Biological measures proposed for their restoration with physical and financial details.
- **Study of Design Earthquake Parameters**: A site specific study of earthquake parameters should be done. Results of the site specific earthquake design parameters should be approved by National Committee of Seismic Design Parameters, Central Water commission (NCSDP), New Delhi.
- **Dam Break Analysis and Disaster Management Plan** The outputs of dam break model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam Break scenario. The action plan will include Emergency Action and Management plan including measures like preventive action notification, warning procedure and action plan for co-ordination with various authorities.
- **Water, Air and Noise Management Plans** to be implemented during construction and post-construction periods.
- Mitigation measures due to blasting on the structures in the vicinity
- **Groundwater management plan**
- **Public Health Delivery Plan** including the provisions of drinking water supply for local community.
- **Sanitation and Solid waste management plan** for domestic waste from colonies and labour camps etc.
- **Local Area Development Plan** to be formulated in consultation with the Revenue Officials and. Village Pancahayats. Local skill development schemes should be given. Details of various activities undertaken along with its financial outlay should be provided.
- Environmental safeguards during construction activities including Road Construction.
- **Energy Conservation Measures**
- **Environmental Monitoring Programme** with physical & financial details covering all the aspects of EMP. A summary of cost e estimates for all the plans, cost of implementing all the Environmental Management Plans.

(9) In the EMP, please include a sample CAD plan for a distributary outlet command. Such plan is to show the alignment of irrigation and drainage channels. The components of the OFD works to be undertaken may be clearly mentioned along with a time schedule for their completion vis-&-vis the progress of irrigation development.

Additional TOR

i. The scheme in its first phase envisages lifting of 90 TMC of floodwater in 60 days during the flood season from the foreshore of the Srisailam project on Krishna river at Yellur village through five separate stages, ending at K.P. Laxmidevipally village. Therefore, water availability analysis at Yelluru village (point of drawl) during monsoon season is to be submitted to ascertain sufficiency of water available.
ii. As the area is on fluoride affected zone, therefore, provisions should also be made to recharge the groundwater through proposed reservoirs to dilute fluoride levels.
iii. Groundwater be treated for removal of fluoride and then the treated water be supplied to the villagers for drinking purposes.
iv. Provision of e-flow should be ensured for the sustenance of aquatic life in the downstream river.
v. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines.
vi. Though, total power requirement has been provided, but its firm linkage is to be supported with documents.
vii. Proof of application for diversion of forestland for non-forest purpose will be submitted to the Ministry within one month, if any.
viii. Information on species composition in particular to fish species from any previous study/literature should be included.
ix. The clearance from Standing Committee of NBWL under the Wildlife (Protection) Act, 1972 should be obtained, as applicable.
x. Wildlife Conservation plan be prepared for the area located within the project and implemented by the project proponent in consultation with the State Forest Department. Wildlife Conservation plan also to be prepared for the impacted area due to construction of the project falling outside the project area and implemented by the local state Forest Department.
xi. Solid waste management should be planned in details. Land filling of plastic waste shall be avoided and instead proposal for various uses may be proposed in the revised EIA/EMP report.
xii. Resettlement & Rehabilitation Plan should be implemented as per the prevail guidelines of the Govt. of India ,
xiii. Skill mapping be undertaken for the youths of the affected project area and based on the skill mapping, necessary trainings to the youths be provided for their appropriate engagements in the Project

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Annexure -II

No.J-11013/25/2014-IA.I
Government of India
Ministry of Environment & Forests

Indira ParyavaranBhawan,
JorBagh Road, Ali Ganj,
New Delhi-11003

Dated the 11th August, 2014

OFFICE MEMORANDUM

Subject: Environment sustainability and CSR related issues-guidelines

The Environment Impact Assessment (EIA) Notification 2006, issued under the Environment (Protection) Act 1986, as amended from time to time, prescribes the process for granting prior environment clearance (EC) in respect of certain development projects / activities listed out in the Schedule to the notification.

2. Sustainable development has three components, viz., social, economic and environmental. All the three components are closely inter-related and mutually re-enforcing. Considering this, the general structure of EIA document, under Appendix-III to the notification, prescribes inter-alia public consultation, social impact assessment and R&R action plan besides environment management plan (EMP).

3. It is noticed that while there is clarity on the guidelines on EMP, as regards sustainability related issues, different formulations have been prescribed in the conditions in EC letters for the projects under different sectors listed out in Schedule to the EIA Notification, 2006. Thus, there is a need to issue guidelines on the subject.

4. Section 135 of the Companies Act, 2013 deals with corporate social responsibility and Schedule-VII of the Act lists out the activities which may be included by companies in their CSR Policies. The activities relating to "ensuring environmental sustainability", are listed in this schedule. Further, Ministry of Corporate Affairs has also notified the Companies (Corporate Social Responsibility Policy) Rules, 2014.

5. The concept of CSR as provided for in the Companies Act, 2013 and covered under the Companies (Corporate Social Responsibility Policy) Rules, 2014 comes into effect only in case of companies having operating projects and making net profit as also subject to other stipulations contained in the aforesaid Act and Rules. The environment clearance given to a project may involve a situation where the concerned company is yet to make any net profit and / or is not covered under the purview of the aforesaid Act and Rules. Obviously, in such cases, the provisions of aforesaid Act and Rules will not apply.

6. The matter has been further examined in the Ministry of Environment Forests & Climate Change (MoEF&CC). It has been decided that in respect of valid concerns expressed during the public consultations, mitigation issues emerging from social impact assessment and R&R Plan, the project proponents, in EIA / EMP report will clearly state the activity-wise cost involved (both capital as well as recurring costs), the phasing of these activities along with costs and also as to how such expenditure would be met. The costs and the timelines for various activities as prepared by the project proponent may be looked into by the concerned Expert Appraisal Committee (EAC) for their reasonableness and appropriate recommendations in the matter reflected in the minutes of EAC meeting. In case these activities (or some of these activities) are proposed to be covered by the project proponent under CSR activities, the project proponent should commit providing for the same. In either case, the position regarding the agreed activities, their funding mechanism and the phasing should be clearly reflected in the EC letter.

7. The obligation on part of the project proponents, as mentioned in para5 above, should be stated at the TOR stage itself as one of the TORs for the project.

8. All Sectoral EACs will follow the aforesaid procedure on environment sustainability and CSR related issues while appraising the projects and do away with the existing practices being followed on the subject, if any.

9. These guidelines will apply mutatis mutandis to SEACs/SEIAAs.

10. This issues with the approval of the Component Authority.

(Dr. Satish C.Garkoti)
Scientist 'F'

To

1. All the Officers of IA Division
2. Chairpersons / Member Secretaries of all the SEIAAs / SEACs
3. Chairman, CPCB
4. Chairpersons / Member Secretaries of all SPCBs / UTPCCs

Copy to:

1. PS to MEF
2. PPS to Secretary (EF&CC)
3. PPS to AS(SS)
4. PPS to JS(AT)
5. Website of MoEF&CC
6. Guard File

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

VISON LABS

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

16-11-23/37/A, FLAT NO. 205, 2ND FLOOR, MOOSARAMBAGH, MALAKPET, HYDERABAD, TELANGANA, INDIA

in the field of

TESTING

Certificate Number: TC-5064

Issue Date: 26/11/2021 **Valid Until:** 25/11/2023

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : Vison Labs

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

Item No.16:

BEFORE THE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI

Original Application No. 147 of 2021 (SZ) &
I.A. No.113 of 2021 (SZ)
(Through Video Conference)

IN THE MATTER OF:

Kosgi Venkataiah
S/o. Kosgi Balaiah
R/o H.No.2-57, Mudireddy Pally Village,
Rajapur Mandal, Mahabub Nagar District
Telangana – 509 2020.

...Applicant(s)

Versus

Union of India
Rep. by its Secretary,
Ministry of Environment, Forest & Climate Change,
Indira Priyadharshini Bhavan
Jorbagh, New Delhi – 110 003 and Ors.

...Respondent(s)

Date of hearing: 27.08.2021.

CORAM:

HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER

HON'BLE MR. Dr. K. SATYAGOPAL, EXPERT MEMBER

For Applicant(s): Mr. Sravan Kumar.

For Respondent(s): Mr. G.M. Syed Nurullah Sheriff for R1.
Mr. Sanjeev Kumar, Spl. Govt. Pleader along with
Mrs. H. Yasmeen Ali for R2 to R5.
Mr. Sriram, Adv. General along with
Mrs. Madhuri Donti Reddy (I.A. 113/2021)
Mrs. Revathi Manivanan for CPCB.
Mr. D. Ramesh Kumar for KRMB.

ORDER

1. The above case has been posted to today for appearance of parties and also for consideration of report.

2. This interlocutory application [I.A.No.113/2021 (SZ) in O.A. No.147/2021(SZ)] was filed by the State of Andhra Pradesh to get themselves impleaded in the proceeding as additional 6th respondent, as they are also interested in the project as it is likely to affect their interest.

3. Heard both sides.

4. On going through the allegations made in the interlocutory application, we are satisfied that the interest of the State of Andhra Pradesh is also involved in the disputed project, as it related to sharing of water between two States which is always under dispute before the various forums.

5. So under such circumstances, we feel that it is necessary to implead them also in the proceedings as additional respondent. So, **I.A. No.113/2021 (SZ) is allowed** and the applicant in I.A. No.113/2021 (SZ) namely, the State of Andhra Pradesh is impleaded as additional 6th respondent in the main application.

6. The Registry is directed to carry out the amendment in the cause title and the applicant is directed to produce the amended copy of the application.

7. The respondents 2 to 5 have filed their reply statement.

8. Though the Joint Committee was appointed, they have not filed any report so far.

9. The learned Advocate General appearing for the State of Andhra Pradesh submitted that in spite of the fact that there is urgency in the matter, the committee has not even inspected and submitted any report before this Tribunal. Further, the committee has been directed to consider the question involved in O.A. No.148/2021 (SZ) also, which is also more or less similar to the same issue.

10. So under such circumstances, it is better not to involve the State authorities or the persons who have been appointed as the nodal agency, as they are showing lethargic attitude in co-ordinating the meeting and conducting inspection. So, we feel that it is necessary to make some change in combination of the committee and since it involves the water sharing dispute between the State of Telangana and State of Andhra Pradesh and such matter are being considered by the Krishna River Management Board, we feel it appropriate to include a Senior Officer from the Krishna River Management Board also as one of the members of the committee and instead of Mining and Geology

Department, State of Telangana/ Nodal agency, Krishna River Management Board can be designated as the nodal agency, so that they can co-ordinate and make the inspection at the earliest possible time.

11. Mr. D. Ramesh Kumar represented Krishna River Management Board and submitted that he will give necessary instruction to his client in this regard.

12. If the State Departments did not co-operate to expedite the inspection, other members of the committee can proceed with the inspection and submit an interim report before this Tribunal regarding the nature of things that are being done in that area.

13. The modified committee is directed to submit the report to this Tribunal on or before 22.09.2021 by e-filing in the form of Searchable PDF/OCR Supportable PDF and not in the form of Image PDF along with necessary hardcopies to be produced as per Rules.

14. In the meantime, the additional 6th respondent/State of Andhra Pradesh is also directed to file their reply statement (if any) before the next hearing by serving copy to the other side, so that, they can file their rejoinder (if any) to the same without further delay.

15. The Registry is directed to communicate this order to the members of the modified committee and also to the official respondents by e-mail immediately so as to enable them to comply with the direction.

16. For completion of pleadings and also for consideration of report, post on 22.09.2021.

Sd/-
.....J.M.
(Justice K. Ramakrishnan)

Sd/-
.....E.M.
(Dr. K. Satyagopal)

O.A. No.147/2021 (SZ) &
I.A. No.113/2021 (SZ),
27th August, 2021. Mn.

Item No.17:

BEFORE THE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI

Original Application No. 148 of 2021 (SZ)

(Through Video Conference)

IN THE MATTER OF:

D. Chandramouleswara Reddy,
Age 63 years
S/o. D. Shankar Reddy
H.No. S-1-321
Singapore Township, Puttampalli,
YSR Kadappa District, Andhra Pradesh and Ors.

…Applicant(s)

Versus

Union of India
Represented by its Secretary,
Ministry of Jal Shakti,
Shram Shakti Bhavan,
New Delhi and Ors.

…Respondent(s)

For Applicant(s): Mr. P.S. Raman, Senior Advocate along with
Mr. Gautam S. Raman.

For Respondent(s): Mr. D. Ramesh Kumar for R1 & R4.
Mr. G.M. Syed Nurullah Sheriff for R2 & R3.
Mr. Sanjeev Kumar, Spl. Govt. Pleader
along with Mrs. H. Yasmeen Ali for R5.
Mr. S. Sriram, Adv. General along with
Mrs. Madhuri Donti Reddy for R6.
Mrs. Revathi Manivanan for CPCB.

Date of hearing: 27.08.2021.

CORAM:

HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER
HON'BLE DR. K. SATYAGOPAL, EXPERT MEMBER

ORDER

1. The above case has been posted to today for appearance of parties, filing independent response and also for consideration of report.
2. The 5th respondent has filed their reply affidavit. The 6th respondent had already filed their reply affidavit.
3. This Tribunal had directed the committee appointed in O.A. No.147 of 2021 (SZ) to inspect and submit a report in this case as well. We have made some modification in the constitution of committee by including a Senior Officer from the Krishna River Management Board as well, as one of the committee member and designated them as a nodal agency instead of Mining and Geology Department, State of Telangana, while considering O.A. No.147/2021 (SZ) today.
4. The members of committee must understand the seriousness of the issue and have a proactive attitude in conducting the inspection and submitting the report on time. Any delay in submitting the report will only cause destruction of possible evidence that is necessary for consideration before this Tribunal.

5. The State of Telangana is also directed to explain the actual quantity of water required for drinking purpose in the area which is likely to be benefited by the earlier drinking water project, as now in the reply statement they have stated that they require 90 TMC of water for drinking water purpose and industrial use and whether they are using the earlier drinking water project for supplying water for industrial purpose as well.
6. The modified committee is directed to submit the report to this Tribunal on or before 22.09.2021 by e-filing in the form of Searchable PDF/OCR Supportable PDF and not in the form of Image PDF along with necessary hardcopies to be produced as per Rules.
7. The Registry is directed to communicate this order to the members of the modified committee and also to the official respondents by e-mail immediately so as to enable them to comply with the direction.
8. For completion of pleadings and submission of report, post on 22.09.2021.

Sd/-
.....J.M.
(Justice K. Ramakrishnan)

Sd/-
.....E.M.
(Dr. K. Satyagopal)

O.A. No.148/2021
27th August, 2021. Mn.

GOVERNMENT OF TELANGANA
FOREST DEPARTMENT

From:
Smt. R.Sobha, I.F.S.,
Prl. Chief Conservator of Forests (HoFF) &
Chief Wildlife Warden
Aranya Bhavan
Saifabad, Hyderabad

To:
The Chief Engineer
Irrigation,
Nagarkurnool.

Rc.No. 8025/2017/WL-1, dt: 01.09.2021.

Sir,

Sub:- TSFD – WL – Wildlife Conservation Plan for Schedule-I Wildlife Species found in the Study Area for Palamuru Rangareddy Lift Irrigation Scheme in the State of Telangana – Revised Wildlife Conservation Plan – Approval Communicated - Regarding.

Ref:- 1. Chief Engineer, Irrigation, Nagarkurnool Lr.No.CE/Irr/Ngkl/OT1/TS1/ Wildlife/FAC/985, dt:28.08.2021.
2. CCF/Field Director, Amarabad Tiger Reserve Rc.No.2324/PT 4/2021, dt.01.09.2021.

*****

This is to inform that, in the above reference 1st cited, the Chief Engineer, Irrigation, Nagarkurnool has stated that a Wildlife Conservation Plan on Schedule-I species has been prepared by the User Agency for taking up Palamuru Rangareddy Lift Irrigation Scheme in accordance with the EIA notification, 2006 and the amendments thereafter. This office was requested to approve the said Wildlife Conservation Plan.

On verification of the Wildlife Conservation Plan submitted by the User Agency, it is noticed that the Conservation Plan is prepared for the three Schedule-I Species found in the study area i.e., Indian Wolf, Leopard and Peafowl, to be implemented over a period of 10 years with a total cost of Rs.80.00 lakh. This Wildlife Conservation Plan was forwarded to the Chief Conservator of Forests/Field Director, Amarabad Tiger Reserve for scrutiny and remarks.

The CCF/FD, ATR in 2nd reference furnished a revised Wildlife Conservation Plan for the study area of 10.00 km around the proposed project. In his report the FD, KTR has stated that the area has several Schedule-I species listed in Wildlife (Protection) Act, 1972, the important ones being Tiger, Panther, Marsh Crocodile, Indian Wolf, Vulture, Smooth coated Otter, Black Buck etc. It was also stated that the Conservation Plan prepared by User Agency has proposed only Rs.80.00 lakh for Conservation of Schedule-I species to be spent over a period of 10 years. The FD, KTR stated that this amount is not sufficient to protect and conserve the schedule-I species in the study area and has revised the Conservation Plan to be implemented over a period of 5 years, at a cost of Rs.539.00 lakh. Several operations/activities which are required, but not included in the Conservation Plan prepared by the User Agency, have been included in the revised Plan by the FD, KTR. The Field Director further stated that the Plan has been revised based on the Conservation status of the schedule-I species in the area, the need for

improving the habitat of these species, the aspect of strengthening protection, mitigating man-animal conflict, building up awareness, education and publicity, research & monitoring etc.

The abstract of revised Wildlife Conservation Plan showing the details of activities and budget required for year I to year V is given in table 5.1 and the year wise budget proposed is given in table 5.2.

The revised Plan prepared by Chief Conservator of Forests/FDPT, ATR is approved for Rs.539.00 lakh and enclosed herewith for incorporation in the Wildlife Conservation Plan prepared by the Irrigation Department as per the EIA notification, 2006.

Encl:- as above.

Yours faithfully,
Sd/- R. Sobha,
Prl. Chief Conservator of Forests (HoFF)
& Chief Wildlife Warden

Copy to the CCF/FDPT, KTR for information and necessary action.

//True copy//

for Prl. Chief Conservator of Forests

WILDLIFE CONSERVATION PLAN FOR SCHEDULE I FAUNAL SPECIES OF THE STUDY AREA FOR THE PROPOSED PALAMURU RANGAREDDY LIFT IRRIGATION, TELANGANA

(ToR Letter:J-12011/31/2017-IA-I (R) dated 11th October, 2017)

(Project Location: Mahbubnagar, Nagarkarnool, Nalagonda, Rangareddy, Vikrabad and Narayanpet Districts of Telangana)

River Valley Project 1(C2)

Category of Project: A

Lift Irrigation Project

Applicant

IRRIGATION & CAD DEPARTMENT, GOVT. OF TELANGANA

ENVIRONMENT CONSULTANT

Voyants Solutions Pvt. Ltd., Gurugram

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Project Narrative:	The Project aims to supply clean potable water (Phase-I) to about 1226 villages in 70 mandals of the upland and water scare areas of six drought prone districts i.e. Mahbubnagar, Nagarkarnool, Nalagonda, Rangareddy, Vikrabad and Narayanpet by utilizing excess flood water (90 TMC) in about 60 days during the flood season from the fore shore of the Srisailam Reservoir Project on Krishna River located at Yellur (V), Kollapur (M) in Nagarkarnool district to Padmaram (V), Chowdergudem (M) in Rangareddy district. Under Phase-II, the eventual plan is to use this water for irrigation in various districts through a network of canals. The Palamauru-Rangareddy Lift Irrigation Scheme is intended to irrigate upland areas of Mahbubnagar, Nagarkarnool, Nalagonda, Rangareddy, Vikrabad and Narayanpet district for a command area of 497,976 ha. (12.30 lakh acres) and provide water for domestic and industrial use.
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1 INTRODUCTION AND PROJECT BACKGROUND

1.1 BACKGROUND

Telangana lies between 15° 46' and 19° 47' N latitude and 77° 16' and 81° 43' E longitude and is bordered by Maharashtra in north and north-west, Karnataka towards the west, Chhattisgarh in north-east and Andhra Pradesh in south and east.

Situated in the southern part of India, Telangana is the 29th state of India, formed on 2nd June 2014 with 1,12,077 Sq. km. of area and has a population of over 35 million. Forests occupy 24% of area, and about 43% of land is under cultivation. Ground water contributes to 75% of irrigation, while remaining using surface water. According to the agro-climatic zones, this region falls under the southern plateau and hills regions and is classified as hot semi-arid ecoregion with red and black soils as per the agro-ecological zones. As such, the climate is predominantly hot and dry. The annual average rainfall is about 906 mm, 80% of which is received from south-west monsoon.

Drainage of the state can be divided into 2 major and 11 sub-basins and over 60% of soils can be classified as red in colour. Godavari and Krishna are major rivers in the state, with around 73.5% of state's territory being covered by basin of these two rivers.

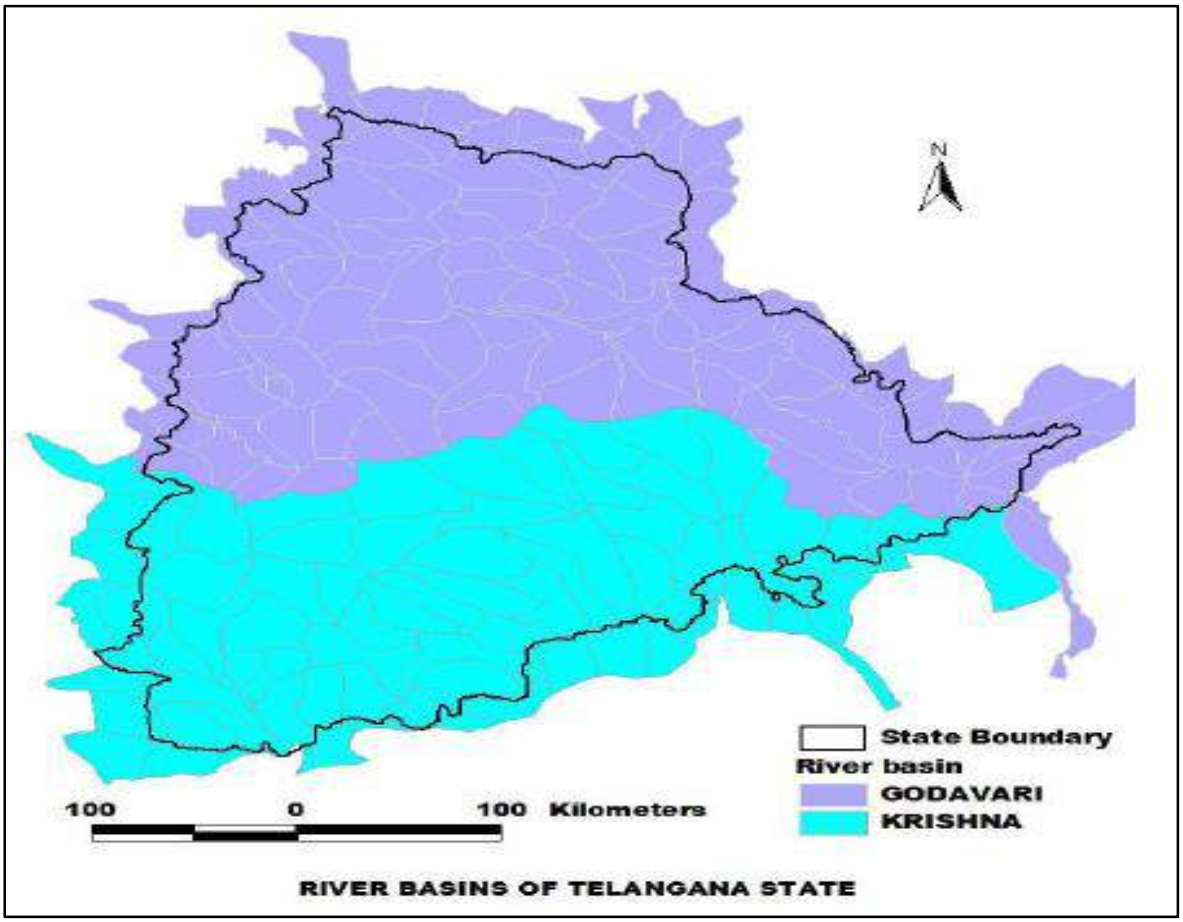


Figure 1-1: River basins of Telangana State

Analysis of last 30 years data on drought indicates the districts of erstwhile Andhra Pradesh which after reorganisation of state are now covered in Telangana state has experienced 23 years as droughts affected in some or other mandals. Further, non-availability of sufficient irrigation facilities and limitations w.r.t. ground water exploration makes Telangana State drought prone. The agricultural statistics for 2015-16 indicate that Nalgonda, Mahabubnagar, Rangareddy and Medak districts are susceptible to droughts in Telangana. Being a new state, the government is making every effort for optimal use of available water resources for agriculture, industrial sector as well as providing drinking water for overall development.

Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) is one of the foremost and largest welfare projects being under taken by the Government of Telangana to supply clean potable water to the upland and water scarce areas of five draught prone districts (Mahabubnagar, Nagarkurnool, Rangareddy, Vikarabad and Nalgonda) by utilizing excess flood water(90TMC) in about 60 days during the flood season from the fore shore of the Srisailam Reservoir project on Krishna river at Yellur (V), Kollapur(M) in Nagarkurnool (D) through five separate stages, ending at Padmaram (V), Chowdergudem (M), near Shadnagar town in Rangareddy district at the highest elevation.These five stages each comprise of a reservoir and conduit between each reservoir for taking the water forward with pump houses being constructed where necessary. One of the main purposes of this project is to provide water for drinking water to command and enroute villages and industrial purposes. The main plan is to use this water for irrigation in these 5 districts through a network of canals. Water will then be drawn from selected reservoirs through a separate canal and pipeline distribution network.

In view of drought situation in the benefiting area and problems of high fluoride content in the groundwater in 5 districts, the lift irrigation project was planned to be executed in two phases: Phase-I (Water Supply) and Phase-II (Irrigation). The entire scheme was planned with 6 balancing reservoirs from which water shall be lifted in 5 stages.

The scheme in its first phase envisages lifting of 90 TMC of flood water in 60 days during flood season from the fore shore of existing Srisailam project on Krishna River at Yellur (V), Kollapur (M) in Mahabubnagar (D) through five separate stages, ending at Padmaram (V), Chowdergudem (M), near Shadnagar town at the highest elevation. These five stages comprise of a reservoir and conduit between each reservoir for taking water forward with pumphouses being constructed where necessary.

Phase-I (Water Supply): The purpose for the project is to provide water for drinking and industrial purposes to enroute villages and Hyderabad city. Therefore, the first phase of Palamuru-Ranga Reddy Lift Irrigation Scheme envisages to provide drinking water facilities to enroute 1226 villages in 70 mandals of Mahabubnagar, Rangareddy, Nagarkurnool, Vikarabad and Nalgonda Districts, Hyderabad City and water to industrial use in Mahabubnagar, Rangareddy and Nalgonda Districts by constructing series of approach channels, open canals, tunnels, pump houses and reservoirs by lifting 90 TMC of flood water in 60 days during flood season (1.50 TMC per day) from foreshore of Srisailam reservoir located at Yellur (V), Kollapur (M) in Nagarkurnool district to Padmaram (V), Chowdergudem (M), in Rangareddy district which is the highest elevation in Mahabubnagar and Rangareddy districts with 5 stage lifting and then utilizing water by gravity.

Under Phase-II, the eventual plan is to use this water for irrigation in various districts through a network of canals. In second phase, canal network will be developed from the reservoirs to create irrigation to

upland areas of Mahabubnagar, Nagarkurnool, Rangareddy, Vikarabad and Nalgonda districts for a command of 4,97,976 Ha. Under the project it is proposed to lift 90 TMC of flood water in 60 days during flood season (@ 1.50 TMC per day) from foreshore of Srisailam reservoir located at Yellur (V), Kollapur (M) in Nagarkurnool district to Padmaram (V), Chowdharigudem (M) Rangareddy District which is the highest elevation in Mahabubnagar and Rangareddy districts with 5 stages lifting and then utilizing water by gravity.

Thus, Palamuru - Rangareddy Lift Irrigation Scheme is intended to irrigate upland areas of Mahabubnagar, Rangareddy, Vikarabad, Nagarkurnool and Nalgonda districts for a command area of 4,97,976 ha (12.30 lakh acres) and provide water for domestic and industrial use. It's envisaged that the proposed project will benefit 1226villages at an estimated cost of Rs.52,056.31 Crores and is likely to be completed within 30 months' time frame. The total length of the canal network is 915.47km.

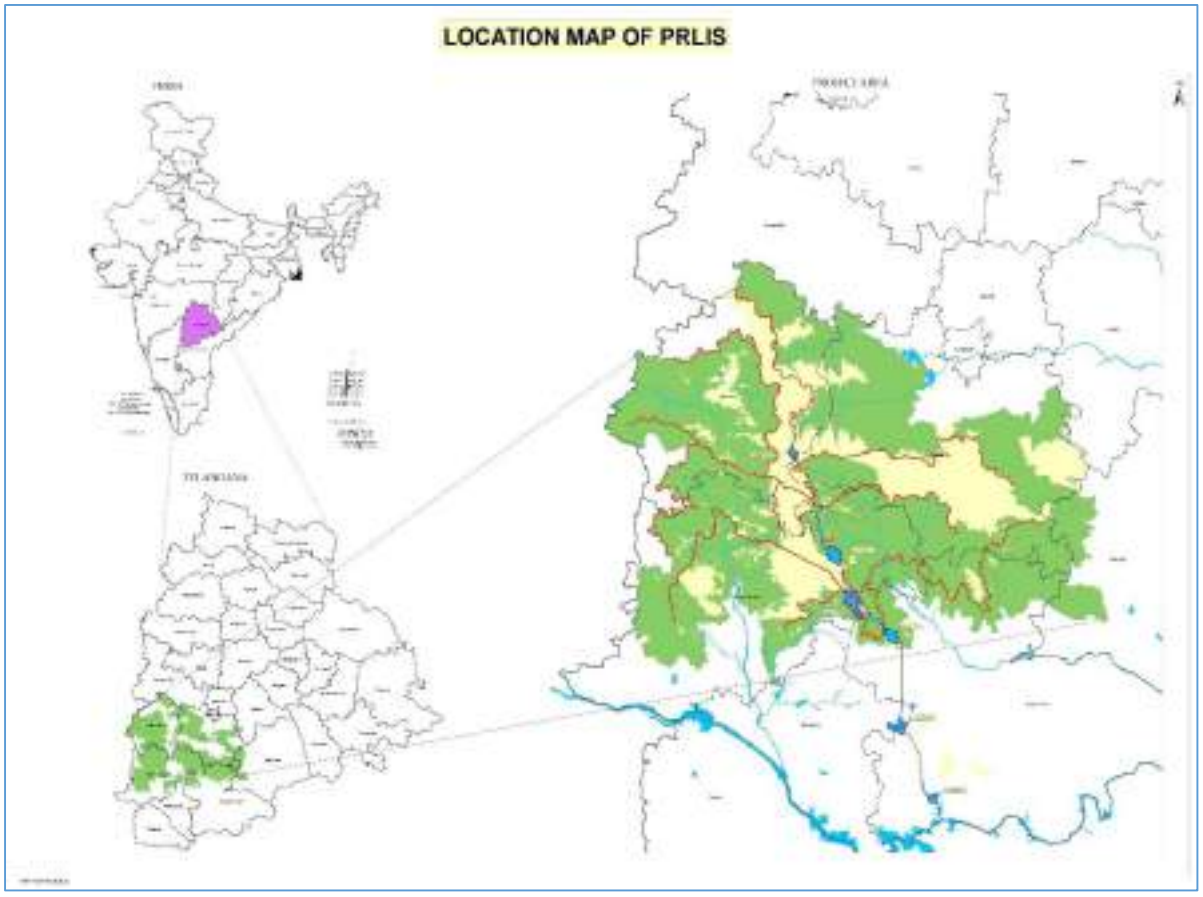
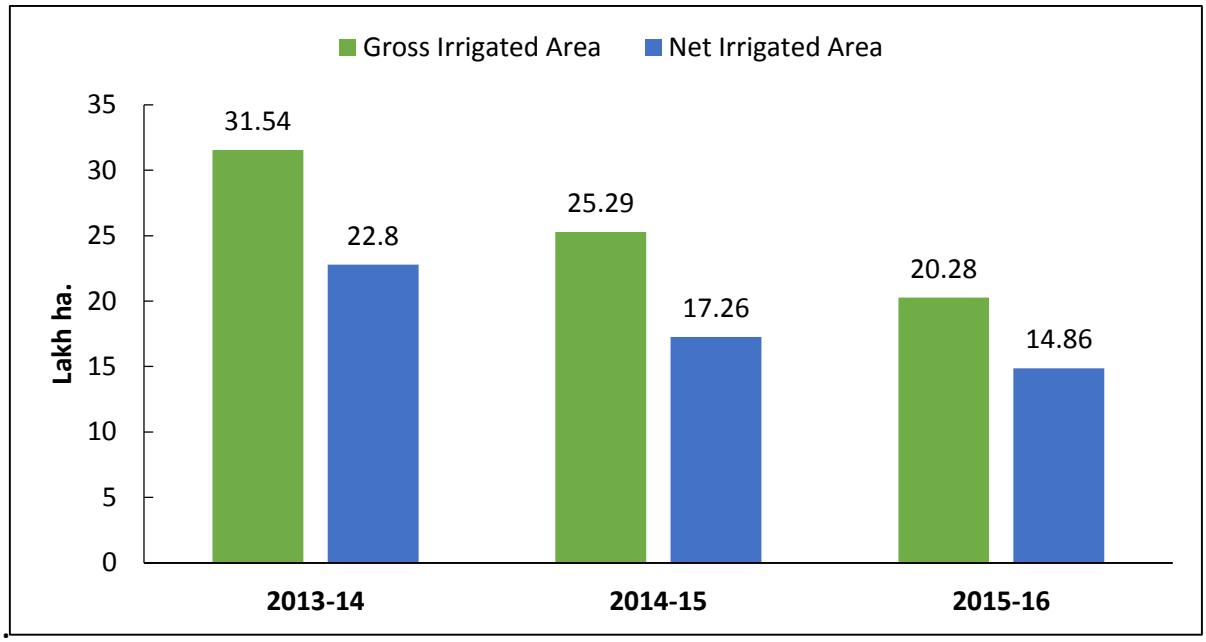


Figure 1-2: Location Map

1.2 JUSTIFICATION OF THE PROJECT

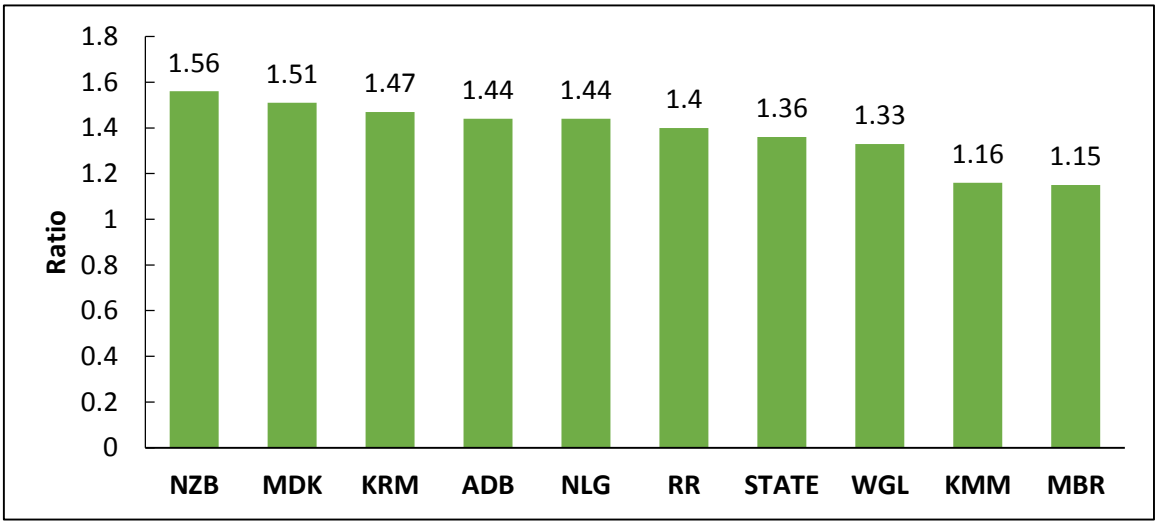
The economy of Telangana State is mainly agriculture based with over 61% of population residing in rural settings. As such, the economy is predominantly agrarian and is an important contributor to state GDP. The major sources of irrigation in the state are canals, tanks, tube wells, dug wells etc., and irrigation is being done with the use of various techniques such as surface irrigation, localized irrigation, drip irrigation, sprinkler irrigation, sub-irrigation depending upon the availability of source, accessibility and others to increase the productivity of the crop grown.

The gross cropped area stands at 62.88 lakh ha, while the net irrigated area is 22.89 lakh ha. The gross area irrigated in the State during 2015-16 has decreased to 20.28 lakh ha from 25.29 lakh ha in 2014-15, showing a decrease of 19.81%. Similarly, the net area irrigated has also decreased to 14.86 lakh ha in 2015-16 from 17.26 lakh ha in 2014-15 showing a decrease of 13.90%. Graphical representation of Gross and Net areas irrigated during 2013-14 to 2015-16 along with the irrigation intensity for 2015-16 is depicted in **Figure 1.3** & **Figure 1.4**.



**Source: SYB-GoT, 2017*

Figure 1-3: Gross and net irrigated area (2013-2016)

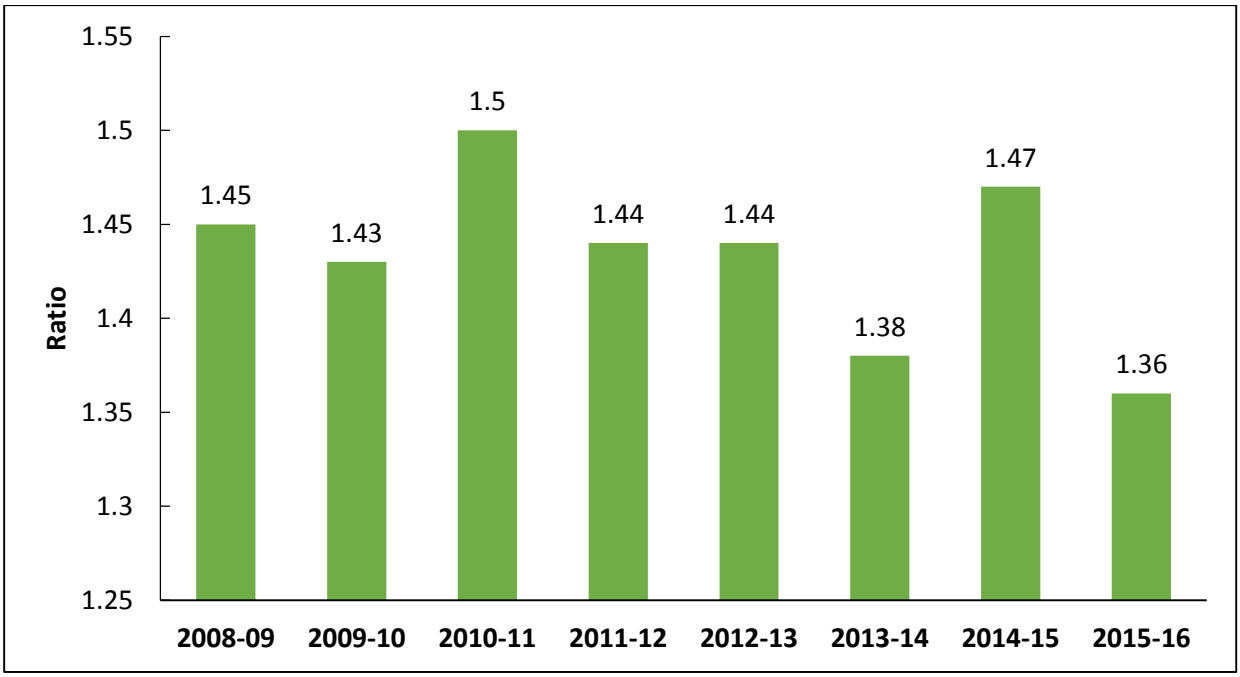


**Source: SYB-GoT, 2017*

Figure 1-4: District wise irrigation intensity in Telangana (2015-16)

The decadal irrigation intensities in the state of Telangana further indicate it's vital to augment the irrigation infrastructure (Figure 1-4). The source wise gross and net irrigated area presented in **Table 1.1**

Table 1-1also indicated a declining trend in gross as well as net irrigated area.



**Source: SYB-GoT, 2017*

Figure 1-5: Yearly irrigation intensities

Table 1-1: Source wise gross irrigated area (Lakh ha.)

Year	Tanks		Canals		Well (Tube & Dug)		Other sources	
	Gross Area	Net Area	Gross Area	Net Area	Gross Area	Net Area	Gross Area	Net Area
2008-09	2.86	2.38	3.74	2.74	19.80	13.10	0.80	0.61
2009-10	0.67	0.57	1.69	1.37	18.42	12.59	0.53	0.39
2010-11	3.05	2.38	5.04	3.16	21.11	13.96	0.79	0.55
2011-12	2.08	1.83	4.32	3.25	21.57	14.23	0.68	0.53
2012-13	1.79	1.58	1.21	0.90	22.07	14.86	0.50	0.40
2013-14	2.81	2.28	4.69	2.89	23.34	17.11	0.70	0.52
2014-15	1.13	0.97	2.43	1.74	21.16	14.13	0.57	0.43
2015-16	1.21	1.13	0.61	0.53	18.06	12.88	0.40	0.33

**Source: DES-GoT, 2016.*

Based on the above statistics, it's inevitable to increase the net irrigated area in order to meet the ever-increasing food demand, generate rural employment and reduce overall poverty in the region. This is also important considering its linkages in development with others sectors.

The Irrigation and Command Area Development (I&CAD) has been therefore mandated for planned utilization of 961.60 TMC and 298.96TMC of water in Godavari and Krishna basins, apart from flood waters in Krishna basin considering its irrigation potential.

The newly re-organized districts Mahabubnagar, Nagarkurnool, Rangareddy, Vikarabad and Nalgonda of Telangana State are the one of the drought prone and distressed areas in country. Further, there is significant shortage of drinking water; as a result, a large part of the population of these districts is being forced to migrate to other parts of the country. The situation is further compounded due presence of

fluoride in water. In order to redress this situation, the Government of Telangana has taken up the Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) for alleviating the misery of these drought prone areas. The Net irrigated Area is 23.8% of Net Cropped Area in Mahabbubnagar district and it is only 13.2%, 24.4%, 24.2% and 18.1% respectively in Nagarkurnool, Nalgonda, Rangareddy and Vikarabad districts.

GoT has taken up the ambitious task to irrigate drought prone areas of Mahabubnagar, Rangareddy and Nalgonda districts and provide potable drinking water and augment irrigation infrastructure in the region through Palamuru Rangareddy Lift Irrigation Scheme, hereafter referred as PRLIS.

1.3 ACCESSIBILITY

The main canal network is approachable by road from the nearest towns. The nearest railway station is "Jadcherla" at a distance of 23 km. The nearest airport is Hyderabad at a distance of 93 km. Mahabubnagar is the District Head quarter, Jadcherla, Kalwakurthi, Narayanpet, Bhutpur, Devarakadra, Kodangal, Shadnagar in Mahabubnagar District & Gandeed, Tandur, Dharur, chevella, vikarabad and Pargi of Rangareddy district are the major towns located in the project area. The Secunderabad - Bangalore Railway line of SC Railway and Hyderabad - Bangalore NH-44 and SH-4 & SH-21 pass through the mid region of the project area and serve as important means of commuting. The main canals take off from different reservoirs whose accessibility is presented in **Table 1.2.**

Table 1-2: Project components and its accessibility

Project Component	Roads	Railway	Airport
Lift-1			
Pump House at Narlapur Village, Kollapur Mandal, Nagarkurnool District	45 Km. from NH-44	62 km from Gadwal Railway station	160 Km. from Shamshabad Airport at Hyderabad
Anjanagiri Reservoir at Narlapur Village, Kollapur Mandal, Nagarkurnool District	42 Km. from NH-44	62 Km. from Gadwal Railway Station	160 Km. from Shamshabad Airport at Hyderabad
Lift-2			
Pump House at Teegalapalli Village, Kodair Mandal, Nagarkurnool District	37 Km. from NH-44	93 Km. from Mahbubnagar and 73 Km. from Gadwal Railway Stations	134 Km. from Shamshabad Airport at Hyderabad
Veeranjaneya Reservoir at Yedula Village, Gopalpet Mandal, Wanaparthy District	32 Km. from NH-44	93 Km. from Mahbubnagar and 73 Km. from Gadwal Railway Stations	132 Km. from Shamshabad Airport at Hyderabad
Lift-3			
1. Pump House at Vattem Village, Village, Bijinepally Mandal, Nagarkurnool District	32 Km. from NH-44	26 Km. from Jadcherla Railway Station	101Km. from Shamshabad Airport at Hyderabad
2. Venkatadri Reservoir at Vattem Village, Bijinapally Mandal, Nagarkurnool District	27 Km. from NH-44	21 Km. from Jadcherla Railway Station	96Km. from Shamshabad Airport at Hyderabad
Ayacut of Main Canal of Venkatadri Reservoir	14 Km. from NH-44	Accessible from Jadcherla Railway Station	
Link Canal from Venkatadri to Kurumurthyraya Reservoir			
Open Canal	14 Km. from NH-44	20 Km. from Mahabubnagar and 14	

Project Component	Roads	Railway	Airport
		Km. from Jadcherla Railway Stations	
Kurumurthyraya Reservoir at Karvena Village, Boothpur Mandal, Mahabubnagar District	4 Km. from NH-44	21Km. from Mahabubnagar and 13 Km. from Jadcherla Railway Stations	80Km. from Shamshabad Airport at Hyderabad
Ayacut of Main Canal of Kurumurthyraya Reservoir	Passing through NH-44 and Raichur - Mahabub-nagar State Highway	10 Km. from Mahabubnagar and Jadcherla Railway Stations	
Ayacut of Main Canal of Venkatadri Reservoir	14 Km. from NH-44	Accessible from Jadcherla Railway Station	
Pump House at Udandapur Village, Jadcherla Mandal, Mahabubnagar District	9 Km. from NH-44	15 Km. from Jadcherla and 17 Km. from Mahabubnagar Railway Stations	77 Km from Shamshabad Airport. at Hyderabad
Lift-4			
Udandapur Reservoir, Uddandapur Village, Jadcherla Mandal, Mahabubnagar District	7 Km. from NH-44	15Km. from Jadcherla and 20 Km. from Mahabubnagar Railway Stations	77Km. from Shamshabad Airport at Hyderabad
Ayacut of Right Main Canal from CommonCanal and South Main canal from Udandapur Balancing Reservoir	Passing through NH-44	Accessible from Jadcherla Railway Station	
Ayacut of Left Main Canal of Udandapur Reservoir	31 Km. from NH-44	Accessible from Thandur Railway Station	
Aayacut of Maddur Main Canal and Hanwada Main canal of Udandapur Reservoir	passing through SH-23	18 Km. from Mahbubnagar Railway Station	
Lift-5			
Pump House at Padmaram Village, Chowderdudem Mandal, Rangareddy District	30 Km. from NH-44	43Km. from Vikarabad and 30 km Shadnagar Railway Stations	64Km. from Shamshabad Airport at Hyderabad
K P Laksmidevipally Reservoir located Padmaram Village, Chowderdudem Mandal, Rangareddy District	30Km. from NH-44	43Km. from Vikarabad and 30 km from Shadnagar R.S.	64 Km. from Shamshabad Airport at Hyderabad
Ayacut of East and South Main Canals of K P Laksmidevipally Reservoir	Passing through NH-44	Accessible from Shadnagar Railway Station	
Ayacut of North Main Canal of K P Laksmidevipally Reservoir	15 Km. from NH-9/S.H-20	Accessible from Vikarabadand Shadnagar Railway Stations.	

1.4 SALIENT FEATURES

The salient features of the project are presented in table below.

Table 1-3: Project Salient Features

S.N.	Features	Description
A	**HEADWORKS**	
(i)	Source of the project	Srisailam Reservoir across River Krishna
(ii)	Location	Near Yellur village, Kollapur mandal, Mahabubnagar Dist. Telangana State
(iii)	Longitude	16^0-5' N
(iv)	Latitude	78^0-54 'E
(v)	Catchment area	79,530 sq miles
(vi)	Design flood	19 lakhs cusecs.
(vii)	Deep bed level	152.4 m
(viii)	Min. T.W. L	163.00 m
(ix)	Max. Flood level Observed at the dam	187.25 m
(x)	Type of dam	Gravity Dam
(xi)	Top elevation	275.525 m
(xii)	Height of dam from deepest foundation level	143.26 m
(xiii)	Total length at Top	512.0 m
(xiv)	Max. discharging capacity over the crest	37,356 Cumecs
B	**ANJANAGIRI RESERVOIR**	
(i)	Location	Narlapur (V), Kollapur(M)
(ii)	Longitude	78° 22' 46"
(iii)	Latitude	16° 08' 10"
(iv)	TBL	348.500 m
(v)	FRL	345.000 m
(vi)	MDDL	325.250 m
(vii)	Dead Storage	0.56 TMC
(viii)	Live Storage	7.95TMC
(ix)	Catchment Area	9.860sq. Km
(x)	Max. Height of Bund	74.0 m
(xi)	MFD	92.665 Cumecs
(xii)	Ayacut	
C	**VEERANJANEYA RESERVOIR**	
(i)	Location	Yedula Village, Gopalpet Mandal
(ii)	T.B. L	+ 450.000 m
(iii)	F.R. L	+ 445.000 m
(iv)	M.D.D. L	+ 436.250 m
(v)	Top Width	6.00 m
(vi)	Dead Storage	0.595 TMC
(vii)	Live Storage	5.955 TMC
D	**VENKATADRI RESERVOIR**	
(i)	Type of Dam	Earthenen Dam
(ii)	TBL	+546.000 m
(iii)	FRL	+542.000 m
(iv)	MDDL	+513.140 m
(v)	Sill level for link and irrigation canal	+510.550 m
(vi)	Total /Gross capacity	16.74 TMC
(vii)	Storage at MDDL	0.57 TMC
(viii)	Storage above MDDL	16.24 TMC
(ix)	Total length of bund including hillocks	15.230 km
(x)	Net Length of Bund	14.75 km
(xi)	Max. Height of Bund	57.00 m

S.N.	Features	Description
(xii)	Catchment Area	17.623 Sq.km.
(xiii)	M.F.D.	143.62 cumec
(xiv)	Ayacut	53846 ha
E	**KURUMURTHYRAYA RESERVOIR**	
(i)	Location	Karvena (V), Bhoothpur(M)
(ii)	Type of Dam	Earthenen Dam
(iii)	TBL	535.50 m
(iv)	FRL	531.00 m
(v)	MWL	531.90 m
(vi)	Capacity @ FRL	17.34 TMC
(vii)	MDDL for irrigation canal	490.25 m
(viii)	MDDL for Pumping	512.00 m
(ix)	MFD	357.67 Cumec
(x)	Capacity below MDDL +490.25 M	0.710 TMC
(xi)	Capacity at Sill level +488.300 M @LLc	0.515 TMC
(xii)	Capacity above MDDL	16.63 TMC
(xiii)	Length of Earthen Bund i/c hillocks	14.125 km
(xiv)	Max. Height of Bund @ 3.700 km	61.00 m
(xv)	Ayacut	73,684 ha
(xvi)	Catchment Area	33.41sq .km
F	**UDANDPUR RESERVOIR**	
(i)	Location	Udandapur (V) Jadcherla (M)
(ii)	TBL	+634.000 m
(iii)	FRL	+629.000m
(iv)	MWL	+629.900m
(v)	Capacity @ FRL	16.03
(vi)	MDDL for common main canal	+607.250m
(vii)	MDDL (for Pumping)	+610.000m
(viii)	Capacity below MDDL +590.30 M	0.45 TMC
(ix)	Capacity below Sill level +588.250 M	0.27 TMC
(x)	Capacity above MDDL	15.58 TMC
(xi)	Length of Earthenen Bund i/c hillocks	15.825 km
(xii)	Net length of Earthenen bund	15.575 km
(xiii)	Max. Height of Bund	57.595 m
(xiv)	Catchment Area	16.962 m
(xv)	MFD	139.156 Cumec
(xvi)	Ayacut	2,03,239 ha
(xvii)	Submergence Area	4860 ha
G	**K P LAKSMIDEVIPALLE RESERVOIR**	
(i)	TBL	673 m
(ii)	FRL	670 m
(iii)	MWL	670.90 m
(iv)	Capacity @ FRL	2.80 TMC
(v)	MDDL for irrigation canals	651.00 m
(vi)	Capacity below MDDL +646.600	0.54 TMC
(vii)	Length of Earthenen Bund	6.050 km
(viii)	Max. Height of Bund	51 m
(ix)	Ayacut	167,207 ha
(x)	Free catchment	8.658 sq km
(xi)	MFD	84.028 Cumec
H	**IRRIGATION**	
(i)	Gross Command Area (GCA)	8,83,945 ha

S.N.	Features	Description				
(ii)	Culturable Command Area (CCA0	4,97,976 ha				
(iii)	District wise GCA /CCA/number of villages					
(iv)	Mahabubnagar	297,905ha / 160,435 ha/402				
(v)	Rangareddy	242,358ha / 145,363ha/330				
(vi)	Vikarabad	253,016ha / 138,442ha/417				
(vii)	Nagarkurnool	69,839ha / 41,858ha/61				
(viii)	Nalgonda	20,827ha/ 11,878ha/16				
(ix)	Number of Village/ Mandal Benefitted	1226/70				
(x)	Existing Cropping Pattern					
(xi)	Kharif	3,56,944 ha (71.68%)				
(xii)	Rabi	44,660 ha (8.97%)				
(xiii)	Annual	4,01,604ha (80.65%)				
(xiv)	Proposed Cropping Pattern					
(xv)	Kharif	4,95,835ha (99.57%)				
(xvi)	Rabi	77,887 ha (15.64%)				
(xvii)	Annual	5,73,722ha (115.20%)				
I	**CANALS**					
(i)	Type of Canals	Trapezoidal Lined Canals				
(ii)	Nunber of Main canals/Length	13No./915.47 km				
(iii)	Canal wise length/CCA/					
(iv)	CANAL NAME	Length(km)	CCA (ha)	Q(cumec)	B(m)	ASD(m)
	Venkatadri Low Level Canal	29.60	6,478	7.035	5.80	1.30
	Venkatadri Main Canal	152	47,368	47.84	14.40	2.80
	Kurumurthyraya High Level Canal	108	61,134	62.68	16.50	3.00
	Kurumurthyraya Left Low Level	36	12,551	12.99	7.75	1.55
	Hanwada Canal	22.74	11775	8.02	3.10	1.90
	Madur Canal	113.2	69601	68.75	15.50	3.00
	Udandapur 1R-Main Canal	4.6	3,644	3.887	5.00	1.20
	Udandapur 2R-Main Canal	72	57,490	63.04	11.00	3.60
	Udandapur Left Main Canal	137.73	48,583	130.61	17.00	5.00
	Udandapur South Main Canal	25	12,146	15.000	6.00	1.75
	KPL East Main Canal	106	81,296	97.712	14.00	4.10
	KPL North Main Canal	89	72,065	72.832	13.00	3.37
	KPL South Main Canal	19.6	13,846	15.04	5.25	2.10
J	**PROJECT COST**					
(i)	UNIT - I: Head Works- Main Conduit System	Rs.40,515.98 Crores				
(ii)	UNIT - II: Canal and Distribution system	Rs.8,069.03 Crores				
(iii)	UNIT - III: Power to Pumping Stations	Rs.3,471.31 Crores				
(iv)	Total Cost (Unit -I +Unit-II +Unit-III)	Rs.52,056.31 Crores				
(v)	B.C. Ratio	1.25:1				

1.5 COMMAND AREA OF THE PROJECT

Water from Krishna River will be lifted initially to Anjanagiri reservoir and then to Veeranjaneya reservoir. However, no command area is likely to be benefited with these two reservoirs. From Veeranjaneya reservoir, water will be lifted to Kurumurthiyraya reservoir and will be carried to command areas in parts of Mahabubnagar district through right and left main canals. Thereafter, it's proposed to lift the water to

the command areas in Mahabubnagar, Nalgonda, Rangareddy, Vikarabad, Nagarkurnool districts through 13 main canals, which have a combined GCA and CCA 8,83,945 ha and 4,97,976 ha respectively.

1.6 GROSS COMMAND AREA (GCA)

The gross command area under Pase -II of PRLIS is sprawled over five districts namely Mahabubnagar, Nagarkurnool, Rangareddy, Vikarabad and Nalgonda in Telangana State. The command area villages are spread over 22 mandals (402 villages) in Mahabubnagar district, 20 mandals (330 villages) in Rangareddy, 18 Mandals (417 villages) of Vikarabad district, 8 mandals (61 villages) of Nagarkurnool district and only2 mandals (16 villages) in Nalgonda district. Majority (33.70%) of the GCA is in Mahabubnagar district and is followed by districts Vikarabad (28.62%), Rangareddy (27.42%), Nagarkurnool (7.90%) and Nalgonda (2.36%) respectively. The district wise command coverage in terms of number of mandals and villages and GCA is presented in **Table 1.4.**

Table 1-4: District wise coverage of GCA

S No	District	No. of Mandals	No. of Villages	GCA (ha)	% of Total GCA(ha)
1	Mahabubnagar	22	402	297,905	33.70
2	Nagarkurnool	8	61	69,839	7.90
3	Nalgonda	2	16	20,827	2.36
4	Rangareddy	20	330	242,358	27.42
5	Vikarabad	18	417	253,015	28.62
Total		**70**	**1226**	**8,83,945**	**100.00**

1.7 CULTIVABLE COMMAND AREA (CCA)

The project command is spread over five districts of the state of Telangana located in Southern peninsular India. The topography of the proposed command areas is mostly undulating and is characterized by ridges and valleys, isolated hillocks and plane topography. The general slope of the land is from West to East and South East. Isolated hills and hill ranges are also present in the command areas. The average elevation in the command area of the project is over 500 m. The Cultivable Command Area (CCA) of the project is assessed to 497,976 ha after accounting for areas not available for cultivation in the GCA. Thus, about 56.34% of GCA is available for cultivation and/or irrigation under the project. District wise abstract of command area is given in **Table 1.4.**

Table 1-5: District wise CCA

S No	District	GCA (ha)	CCA (ha)	% CCA to GCA
1	Mahabubnagar	297,905	160,435	53.85
2	Nagarkurnool	69,839	41,858	59.93
3	Nalgonda	20,827	11,878	57.03
4	Rangareddy	242,358	145,363	59.98
5	Vikarabad	253,015	138,442	54.72
Total		**8,83,945**	**497,976**	**56.34**

40.81%of the total CCA area will be irrigated by the six main canals of Udandapur with combined CCA of 2,03,239 ha, followed by K P Lakshmidevipally Reservoir with 167,207 ha (33.57%), Kurumurthiyraya Reservoir with73,684 ha (14.80%), and 53,846 ha (10.81%) by Venkatadri Reservoir. Two reservoirs viz., Lakshmidevipally Reservoir and Udandapur Reservoir account for over 74.38 % of total net command area of project. Reservoir and main canal wise gross and net command areas of PRLIS is presented **in Table 1.6.**

Table 1-6: Reservoir and main canal wise gross and net command areas of PRLIS

RESERVOIR	CANAL NAME	GCA, ha	CCA, ha	% CCA to GCA
VENKATADRI	Venkatadri Low Level Canal	10,598	6,478	61.12%
	Venkatadri Main Canal	71,541	47,368	66.21%
VENKATADRI TOTAL		**82,139**	**53,846**	**65.55%**
KURUMURTHYRAYA	Kurumurthyraya High Level Canal	116,634	61,134	52.42%
	Kurumurthyraya Left Low Level Canal	21,874	12,550	57.38%
KURUMURTHYRAYA TOTAL		**138,508**	**73,684**	**53.20%**
UDANDAPUR	Hanwada Canal	21,573	11,775	54.58%
	Madduru Canal	127,512	69,601	54.58%
	Udandapur 1R-Main Canal	8,876	3,644	41.05%
	Udandapur 2R-Main Canal	102,495	57,490	56.09%
	Udandapur Left Main Canal	96,383	48,583	50.41%
	Udandapur South Main Canal	24,486	12,146	49.60%
UDANDAPUR TOTAL		**381,325**	**203,239**	**53.3%**
K.P LAKSHMIDEVIPALLY	KPL East Main Canal	127,207	81,296	63.91%
	KPL North Main Canal	135,539	72,065	53.17%
	KPL South Main Canal	19,226	13,846	72.02%
KPL TOTAL		**281,973**	**167,207**	**59.30%**
GRAND TOTAL		**883,945**	**497,976**	**56.34%**

1.8 CCA BY DISTRICTS

Of the total CCA of 497,976 ha, major part i.e., 33.5 % is in Mahabubnagar district. Likewise, the major part of the command (40.8%) is irrigated from Udandapur reservoir through its six proposed main canals. District and reservoir wise CCA of project is presented in **Table 1.7.**

Table 1-7: District wise Culturable Command Area

District	Reservoir				Total	
	Venkatadri	Kurumurthiraya	Udandapur	KPL	Area, ha	%
Mahabubnagar	13,047	73,684	63849	9,855	160,435	**32.21**
Nagarkurnool	24,195	0	17,663	0	41,858	8.4
Nalgonda	9,828	0	0	2,051	11,878	2.4
Rangareddy	6,777	0	22,776	115,811	145,363	29.1
Vikarabad	0	0	98951	39,491	138,442	27.8
Total	**53,846**	**73,684**	**203,239**	**167,207**	**497,976**	**100.0**
%	**10.81**	**14.8**	**40.8**	**33.58**	**100.0**	

1.9 BRIEF DESCRIPTION OF PROJECT COMPONENT

The works under Phase-I, primarily involves construction of series of approach channels, open canals, tunnels, pump houses and reservoirs for conducting water to various stages of lift and storing it for consumptive use in drinking water, industrial uses and irrigation. The description for various stages of lift is given in following sub-section.

1.10 LIFT-1

The Approach channel starts from foreshore of the Srisailam Reservoir and the length of the approach channel is 2.205km. The depth of cut varies from 0.00 m to 49.00 m in length of 2.205 km at the location of Intake structure. The radius of curvature adopted is 1000 m to minimize land acquisition **(Table 1.8).**

Table 1-8: Salient Features of Approach Channel

Particulars	Running 8 pumps
Discharge (Required)	984.00 Cumecs
Discharge (Designed)	986.30 Cumecs
Bed width	52.0 m
FSD	10.00 m
Free Board	1.00 m
Bed fall	1 in 4350
Side slope	0. 5: 1
Coefficient of Rugosity	0.035
Velocity	1.650 m/sec

The length of the tunnel is 0.876 m. The bottom level of the intake structure is +218.840 and top level of the structure is +273.000. The tunnel intake structure consists of gates, bell mouth chamber, gate chamber, trash track, gate grooves and hoist mechanism. Main purpose of the structure is smooth maintenance of main tunnel. In tunnel intake structure return walls, side return walls and wing walls are provided. As per the ERM data at tunnel intake structure, good rock is available.

Pumping Station:

First Stage Pumping Station (Anjanagiri Pumping Station) is located at Anjanagiri reservoir near Narlapur village, Kollapur mandal, Nagarkurnool district. In this pumping station, 8 pumps and one standby pump having a rating of 145 MW for each pump are proposed to be installed, to draw water from back waters of Srisailam reservoir with MDDL at EL. of + 250 m, by gravity through 2.205 km open canal and 0.876 m tunnel and filled in Anjanagiri balancing reservoir near Narlapur at FRL of + 345.00 m. At this pumping station water is pumped to a static head of 104 m and discharge of each pump will be 85 cumec (3000 Cusecs). Total discharge by all pumps will be 2.0 TMC /day. Power demand for all 8 pumps will be about 1160 MW and energy consumption will be about 1,223 million units per year. The estimated energy charges at the rate of Rs 5.70 per unit will be about Rs. 697.11 Crores per annum.

1.11 LIFT-2

The length of approach is about 2.650 km. The key Hydraulic particulars are tabulated in **Table 1.9.**

Table 1-9: Hydraulic particulars of Lift-2 Approach Channel

Features	
Discharge	984 Cumec
Bed Width	15.00 m
F.S. D	20.25 m
Side Slopes	0.5:1 in Hard Rock
	1.5:1 in All Soils
Bed Fall	1 in 4300
n (Rugosity) Coefficient)	0.035

The length of Open Canal is about 5.925 km. The Hydraulic particulars are tabulated in **Table 1.10.** Berms are proposed at every 10 m interval wherever the depth of cutting is found to be more than 10 m.

Table 1-10: Hydraulic particulars of Lift-2 Open Canal

Features	
Discharge	656 cumec
Bed Width	12.00 m
F.S.D	20.00 m
Side Slopes	0.5:1 in Hard Rock
	1.5:1 in All Soils
Bed Fall	1 in 12000
n (Rugosity Coefficient)	0.035

Second Stage Pumping Station (Veeranjaneya Pumping Station) is located at Veeranjaneya reservoir near Tegalapally village, Kodair mandal, Nagarkurnool district. In this pumping station 9 Nos. pumps each of 145 MW rating are being installed and further an additional standby pump to draw water from back waters of Anjanagiri balancing reservoir with MDDL at 325.250 m, by gravity, through 5.925 km open canal and 15.891 km tunnel and filled in Veeranjaneya balancing reservoir near Yedula at FRL +445.00 m. At this pumping station water is pumped to a height of 124 meters discharge of each pump will be 75 cumecs (2,650 cusecs). Total discharge by all pumps will be 2 TMC / day. Power demand of all the pumps will be about 1305 MW and energy consumption will be about 1506 million units per annum. Energy charges will be about Rs. 858.42 Crores/year. From this reservoir, 30 TMC @ 0.5 TMC/day of water will be taken to fill Upper Dindi balancing reservoir to meet the ayacut in Nalgonda district and balance 90 TMC of water @ 1.5 TMC/ day will be taken to Stage-3 pumping station near Vattem village.

1.12 LIFT-3

The length of approach canal is about 3.30 km, whereas the length of open canal is about 3.10 km. The Hydraulic particulars are tabulated in **Table 1.11** and **Table 1.12.**

Table 1-11: Hydraulic Particulars of Lift-3 Approach Channel

Features	
Discharge	984 cumec
Bed Width	30.00 m
F.S.D.	11.25 m
Side Slopes	0.5:1 in Hard
	1.5:1 in All other Soils
Bed Fall	1 in 2200
n (Rugosity Coefficient)	0.035

Table 1-12: Hydraulic Particulars of Lift-3 Open Canal

Features	
Discharge	656 cumec
Bed Width	18.00 m
F.S.D.	11.00 m
Side Slopes	0.5:1 in Hard Rock
	1.5:1 in All Soils
Bed Fall	1 in 1810
N (Rugosity Coefficient)	0.035

Third Stage Pumping Station (Venkatadri Pumping Station) is located at Venkatadri reservoir, near Vattem village, Bijinepally mandal, and Nagarkurnool district. In this pumping station 9+1 Nos. pumps of 145 MW (145000KW) rating is being installed to draw water from back waters of Yedula balancing reservoir with MDDL at EL. +436.250 M, by gravity, through 6.40 Km open canal and 21.475 Km tunnel and filled in Venkatadri balancing reservoir near Vattem at FRL +542.00 M. At this pumping station water is pumped to a height of 121 M and discharge of each pump will be 75 Cumecs (2,650 Cusecs). Total design discharge by all pumps will be 2 TMC/day. Power demand of all pumps will be about 1305 MW and energy consumption will be about 1484 million units per year. Energy charges will be about Rs.846 Crores/year.

From this reservoir 30 TMC @ 0.5 TMC/day of water will be taken to meet the ayacut in Nalgonda district and balance 60 TMC of water @ 1.5 TMC/day will be taken to Stage-4 pumping station near Udandapur.

1.13 LIFT-4

Approach channel is proposed from km (-) 1.525 to km (-) 0.090 in the Karvena reservoir **(Table 1.13).** Head regulator proposed at k.m (-) 0.350. With sill level +503.00. The canal is designed with side slope 0.5:1 for rock cutting. The discharge is taken as 1.5 time's normal discharge. The Hydraulic particulars are provided in **Table 1.13.**

Table 1-13: Hydraulic Particulars of Lift-4 Approach Channel

Sl. No.	Features	Description
1.	Discharge required	565.50 Cumecs
2.	Discharge designed	594.559 Cumecs
3.	Bed width	41.00 M
4.	F.S.D.	9.25 M
5.	Free Board	1.0 M
6.	Value of "n"	0.035
7.	Side slopes (I/O)	0.5:1
8.	Bed Fall	1 in 5740- (Surface Fall)
9.	T.W. of Banking(L/R)	-
10.	Bed Level	+503.000 M
11.	F.S.L.	+512.250 M
12.	T.B.L.	+513.250 M
13.	G.L.	+532.595 M

Open gravity canal is designed for 377 cumecs (i. e 1.15 TMC per day). Open canal is proposed from km 0.090 to km 0.200 with surface fall 1 in 2800 **(Table 2.13).**

Fourth Stage Pumping Station is located near Udandapur village, Jadcherla mandal, Mahaboobnagar district. In this pumping station 5 nos. pumps of 145 MW (145000KW) rating are being installed to draw water from back waters of Karvena balancing reservoir (Which will be fed from Vattem balancing reservoir) with MDDL at EL.+515.00 M, by gravity, through Approach channel 1.435 km and 8.935 Km tunnel and filled in Udandapur balancing reservoir at FRL +629.00 M. At this pumping station water is pumped to a height of 122 M and discharge of each pump will be 75 Cumecs (2,650 Cusecs). Total discharge by all pumps will be 1.0 TMC /day. Power demand of all pumps will be about 725 MW and energy consumption will be about 807 million units/year. Energy charges will be about Rs. 460 crores/year.

From this reservoir 10 TMC @ 0.5 TMC/day of water will be taken to meet the ayacut in Mahaboobnagar and part of Ranga Reddy districts and 7.5 TMC of water will be taken to twin cities reservoirs to meet the drinking water needs of Hyderabad and Secunderabad. Balance water @ 0.5 TMC/day will be taken to pumping station near K.P Lakshmidevpally.

Table 1-14: Hydraulic Particulars of Lift-4 Open Channel

Sl. No.	Features	Description
1.	Discharge required	377.000 Cumecs
2.	Discharge designed	382.588 Cumecs
3.	Bed width	19.00 M
4.	F.S.D.	9.00 M
5.	F. B	1.0 M
6.	Value of "n"	0.035
7.	Side slopes (I/O)	0.5:1
8.	Bed Fall	1 in 2800
9.	T.W. of Banks (L/R)	5/8
10.	Bed Level	+503.000 m
11.	F.S.L.	+512.000 m
12.	T.B.L.	+513.000 m
13.	G.L.	+532.595 m

1.14 LIFT-5

Approach channel is proposed from km (-) 0.975 to km 0.000 in the Udandapur Reservoir **(Table2.14**). The common canal runs from 0.00 km to 16.612 km on contour alignment. The sill of common canal is + 600.00 m. The MDDL of Udandapur reservoir works out to 607.25 m. The capacity of Udandapur at MDDL is 0.42 TMC which is not utilizable. The balance ayacut 1,67,207 ha is fed by K. P. Laxshmidevipalli reservoir after km 16.50 by open canal and tunnel. Open Gravity Canal from 16.612 Km to 18.850 Km and a transition from km 18.600 to km 18.850 are proposed for conductor system to lift-V of K.P. Laxmidevipalli reservoir. The surface fall adopted in transition is 1 in 119.047.

Fifth Stage Pumping Station is located near padmaram village, chowdergudem mandal, Ranga Reddy district. In this pumping station 3 nos. pumps of 75 MW (75000KW) rating is being installed to draw water from back waters of Udandapur balancing reservoir with MDDL at EL. +607.25 m, by gravity, through 18.850 Km open canal and 14.400 Km tunnel and filled in K.P Lakshmidevipally balancing reservoir (FRL

+670.00 m). At this pumping station water is pumped to a height of 87.5 m and discharge of each pump will be 55 Cumecs (1,945 Cusecs). Total discharge by all pumps will be 0.5 TMC/day. Power demand of all pumps will be about 195 MW and energy consumption will be about 338 million units per annum. Energy charges will be about Rs. 192.66 Crores/year.

From this reservoir, 30 TMC of water will be taken to meet the maximum ayacut in Ranga Reddy and some part of Nalgonda districts.

Table 1-15: Hydraulic Particulars of Lift-5 Approach Channel

Sl. No.	Features	Description
1.	Discharge required	523.571 Cumecs
2.	Discharge designed	525.736 Cumecs
3.	Bed width	71.50 M
4.	F.S.D.	7.25 M
5.	F. B.	0.9 M
6.	Value of "n"	0.035
7.	Side slopes (I/O)	0.5:1
8.	Bed Fall	1 in 10000
9.	T.W. of Banks (L/R)	-
10.	Bed Level	+600.098 M
11.	F.S.L.	+607.348 M
12.	G.L.	+602.275 M
13.	Length of open channel	18.850 Km
14.	Length of tunnel	14.40 Km

1.15 LIVE STORAGES AND PRINCIPAL LEVELS

The live storages of proposed balancing reservoirs are assessed considering the temporal distribution water demand for irrigation and other uses as well as water availability at source. Based on this analysis, requirement of live storage of reservoirs is assessed to be 63.34 TMC (1793.60 MCM) and the reservoir wise MDDL, FRL and live storage of PRLIS Project are shown in **Table 1.16**

Table 1-16: Reservoir wise designed MDDL, FRL and live storage

S. N.	Reservoir	MDDL	FRL	MWL	Live Storage	
					TMC	MCM
1.	Anjanagiri	325.250	345.00	345.90	7.950	225.12
2.	Veeranjaneya	436.250	445.00	445.90	5.910	167.35
3.	Venkatadri	513.140	542.00	542.90	16.40	464.396
4.	Kurumurthiyraya	490.250	531.00	531.90	16.82	476.43
5.	Udandapur	590.300	629.00	629.90	15.76	446.27
6.	K.P Lakshmidevipally	651.000	670.00	670.90	2.4	70
Total					**65.24**	**1847.54**

1.16 DESCRIPTION OF WATER CONDUITS BETWEEN RESERVOIRS

The details of water conductor system from one reservoir to another reservoir, the discharge to be lifted and number of pumps required for each stage lifting have been given in **Table 1.17**

Table 1-17: Reservoir wise Details of Water Conduit and Pumps

Stage	Reservoir	Station Name	Open Canal (km)	Tunnel (km)	No. of Pumps	Standby Pumps	Discharge of each pump (cumec)
1	Anjanagiri	Anjanagiri	2.205	0.876	8	1	85
2	Veeranjaneya	Yedeula	8.575	15.891	9	1	75
3	Venkatadri	Venkatadri	6.400	21.475	9	1	75
4	Kurumurthiyraya	From Venkatdari	12.050	-	-	-	-
5	Udandapur	Udandapur	1.435	8.935	5	-	75
6	K.P Lakshmidevipally	K.P Lakshmidevipally	19.825	14.400	3	-	55

1.17 MAIN CANAL, DISTRIBUTARY AND MINORS

Under Phase -II the project activities, for which ToR has been issued by the MoEF&CC, New Delhi, shall involve construction of 13 main canals (Total length 915.47 km) and distribution network. The length and canal wise CCA proposed is shown in **Table 1.18**

Table 1-18: Length and CCA Proposed under Each Canal

RESERVOIR	CANAL NAME	Length	GCA, ha	CCA, ha
VENKATADRI	Venkatadri Low Level Canal	29.6	10,598	6,478
	Venkatadri Main Canal	152	71,541	47,368
VENKATADRI TOTAL		**181.6**	82,139	53,846
KURUMURTHYRAYA	Kurumurthyraya High Level Canal	108	116,634	61,134
	Kurumurthyraya Left Low Level	36	21,874	12,551
KURUMURTHYRAYA Total		**144**	138,508	73,684
UDANDAPUR	Hanwada Canal	22.74	21,573	11775
	Madur Canal	113.2	127,512	69601
	Udandapur 1R-Main Canal	4.6	8,876	3,644
	Udandapur 2R-Main Canal	72	102,495	57,490
	Udandapur Left Main Canal	137.73	96,383	48,583
	Udandapur South Main Canal	25	24,486	12,146
UDANDAPUR Total		**352.53**	381,325	203,239
K.P LAKSHMIDEVIPALLY	KPL East Main Canal	106	127,207	81,296
	KPL North Main Canal	89	135,539	72,065
	KPL South Main Canal	19.6	19,226	13,846
KPL Total		**214.6**	281,973	167,207
Grand Total		**915.47**	883,945	497,976

The canals shall be lined andcanal capacity has been fixed on the basis of peak requirement that includes 10% extra for rush irrigation. The canal section has been provided with side slopes, berm width, service road width, free board as per IS 7112: 2002, "Criteria for design of cross section for unlined canals in alluvial soil. The details of authorised head discharge of canals and with some of the hydraulic parameters at head have been elucidated in **Table 1.19**. Typical canal sections in different situations viz., in deep cutting, in partial cutting and filling (banking) and in full filling (banking) is shown in **Figure 1.6.**

Table 1-19: Details of Authorised Head Discharge and Canal Section at Head

S.N.	Canal Name	Length	CCA (ha)	Q(cumec)	B(m)	FSD(m)
1	Venkatadri Low Level Canal	29.6	6,478	7.035	5.80	1.30
2	Venkatadri Main Canal	152	47,368	47.84	14.40	2.80
3	Kurumurthyraya High Level Canal	108	61,134	62.68	16.50	3.00
4	Kurumurthyraya Left Low Level	36	12,551	12.99	7.75	1.55
5	Hanwada Canal	22.74	11775	8.02	3.10	1.90
6	Madur Canal	113.2	69601	68.75	15.50	3.00
7	Udandapur 1R-Main Canal	4.6	3,644	3.887	5.00	1.20
8	Udandapur 2R-Main Canal	72	57,490	63.04	11.00	3.60
9	Udandapur Left Main Canal	137.73	48,583	130.61	17.00	5.00
10	Udandapur South Main Canal	25	12,146	15.000	6.00	1.75
11	KPL East Main Canal	106	81,296	97.712	14.00	4.10
12	KPL North Main Canal	89	72,065	72.832	13.00	3.37
13	KPL South Main Canal	19.6	13,846	15.04	5.25	2.10

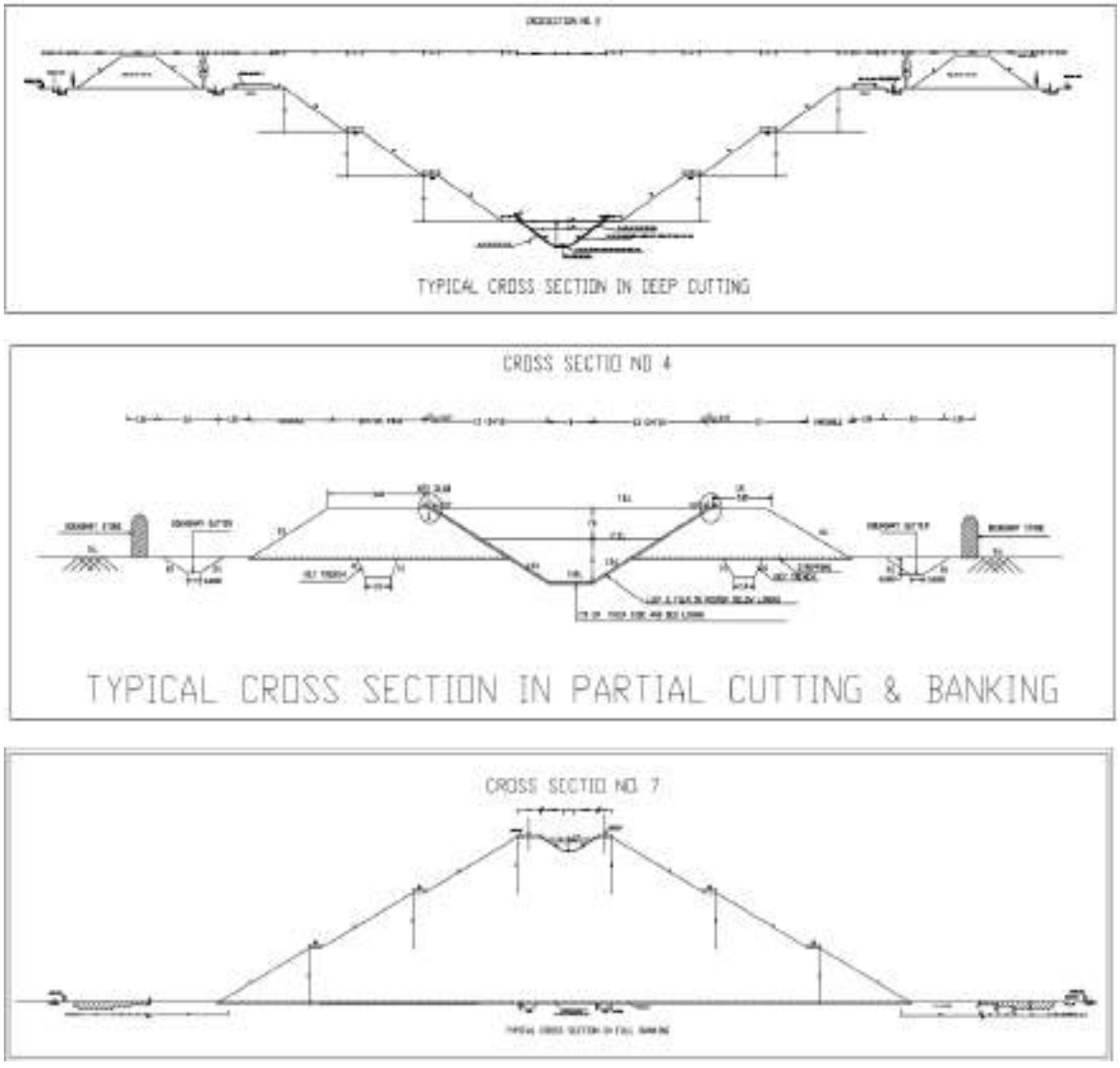


Figure 1-6: Typical Cross Section of Canal

1.18 IRRIGATION PLANNING AND CROPPING PATTERN

The moot point for irrigation planning of a water resource project in an area where monsoon flow of a river has to be harnessed are the water availability for irrigation purpose besides the existing cropping pattern and the proposed cropping pattern, the existing modes of irrigation. Based on the proposed cropping pattern the crop water requirement for area proposed for different crops is computed and month wise requirement are worked out.

1.19 EXISTING IRRIGATION FACILITIES IN THE COMMAND AREA

District wise and source wise details of irrigation are given below in **Table 1.20**

Table 1-20: Existing Irrigation Facilities in Command Area

Sl. No.	New District	Net Area (in ha) Irrigated under						
		Canal	Tanks	Tube Wells	Dug Wells	Small Lifts	Others	Total
1	Mahabubnagar	415	1,708	26,653	235	17	12	29,040
2	Nagarkurnool	0	94	7,328	105	0	0	7,527
3	Nalgonda	0	0	925	71	0	0	996
4	Rangareddy	0	67	16,251	336	0	0	16,654
5	Vikarabad	467	1,200	10,140	1,627	0	0	13,434
Total		882	3,069	61,297	2,374	17	12	67,651
Percentage		1.3%	4.5%	90.6%	3.5%	0.01%	0.00	100%

1.20 Crops and Their Productivity in the Command

The Pre-project cropping pattern and crop yields, during Kharif and Rabi seasons in the command area of the project are presented in **Table 1.21.**

Table 1-21: Existing Crop and Their Productivity in Command Area

S.N.	Crop	%	Area (Ha)	Yield / Ha (Kg/Ha)	Total yield (Lakh Tons)
Kharif					
1.	Paddy	10.89	54,230	1,757.8	0.95
2.	Maize	11.27	56,102	1,453.4	0.82
3.	Jowar	4.84	24,118	468.0	0.11
4.	Greengram	3.29	16,361	242.2	0.04
5.	Blackgram	1.21	6,012	284.3	0.02
6.	Redgram	14.31	71,260	221.3	0.16
7.	Cotton	15.51	77,213	426.3	0.33
8.	Castor	4.07	20,281	236.5	0.05
9.	Vegetables	1.99	9,930	4,550.6	0.45
10.	Others	4.31	21,438	610.7	0.13
SUB TOTAL		**71.68**	**3,56,944**		**3.06**
Rabi					
1.	Paddy	3.17	15,794	2,006.0	0.32
2.	Maize	0.33	1,658	1,991.9	0.03
3.	Jowar	0.98	4,874	474.2	0.02
4.	Groundnut	2.52	12,569	675.6	0.08
5.	Bengalgram	0.38	1,883	524.1	0.01
6.	Sunflower	0.52	2,574	395.9	0.01
7.	Safflower	0.20	987	428.5	0.00
8.	Others	0.87	4,321	393.2	0.02
SUB TOTAL		**8.97**	**44,661**		**0.50**

S.N.	Crop	%	Area (Ha)	Yield / Ha (Kg/Ha)	Total yield (Lakh Tons)
GRAND TOTAL		**80.65**	**4,01,606**		**3.56**
CCA			4,97,976		
CI, % (with Fallows)			80.6%		
CI, % (without Fallows)			112.5%		

1.21 CROPPING PATTERN AND HORTICULTURE PRACTICES IN THE STUDY AREA

Paddy, Maize, Jowar, Greengram, Blackgram, Redgram, Cotton, Castor and Vegetables are the main crops grown in Kharif season whereas paddy, maize, jowar, groundnut, Bengal gram, sunflower and safflower are the main Rabi crops in the command area of PRLIS. The gross cropped area in the command area of the project is assessed to be 4,01,606 ha and same accounted for 80.6% of the CCA. The net cropped area in the command area of the project is 3,56,944 ha and cropping intensity without considering current fallows and waste land in the CCA is estimated to be 112% **(Table 1.22).**

Table 1-22: Existing Cropping Pattern in Command Area

S.N.	Kharif			Rabi		
	Crop	Area (ha)	%	Crop	Area (ha)	%
1.	Paddy	54,230	10.89	Paddy	15,794	3.17
2.	Maize	56,102	11.27	Maize	1,658	0.33
3.	Jowar	24,118	4.84	Jowar	4,874	0.98
4.	Greengram	16,361	3.29	Groundnut	12,569	2.52
5.	Blackgram	6,012	1.21	Bengalgram	1,883	0.38
6.	Redgram	71,260	14.31	Sunflower	2,574	0.52
7.	Cotton	77,213	15.51	Safflower	987	0.20
8.	Castor	20,281	4.07	Others	4,321	0.87
9.	Vegetables	9,930	1.99	-	-	-
10.	Others	21,438	4.31	-	-	-
Sub Total		**3,56,944**	**71.68**	**Sub Total**	**44,660**	**8.97**

The agronomist's assessment is that even with the introduction of canal irrigation there may not be any major changes in the proposed cropping pattern as compared to the existing cropping pattern in the command area of the project except for the large-scale introduction of chillies cultivation both during Kharif and Rabi seasons. The season wise proposed cropping pattern as suggested by the agronomist in the command area of the project is presented in **Table 1.23.**

Table 1-23: Proposed Cropping Pattern

Sl. No.	Crop	%	Area (Ha)
Kharif			
1.	Maize	19.79	98,533
2.	Chillies	15.54	77,369
3.	Blackgram	6.14	30,559
4.	Redgram	19.44	96,824
5.	Cotton	17.89	89,072
6.	Castor	1.59	7,901
7.	Vegetables	17.27	85,984
8.	Others	1.93	9,595
SUB TOTAL		**99.57**	**4,95,835**
Rabi			
1.	Vegetables	4.40	21,888

Sl. No.	Crop	%	Area (Ha)
2.	Groundnut	2.84	14,123
3.	Bengalgram	2.01	9,987
4.	Chillies	6.40	31,888
SUB TOTAL		**15.64**	**77,887**
GRAND TOTAL		**115.21**	**5,73,722**
	CCA		4,97,976
	CI, %		**115.21%**

1.22 Crop Water Requirement

For computing crop water requirements Penman – Montieth method has been used and crop water requirements are computed for the crops proposed for cultivation in the command area of this project. The irrigation water requirement of the command area is assessed to be 1,410.91 MCM (49.83 TMC) consisting of 1,156.65 MCM (40.85 TMC) during Kharif season and 254.26 MCM (8.98 TMC) during Rabi season. Crop wise and season wise irrigation water requirement of the command area of all reservoirs of the project cumulatively presented in **Table 1.24.**

Table 1-24: Irrigation Water Requirement

Sesona and Crop		%	Area, ha	NIR, mm	Total Water Requirement, MCM	Total water Requirement TMC	TMC Proposed from Project As SW	TMC Required from GW
Kharif								
1.	Maize	19.79	98,533	184.92	182.21	6.43	5.30	1.14
2.	Chillies	15.54	77,369	292.60	226.38	7.99	6.58	1.42
3.	Blackgram	6.14	30,559	68.90	21.05	0.74	0.61	0.13
4.	Redgram	19.44	96,824	271.03	262.42	9.27	7.63	1.64
5.	Cotton	17.89	89,072	281.83	251.03	8.87	7.30	1.57
6.	Castor	1.59	7,901	288.20	22.77	0.80	0.66	0.14
7.	Vegetables	17.27	85,984	204.80	176.09	6.22	5.12	1.10
8.	Others	1.93	9,595	153.06	14.69	0.52	0.43	0.09
SUB TOTAL		**99.57**	**495,835**		**1,156.65**	**40.85**	**33.62**	**7.23**
Rabi								
1.	Vegetables	4.40	21,888	296.31	64.86	2.29	1.88	0.41
2.	Groundnut	2.84	14,123	291.75	41.20	1.46	1.20	0.26
3.	Bengalgram	2.01	9,987	314.85	31.45	1.11	0.91	0.20
4.	Chillies	6.40	31,888	366.15	116.76	4.12	3.39	0.73
SUB TOTAL		**15.64**	**77,887**		**254.26**	**8.98**	**7.39**	**1.59**
GRAND TOTAL		**115.21**	**573,722**		**1,410.91**	**49.83**	**41.01**	**8.82**
CI, %			**115.2%**					

1.23 COMPONENT OF PRESSURIZED/DRIP IRRIGATION AND MICRO IRRIGATION

Government of Telangana has permitted for implementation of Micro Irrigation Scheme / On Farm Water Management component of National Mission for Sustainable Agriculture (NMSA) since October 2011 vide G.O.Ms. No.251 A&C [Hort] Dept and further as outlined in GO MS No. 28, dated 9 December 2014, Government has decided to promote Micro Irrigation Systems in the area of 1,20,000 Acres with Drip and Sprinklers on 100% subsidy for SC&ST Farmers and with 90% subsidy for Small and Marginal Farmers. TSMIP is being implemented with the assistance from Government of India, State Government and farmer contribution. PRLIS Project aims at improving the economic conditions of the farmers by

conserving water, bringing additional area into cultivation with the available water resources, enhancing the crop productivity and production, quality, facilitating judicious usage of ground water, saving in power consumption and cost of cultivation. Sprinkler irrigation is a method of applying water which is similar to natural rainfall but spread uniformly over the land surface just when needed and at a rate less than the infiltration rate of the soil so as to avoid surface runoff from irrigation. This method of irrigation is adopted by farmers owning open or tube well and cultivating horticulture crops like vegetables in the proposed command area of PRLIS. The area covered under the sprinkler irrigation systems in the proposed command area of PRLIS is estimated to be 17,849 ha. In addition, an area of 56,800 ha, command area of PRLIS, is proposed to be covered under this system as part of District Irrigation Plan by 2021. The area covered under the drip irrigation systems in the proposed command area of PRLIS is estimated to be 26,945 ha. In addition, an area of 62,645 ha, command area of PRLIS, is proposed to be covered under drip irrigation system as part of District Irrigation Plan by 2021.

The pressurized irrigation, which is also known as micro irrigation, consists of drip and sprinkler irrigation systems. One of the demand management strategies introduced recently to control water consumption in Indian agriculture is pressurized irrigation or micro irrigation. Under micro-irrigation, unlike flood methods of irrigation, water is supplied at a required interval and quantity using pipe network, emitters and nozzles. Therefore, the conveyance and distribution losses are reduced completely which results in higher water use efficiency under micro irrigation. Incidentally the micro-irrigation also effectively controls the problem of water logging and salinity in the command area of an irrigation project. In view of the above cited advantage of micro-irrigation over flood irrigation method the Government of India is promoting micro-irrigation in the command area of major and medium irrigation projects. Therefore, it is proposed to provide pressurized irrigation system in 10 percent of command area of PRLIS on a pilot basis. Accordingly, 49,798 ha command area (about 10% of 497,976 ha CCA) of PRLIS is proposed to cover under pressurized irrigation.

Main crops namely Maize, Jowar, Fodder, Pulses, Groundnut, Other oilseeds and Vegetables are in Kharif season Gram, Vegetables, Groundnut and Other oilseeds are suggested in Rabi season and Sugarcane as perennial crop are suggested through channel irrigation in the proposed command area of PRLIS. The sprinkler irrigation system can be introduced for these crops except for Maize, Jowar and Sugarcane. Drip irrigation is suitable for horticulture crops such as Commercial crops, Vegetables, tuber crops, Leafy vegetables and Fruits. Since, drip irrigation is very much familiar in the area the same can be introduced in about 65 percent (322,369 ha) of area proposed for pressurized irrigation. About 40 percent and 70 percent water will be saved by sprinkler irrigati on and drip irrigation systems respectively. With the water saving by introduction of pressurized irrigation can reduce the dependency on groundwater utilization.

1.24 CONJUNCTIVE USE OF WATER FOR IRRIGATION

The available surface water of 82.52 TMC will take care of the irrigation requirement of the command area of the project leaving a surplus of 7.48 TMC if the application efficiency is 100%. However, 100% application efficiency will not be possible. Further, the allocated surface water is just sufficient for irrigating the entire command area with application efficiency of 65.62%.

If the application efficiency is 54%, the availability of surface water for irrigation is 41.01 TMC leaving a gap of 8.82 TMC. Assuming the application efficiency of 80 percent the gross groundwater requirement is assessed to be 11.03 TMC. This quantity of water may need to be supplemented with groundwater for irrigation through conjunctive use. Under this scenario the share of surface water is 82% and that of groundwater is 18% **(Table 1.25).** This quantity of groundwater extraction accounts for 32% of additional safe groundwater potential of the command area after the project implementation that can be extracted.

Due to the proposed project, there will be recharge to the groundwater and it may create water logging and drainage problem in the command area in northern part of Mahbubnagar district. Therefore, it is suggested that conjunctive use of the ground water may be encouraged in the command area.

Table 1-25: Surface Water Availability for Irrigating PRLIS Command

Net Crop Water requirement (TMC)	Efficiency rate	Gross Crop Water requirement (TMC)	Evaporation Losses (MC)	Net Availability (82.52 TMC) with the Efficiency	Source of Crop Water requirement, TMC		% GW Extraction required at 80% Efficiency	% Extraction to Safe additional GW withdrawal (34.53 TMC)	% Crop Water requirement	
					SW	GW			SW	GW
49.83	100.00 %	49.8283	6.582	75.94	75.94	-	-	-	100	-
49.83	90.00%	55.3647	6.582	68.34	68.34	-	-	-	100	-
49.83	75.00%	66.4377	6.582	56.95	56.95	-	-	-	100	-
49.83	65.62%	75.9347	6.582	49.83	49.83	0.00	-	-	100	-
49.83	54.00%	92.2746	6.582	41.01	41.01	8.82	11.03	32	82	18
49.83	50.00%	99.6565	6.582	37.97	37.97	11.86	14.82	43	76	24
49.83	48.75%	102.2118	6.582	37.02	37.02	12.81	16.01	46	74	26

1.25 DOMESTIC AND INDUSTRIAL WATER REQUIREMENT

Water demand norm of the Government of Telangana – 85 litres per capita per day (lpcd) for rural area and 165 lpcd for urban area, is used in computation of current domestic water demand. The projected population of the district in the year 2021 is computed on the basis of decadal growth in population of respective districts between 2001 and 2011. The computation of Industrial water demand is based @ 25% of water demand in urban area sand in rural areas @5 percent of total domestic water demand. It is estimated that 0.325 TMC is required and earmarked for this purpose, details are shown in **Table 1.26.**

Table 1-26: Domestic and Industrial Water Requirement

SN	Particulars	Urban	Rural	Total
1	Population of Project Command area villages (2021)	2,03,175	34,30,571	36,33,746
2	LPCD requirement	165	85	250
3	Annual domestic water requirement in MCM	12.24	106.43	118.67
4	Annual domestic water requirement in TMC	0.43	3.76	4.19
5	Hyderabad City water requirement in TMC	2.31		2.31

SN	Particulars	Urban	Rural	Total
6	Total Domestic requirement	2.74	3.76	6.50
7	Total Domestic requirement i/c10% Transmission lose (TMC)	**3.01**	**4.14**	**7.15**
8	Annual industrial water requirement in TMC	0.11	0.19	0.30
9	Total Industrial requirement including 10% Transmission losses	**0.12**	**0.21**	**0.33**
10	Annual domestic and industrial water requirement in TMC	**3.13**	**4.34**	**7.48**

1.26 CONSTRUCTION MATERIAL REQUIREMENT AND SOURCE

Construction materials are required for various project components i.e., series of reservoirs, water conveyor system consisting of gravity canal and tunnel, lift system, CM & CD structures and distributary network system. The construction material needed for this project include cement, sand, coarse aggregates, revetment stones, reinforcement steel and structural steel. The quantities of the materials are estimated as follows:

- Revetment: 45,000 MT
- Coarse Aggregate: 75,36,962 MT
- Fine Aggregate: 33,49,762 MT
- Soils: 2,75,59,517 MT.

Locally available materials, using excavated rock and soils. The construction materials will be procured from respective sources to the work sites.

1.27 LAND REQUIREMENT FOR THE PROPOSED PROJECT

The total land requirement for Phase II shall be 27,905ha which comprise of 12,115ha and 15,790 ha respectively. The apportionment between Government, Patta and forest land requirement under Phase-I shall be 2403.42ha,9545.17 ha and 205.48 ha respectively, while under Phase-II is shown in **Table 1.27.**

Table 1-27: Land Requirement for Main Canal and Distribution System (ha)

S.N.	Particulars	Nagarkurnool	Mahabubnagar	Nalgonda	Rangareddy	Vikarabad	Total
1	Govt Land	124	443	10	395	1726	2698
2	Patta Land	1,406	4,448	172	3,917	3,149	13,092
3	Forest Land	-	-	-	-	-	-
Total Land		1,530	4,891	182	4,312	4,875	15,790.00

1.28 ALTERNATE SITE STUDIES

The project is envisaged to lift water from foreshore of either Jurala Reservoir or Srisailam reservoir to K. P. Lakshmidevipally, as there were only two sources of water. Both are lift irrigation schemes and there are no chances for gravitational flow. There is no third alternative with regard to source of water.

A detailed study had been carried out for lifting water from Jurala Reservoir. Though Jurala is advantageous from the point of gradient, it could not be considered, because there is no adequate storage capacity in the project. The gross storage capacity of Jurala at FRL is 11.94 TMC, while the water requirement of proposed project is 90 TMC. Further, sufficient flood water is not available in Jurala. Hence it is not feasible to lift 90 TMC from Jurala Source.

The gross storage capacity of Srisailam Reservoir is 215 TMC. Thus, lifting of water from Srisailam Reservoir has been proposed, which is having sufficient capacity. With regard to Srisailam Reservoir two alternatives are explored. The details are as follows:

1.28.1 Alternative-1

In this proposal, flood water is lifted from Srisailam reservoir near Kalwakurthy Lift and dropped in to existing Yellur reservoir, from Yellur reservoir to Singotam reservoir by gravity with widening the existing canal system, from Singotam reservoir to Jonnalabogada reservoir by lift and widening the existing canal system, from Jonnalabogada reservoir to Gudipallygattu reservoir by lift and widening the existing canal system, from Gudipallygattu to Maganur by widening the existing Kalwakurthy main canal system, from Maganur to Marikal by gravity and lift and from Marikal it is linked to the system already prepared for Palamur –Rangareddy scheme from Jurala. In this proposal Pumps and tunnels are new and open canals are utilized by widening the existing canal system of Kalwakurthy. However, there is a possibility of delay in giving water to the proposed ayacut of 3.4 lakh acres under the existing Kalwakurthy Lift Irrigation Scheme (KLIS), since the pumping of water under KLIS may need to be suspended for taking up construction under PRLIS. Therefore, this proposal was droped.

1.28.2 Alternative-2

Water is proposed to be drawn from Srisailam to Jannalabogada with tunnel and lift, from Jonnalabogada to proposed Vattem reservoir by gravity and lift, from Vattem reservoir to Markal by gravity and from Marikal it is linked to the system already prepared for Palamur – Rangareddy scheme from Jurala. In this proposal Pumps, Reservoirs, open canals and tunnels are new. Existing Jonnalabogada reservoir is utilized.

1.28.3 Review of Alternatives 1 & 2

Meanwhile the Honorable Chief Minister has conducted review meeting with ENC (IW), CE(P), TREF and ESCI officials on Dt.15-5-2015 and seen the proposals of alternatives 1 and 2 prepared by ESCI. After having detailed discussions on above 2 alternatives, it is opined that in the alternative 2 proposal, the lift height is about 150 m and suggested to reduce the height of Lift to 100 m by introducing one or two more lifts in-between based on feasibility study in the ground. With the above objective, the following alternative proposals considering 5 Lifts and 6 lifts without linking the existing Kalwakurthy scheme were studied.

1.28.4 Alternative with 5 Lifts

Water was proposed to be drawn from foreshore of Srisailam reservoir to the proposed Narlapur Reservoir with gravity and lift, from Narlapur to proposed Yedula reservoir by gravity and lift, from Yedula reservoir to proposed Vattem reservoir by gravity and lift, from Vattem to proposed Lokerevu reservoir by gravity and lift and from Lokerevu it was propose to be linked to the system, already contemplated Palamuru – Rangareddy scheme with Jurala reservoir as source. In this proposal Pumps, Reservoirs, open canals and tunnels are new.

The Cost estimate (tentative) for the above alternatives i.e., with five and six lifts was prepared and the alternative with 5 lifts was found to be economical.

1.28.5 Final Acceptance & Choice of Project

The project is envisaged to lift water from foreshore of either Jurala Reservoir or Srisailam reservoir to K.P. Lakshmidevipally. A detailed study had been carried out for lifting water from Jurala Reservoir. However, lifting of water from Jurala Reservoir had been dropped in view of less storage capacity of that reservoir.

There were only two sources of water. Either water for the project has to be drawn from Jurala Indira Priyadarshini Reservoir or Srisailam Reservoir. Both are lift irrigation schemes and there are no chances for gravity flow. There is no third alternative with regard to source of water. Though Jurala is advantageous from the point of gradient, it could not be considered, because there is no adequate storage capacity in the reservoir. The gross storage capacity of Jurala at FRL is only 11.94 TMC, while the water requirement of proposed project is 90 TMC. Further, sufficient flood water is not available in Jurala. Hence it is not feasible to lift 90 TMC from foreshore of Jurala reservoir. The gross storage capacity of Srisailam Reservoir is 215 TMC. Thus, proposed to lift water from Srisailam Reservoir, which is having sufficient capacity.

Two alternative alignments have been considered from foreshore of Srisailam reservoir to Anjanagiri reservoir (first reservoir). The details are as follows with reference to alignment. Finally, keeping in view of the Technical and also environmental superior because of less submergence of forest land Underground Pump house (alignment-2) from foreshore of Srisailam is selected than Open Pump house (alignment-1). Comparison of these two alternatives of alignment is presented in **Table 1.28**.

Table 1-28: Detailed Analysis of Alternative Alignments

Sl.No.	Description	ALIGNMENT -1 (Open Pump house from foreshore of Srisailam)	ALIGNMENT – 2 (Underground Pump house from foreshore of Srisailam)
1	Land Use and Land Pattern	The land along the main conduit is partly barren and partly sandy and rocky.	The land along the main conduit is partly barren and partly sandy and rocky.
2	Forest Land	About 309.54 ha	About 205.481 ha
3	Major Advantages	-------	The forest land submergence is reduced from 309.5 to229.04 ha
			Muck generation is less.
			Less impact on Ambient Noise levels during operation.
4	Major disadvantages	More Deforestation	None
		Delay in obtaining clearances which might impact the project cost.	
5	Social Issues	Involves displacement	Involves displacement
6	Techno-economic Aspects	Open pump house	Underground pump house and marginally cost effective.
7	Conclusions	Even though this proposal is feasible in certain aspects the forest submergence is more in this alternative.	Alternative- 2 is environmentally superior because of less submergence of forest land than alternative -1.
			This proposal is technically feasible and economically viable.

The Cost estimates (tentative) for the above alternatives were prepared and the alternative with 5 lifts was found to be economical. The cost of project for utilizing flood water from Srisailam reservoir at the

rate of 1.5 TMC/day and 2.0TMC/day for 60 days was worked out to be Rs. 36,000 Crores and Rs. 41,240 Crores respectively.

1.29 MANPOWER REQUIREMENTS

Considering the project life cycle involving different components in different locations, no centralized congregation or influx of people is expected. Locally available manpower shall be utilized in the nearest place of work. During the peak period about 7000 Unskilled, Semi-Skilled & Skilled personnel will be deployed along the entire stretch of the project. Out of which, requirement of unskilled labour has been estimated as 4000, which can be hired from the surrounding areas of the project (if available) in order to avoid large scale congregation of outside labour. At any given point, the number of people on one work site shall not be more than 300 and will be spread over the entire stretch of project area.

1.30 WATER REQUIREMENT

The total quantity of water required during construction period is 2,700 KLD (2,300 KLD for construction purpose and 400 KLD for domestic purpose). Water requirement during construction stage will be met from groundwater. Necessary permission will be taken from the respected authority.

1.31 POWER REQUIREMENT AND SOURCE

The proposed capacity for the project is 2,944 MW in all the 5 stages of Pumping Stations. The Power consumption of the project is 4,366 million units per annum. As the project is basically a lift irrigation project there is no power production in this project. Required Power will be supplied by DISCOMS of Telangana.Powerrequirement during construction phase is 90MW per month (75MW for construction and 15MW for domestic requirement).

Power to various lift points is to be availed from the respective power supply authorities. In case of power failure, the power supply required for the lighting, temporary housing and site offices etc, will be met from the DG sets of adequate capacity. The total Fuel required for scheme is 1,03,833 MT.

1.32 CONSTRUCTION SCHEDULE

The project consisting of Reservoirs, tunnels, pump houses, excavation and lining of canals of all links and other structures such as super passages, aqueducts, drops, bridges etc. will be completed in 30 months from the date of signing agreement.

1.33 PROJECT COST ESTIMATE

The Unit wise cost of the project is mentioned in **Table 1.29. The** B.C. Ratio has been assessed as 1.25:1.

Table 1-29: Unit wise Cost

S. N.	Item	Phase	Cost (Rs. Crores)
1	UNIT - I: Head Works- Main Conduit System (Five Lifts)	I	40,515.98
2.	UNIT - III: Power to Pumping Stations	I	3,471.31
Phase-I (Unit -I +Unit-III)			**43987.29**
3	UNIT - II: Canal System Including Distributary Network	II	8069.03
Phase-II (Unit -II)			8069.03
Total			**52,056.31**

1.34 IDENTIFICATION, PREDICTION AND EVALUATION OF IMPACTS

1.34.1 Impacts on the Micro-Climate of the Area

Due to construction activities, there shall be temporary and nominal effect on the ambient temperature and humidity. The operation stage project may not create any impact on the meteorology and climatology of the area.

1.34.2 Change in Land use / Land Cover

1.34.2.1 Construction Phase

For construction of the main canal and distributary system about 13092 ha land will be acquired from private owners. The land use of patta land and revenue land (2698ha) under canal shall change permanently in water body and built-up area (Project Components)

1.34.2.2 Operational Phase

During the operation phase no change in land use is expected. Many of the redundant areas having no further usage will be brought under plantation.

1.34.3 Soil Erosion and Siltation

1.34.3.1 Construction Phase

Soil erosion due to excavation of different components of the project, construction of roads will accelerate soil erosion.

1.34.3.2 Operational Phase

Soil erosion due to project activities will not exist in the operation phase as the construction would be completed and landscape restoration work would also be implemented

1.34.4 Impact on Geology

The intensity of anticipated environmental impact on geology of the area will be weak and extent of anticipated impact will be local. No impact is anticipated on the geology of the area during the operation phase.

1.34.5 Impact on Hydrology

The project envisages lifting of 90TMC @1.50 TMC in about 60 days during the flood season from the fore shore of the Srisailam Reservoir project on Krishna River at Yellur village in Kollapur mandal of district Mahabubnagar. Therefore, the most obvious impact hydraulic impact shall be alteration of the downstream flow regime during the period the water from the reservoir shall be lifted for storing in reservoirs for drinking /industrial and irrigation purpose. The daily abstraction of water shall be about 656 cumecs during period of abstraction. The most common attribute of water abstraction shall be a decrease in the magnitude of flood peaks downstream of the dam.

Ground water recharge from implementation and operation of PRLIS system shall be due to seepage from reservoir, losses from canal system and field application. The total recharge due to project shall be 1291.02 MCM. Accounting for unavoidable natural discharge (10%), the net ground water recharge shall be 1161.92 MCM.

The rise in water table shall be minimum for Nalgonda district (0.03m/yr) and maximum for Mahabubnagar district (0.65m/yr). Therefore, necessary water management strategies, such as conjunctive use of surface and groundwater are necessary in these areas.

1.34.6 Environmental Degradation due to Labour Immigration

During the construction phase congregation of approximately 7000 workers is likely to take place in the project area, which will increase pressure on land and water resource. Conflict between the migrants and the local population may occur for employment. Labour engaged in construction activity will also move away once the project work is completed; therefore, no additional impact is expected.

1.34.7 Impacts on Air Environment

Temporary changes in air quality during construction phase are expected due to emission of hydrocarbons from vehicles and gases from blasting operations. The maximum predicted GLC due to excavation activities at the head reaches of Venkatadri Main Canal taking off from Venkatadri reservoir, High level canal taking off from Kurumurthyraya reservoir. Low Main Canal taking off Udanadapur reservoir and North Main Canal taking off from KP LakshmideviPally reservoir was found to be 14.97µg/m^3, 21.15µg/m^3,23.50µg/m^3 and 15.53µg/m^3 respectively. The resultant impact due to construction activities (excavation and crushing) on the Ambient air quality for PM10 at the Head reach of main canals and the nearest villages are within the NAAQS.

Due to increased transportation during construction phase at 25 m, predicted concentration for PM10 is 12.4 µg/m3, which reduces to 7.7 µg/m3, 3.4 µg/m3 and 1.4 µg/m3 at 50m, 150m and 500m respectively. Thus, the impact on the pollutant level (PM10) due to increased traffic due to transportation of mineral shall be minimal. The increased GLC in respect of NOx were insignificant being 0.13 µg/m3 up to 25m and 0.11 µg/m3 up to 50m and 0.10 µg/m3 up to 1km.

1.34.8 Impacts on Noise Environment

Temporary increase in noise levels are expected during construction phase only. The estimated noise levels including the background level at these receptors at different locations, due to running of construction machinery, shall be lesser than the standard values

1.34.9 Impacts due to Ground Vibration and Air -overpressure due to Blasting

Due to blasting, the resulting PPV shall be between 1.71 mm/sec to 3.68mm/s which shall be considerably lower than the limiting values 5.0 mm/sec for excitation frequency less than 8 Hz, in case of temporary structures. Predicted air over pressure due to blasting at Badua and Karapura shall range between 103.2 -109.8 dB (A) respectively and is lower than 120 dB (A).

1.34.10 Impacts on Water Environment

During the construction phase, the water environment of the waterbody due to proposed project shall be impaired due to increase in silt rate from the discharge coming out open air works, batching and crushing plants and from the foundation works. The leakage of POL and washings of workshop floors and washing of vehicle and equipment bring oil and grease with it and shall increase the concentration of oil and grease in water, if discharged into the river section. The impact shall be felt during construction with the slight increase in turbidity in the river/ water bodies despite resorting to de-siltation of silt laden discharge

coming from various excavation points, but the transparency of the water shall not be impaired to the extent that the available sunlight ceases to power the photosynthetic reactions. Apart from ground water recharge from the application of water in command area, quality of ground water will also improve in the entire area as the quality of surface water to be applied conforms to class "C" water as per IS:2296-1982.

In operation phase due to running of canals and application of water in fields in such area where water table is high, water logging and soil salinity development can occur due to heavy losses of water due to seepage from canals, distributaries and water courses

1.34.11 Impacts on Flora

It is evident from the study that from the project zone and influence zone of the proposed project none of tree species, shrub, herb or any climber or grass species are either vulnerable or endangered. Interestingly the vegetation composition of the project zone is also widely distributed in the influence zone in abundance and there will be no significant loss to the habitat. However, any loss of vegetation during the project activity period will be restored in due course of time. The floral abundance of the project area in post construction phase will increase by many folds as the plantation under green belt, restoration and landscaping will be completed.

1.34.12 Impacts on Fauna

As the project activity is not going to affect all the major habitats, there is little concern for these niche birds. There will be no alteration to the existing habitat of endangered and threatened species. There is also no wildlife sanctuary, national park and biosphere reserve near the project area. Increase in temporary stress levels of wildlife during construction phase due to noise, human interference and reduction in present habitat. Threat due to poaching might increase. Due to reservoir creation, there will be improvement in the habitat for mainly water birds, reptiles, mammals, amphibians and plankton and Improvement in food chain of some reptiles, birds and carnivorous mammals due to creation of reservoir and increase in humidity level.

1.34.13 Summary of Positive and Negative Impacts

1.34.13.1 The positive impacts

- Irrigation potential shall be created in area (4,97,976 ha)
- Better living Standards for famers of command area.
- Employment opportunities/to locals in project work and fisheries.
- Benefits to economy and commerce.
- Access to improved infrastructure facilities.
- Recreation and tourism potential may boost
- Improvement in environment through implementation of different plans.
- Command Area Development.
- Better opportunities for cattle rearing.
- Increase in groundwater level

1.34.13.2 The negative impacts

- Due to project 14,891 families shall be affected due to land acquisition for phase -II works

- The loss of agriculture land (13,092ha) and agriculture produce.
- Loss of livelihood and income.
- Likely decrease in agriculture and horticulture production due to air pollution
- Disturbance to the fauna of the study area during construction
- Pressure on the existing provincial / state road will increase.

2 OBJECTIVE AND METHODOLOGY

2.1 INTRODUCTION

The ecology is the scientific analysis and study of interactions among organisms and their environment. It is an interdisciplinary field that includes biology and Earth science. The biodiversity assessment and conservation discipline explore natural landscapes, species and ecosystems and acquires theories and practical methods in preserving environments and organisms. Biodiversity refers not only to endangered species but also to every organism, including microbes and fungi. Biodiversity assessment and conservation program increase awareness and understanding of how human life depends on preserving animal species and natural ecosystems.

2.2 OBJECTIVE OF THE STUDY

- To collect the baseline data for the study along with a description of the existing terrestrial, wetland and aquatic biodiversity.
- To assess the scheduled species (rare, endangered, critically endangered, endemic and vulnerable) in the proposed site.
- To identify the locations and features of ecological significance by reconnaissance survey.
- To identify the impacts of a proposed project before, after and during the development phases.
- To identify the livelihood dependency on NTFPs.
- To identify the phyto sociological study of flora.
- To assess the wildlife presence within the 10 km study area.

2.3 STUDY APPROACH

The study area of the proposed Palamuru-Rangareddy Lift Irrigation Scheme (PRLIS) project site reported with **Schedule-I species** in accordance to Wildlife (Protection) Act, 1972, which provide absolute protection to these **Schedule-I** species under the act and any offences under the act is prescribed the highest penalties & imprisonment.

A systematic study was conducted to assess the status in terms of movements and habitat use of the Schedule-I species reported/observed in the proposed PRLIS Site and its environs of 10 km radius.At first, a detailed biological survey of balancing dam sites, and Ayacut/command area (10 km radius from the study area) was carried out to understand the status distribution of the species in the study area. Further, survey was carried out to understand the recent status of these species sightings and their movements. Local inhabitants of nerest villages in 06 project Districts viz., Mahbubnagar, Nagarkarnool, Nalagonda, Rangareddy, Vikrabad and Narayanpet were also interviewed to understand the possible habitat, food and feeding habitat of these species in the study area.

2.4 METHODOLOGY FOR FAUNAL STUDY

- In order to study the wild mammals, avifauna, here to fauna and insects of the project area 2-5 km transect trails were carried out in the different locations. The study area was divided into different strata based on vegetation and topography. Sampling for habitat and animals was done in different

strata. As the normal systematic transects for mammals and birds were not possible in this study area due to difficult terrain, therefore mostly trails were used for faunal sampling.

- In addition to the field sampling secondary data and information was also collected as follows. The following secondary sources were refered for data collection:

  i. Birds of the Indian Subcontinent by R. Grimmett, C. Inskipp & T. Inskipp (Second Edittion,2014);
  ii. Salim Ali's Book of Indian Birds Indian Bird by Salim Ali (Thirteenth Revised Edition, 2002);
  iii. Bats of the Indian Subcontinent by Bates and Harrison (1997);
  iv. A Field Guide to Indian Mammals by Vivek Menon (2014);
  v. Scientific publications of Zoological Survey of India (Subsidiary Govt. organization under the control of Ministry of Environment and Climate Change (MoEF&CC), Govt. of India, New Delhi);
  vi. Scientific publications of Bombay Natural History Society (BNHS) and;
  vii. Scientific publications of Wildlife Institute of India (WII).

- Direct sighting and indirect evidences such as calls, signs and trophies of mammals were recorded along the survey routes taking aid from Prater (1980).

- Interviews of local villagers for the presence and relative abundance of various animal species within each locality.

2.5 DATA COLLECTION

The Baseline study for the existing ecological environment was carried out in a phased and constructive manner. Collection and generation of ecological data has been completed at two levels: Field Studies and Secondary data sources. Field Survey was conducted by a team comprised of terrestrial and aquatic ecologists during Monsoon (07th-28th August, 2019), Post-Monsoon (5th-24th November 2019) and Pre-Monsoon (22nd February-12th March 2020). The specific parameters covered as part of primary level surveys/field studies have been described in the following paragraphs

2.6 METHODOLOGY FOR FLORAL STUDY

The present study on the floral assessment for the project activity is based on field survey of the area. By the following forest inventory methodology; the survey of biological parameters has been conducted within the buffer zone (10 km radial distance) from study area in accordance with the guidelines issued by the Ministry of Environment, Forests and Climate Change, (MoEF&CC) during the study period. A preliminary survey of the study area has been performed to get a general picture of the landscapes in vegetation. Traverses have been taken within different zone of the study area to note major vegetation patterns and plant communities including their growth form and dominant species. A forest inventory is "an attempt to describe the quantity and quality of forest trees and many of the characteristics of the land area upon which the trees are grown." The objective this floral inventory of the study area, is to

provide complete checklist of floristic structure within the core zone and buffer zone (10 km radial distance) from project site for formulating effective management and conservation measures.

2.7 COLLECTION OF SECONDARY DATA

Secondary data is collected i.e., Compartment History prepared by the Forest Department, Working Plan of the Area other relevant records such as plantation journals and records of wild life / forest offence cases.

2.8 REVIEW / REFFERENCE OF RELEVANT LITERATURE/BOOKS

To complete this study the information from published books, materials and scientific literature is relied upon.

2.9 DATA SYNTHESIS AND RESULTS

The primary data collected from the field are subjected to standard statistical tests and species are identified with reference to published books and materials. The study revealed following status of the species i.e. flora and fauna in the given area.

3 STATUS OF FLORA AND FAUNA IN THE STUDY AREA

3.1 FLORA

3.2 Forest Types

The forests in the study area were classified into different forest type with the help of Forest Working Plan of Mahbubnagar, Rangareddy, Nagarkarnool, Vikrabad, Nalgonda and Narayanept Forest Divisions. Forest types of study area have been grouped into 5A/C3 Southern Dry Mix Deciduous Forest and 5A/C1b Dry Teak Forest. The same are discussed below:

Type (5A/C3) Southern Tropical Dry Mixed Deciduous Forest: This type of forest is attributed torelatively low rainfall and lower altitude. Many species growing in this forest type are common to the moist deciduous forests. The canopy is comparatively open allowing good percentage of grass and herb to grow. Species associated with this type include:

i. Top Canopy: *Tectona grandis, Madhuca indica, Anogeissus latifolia, Pterocarpus marsupium, Terminalia tomentosa, Dalbergia paniculata, Terminalia bellerica, Boswellia serrata*

ii. Middle Canopy: *Diospyros melanoxylon, Chloroxylon swietenia, Buchnania lanzan, Lannea coromandelica Lower Canopy: Albizia amara, Wrightia tinctoria, Alangium salvifolium, Emblica officinalis, Annona squamosa, Calophyllum inophyllum, Diospyros chloroxylon, Zizyphus glabrata*

iii. Ground flora: *Caesalpinia lacerans, Gymnosporia spinosa, Randia spinosa, Butea monosperma, Lantana camara, Cynodon dactylon, Cymbopogon martinii, Cymbopogon schoenanthus*

Type 6A/C2 Southern Tropical Dry Thorn Forest: This type of forest may represent open forest in which thorny and usually hardwood species predominates. The trees have short boles and low branching crowns. Their usual height is up to 8 meters. There is usually a mixture of relatively few species. There is an ill-defined second storey of smaller trees and large crowned shrubs. The vegetation is mostly spiny and often with xerophytic character, extending down to low shrub growth. There is usually a thin grass growth which may appear during the short rainy season but more or less the soil is bare and devoid of any grass growth. Climbers are few, showing xerophytic adaptations. Stunted trees of the dry deciduous forest occur throughout the forest, notable among them being Anogeissus latifolia and Soymida febrifuga. Species associated with this type include:

i. Top Canopy and Middle Canopy: *Lagerstroemia parviflora, Diospyros chloroxylon, Albizia amara, Acacia sundra, Chloroxylon swietenia,* etc.

ii. Lower Canopy: *Zizyphus, Maytenus senagalensis, Dodonea viscosa, Randia dumetorum, Lantana camera* and a few climbers are also present.

3.3 Taxonomic Diversity

During the surveys an inventory of different plant groups found in the study area was prepared. In the study area 57 species of plants were recorded. These include 32 trees, 12 shrubs, 13 species of herbs and climbers respectively.

32 tree species recorded in the study area belongs 22 families. The most dominant families representing the tree species in the study area were Fabaceae (06 species) followed by Combretaceae (04 species),

Myrtaceae and Lamiaceae (with 02 species equally) respectively. The other 18 families represent only 01 tree species each.

The 12 species recorded in the study area belongs to 08 families. Apocynaceae, Rubiaceae, Malvaceae and Lamiaceae were found to be the most dominant families with 02 species in each family.

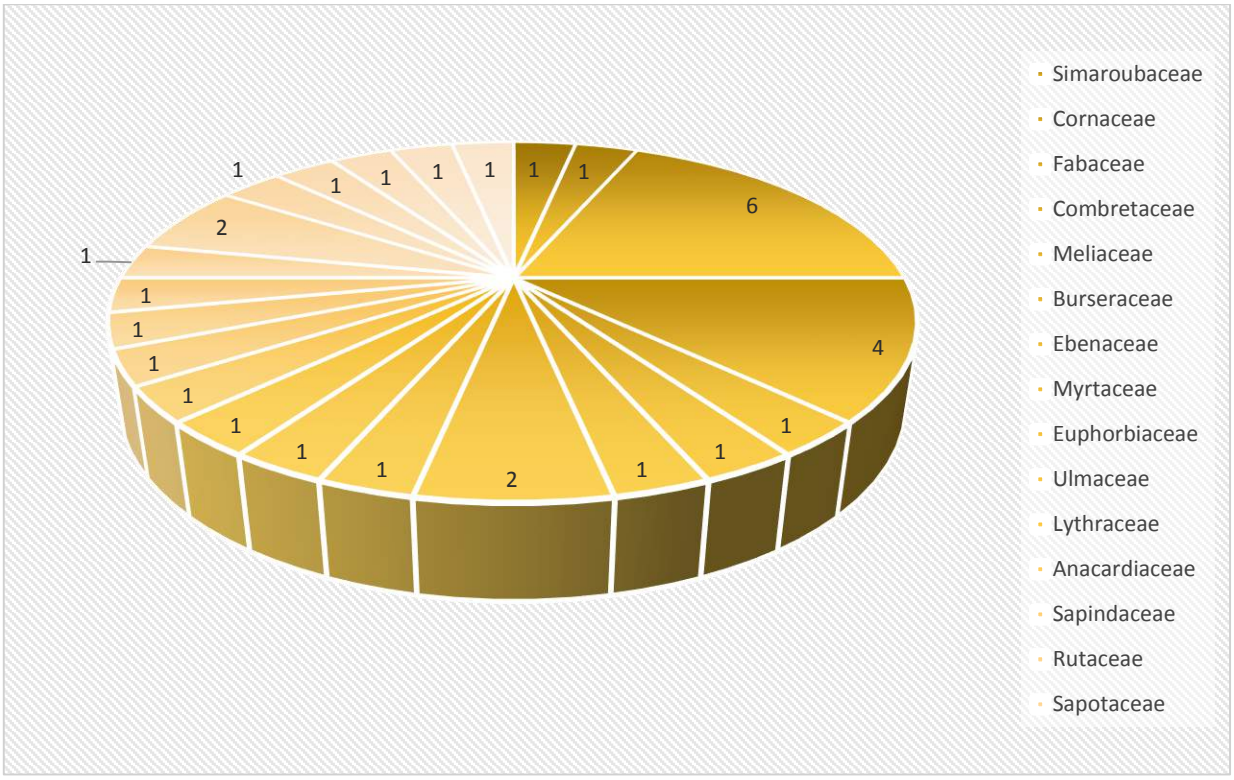
A total of 13 herbaceous species including herbs, grasses and climbers were recorded in the study area. The most dominant species were Poaceae with 03 species followed by Fabaceae with 02 species respectively. List of Plant Species (trees, shrubs & grasses) is given in **Table 3.1. Figure 3.1, Figure 3.2 and Figure 3.3** respectively depict the tree, shrub and herb diversity in the project area.

Table 3-1: Plant species recorded in the study area

S No	Local Name	*Botanical Name*	Family
Trees			
1.	Pedda Manu	*Ailanthus excelsa*	Simaroubaceae
2.	Udugu	*Alangium salviifolium*	Cornaceae
3.	Narlinga	*Albizia amara*	Fabaceae
4.	Thiruma	*Anogeissus latifolia*	Combretaceae
5.	Vepa	*Azadirachta indica*	Meliaceae
6.	Guggilamu	*Boswellia serrata*	Burseraceae
7.	Modugu	*Butea monosperma*	Fabaceae
8.	Rela	*Cassia fistula*	Fabaceae
9.	Getregi	*Dalbergia latifolia*	Fabaceae
10.	Pachari	*Dalbergia paniculata*	Fabaceae
11.	Tuniki	*Diospyros melanoxylon*	Ebenaceae
12.	Eucalyptus	*Eucalyptus globulus*	Myrtaceae
13.	Tellapoliki	*Givotia rottleriformis*	Euphorbiaceae
14.	Nemalinara	*Holoptelea integrifolia*	Ulmaceae
15.	Chennangi	*Lagerstroemia parviflora*	Lythraceae
16.	Gumpena	*Lannea coromandelica*	Anacardiaceae
17.	Korivi	*Lepisanthes tetraphylla*	Sapindaceae
18.	Velaga	*Limonia acidissima*	Rutaceae
19.	Ippa	*Madhuca longifolia*	Sapotaceae
20.	Botta Ganumu	*Mitragyna parvifolia*	Rubiaceae
21.	Naguru	*Premna tomentosa*	Lamiaceae
22.	Narepa	*Prioria pinnatum*	Fabaceae
23.	Chekkera	*Salvadora persica*	Salvadoraceae
24.	Musli	*Strychnos nux-vomica*	Loganiaceae
25.	Chilla	*Strychnos potatorum*	Loganiaceae
26.	Alla Neredu	*Syzygium cumini*	Myrtaceae
27.	Teku	*Tectona grandis*	Lamiaceae
28.	Erumaddi	*Terminalia arjuna*	Combretaceae
29.	Tanikaya	*Terminalia bellirica*	Combretaceae
30.	Asana	*Terminalia tomentosa*	Combretaceae
31.	Morlee	*Trema orientalis*	Cannabaceae

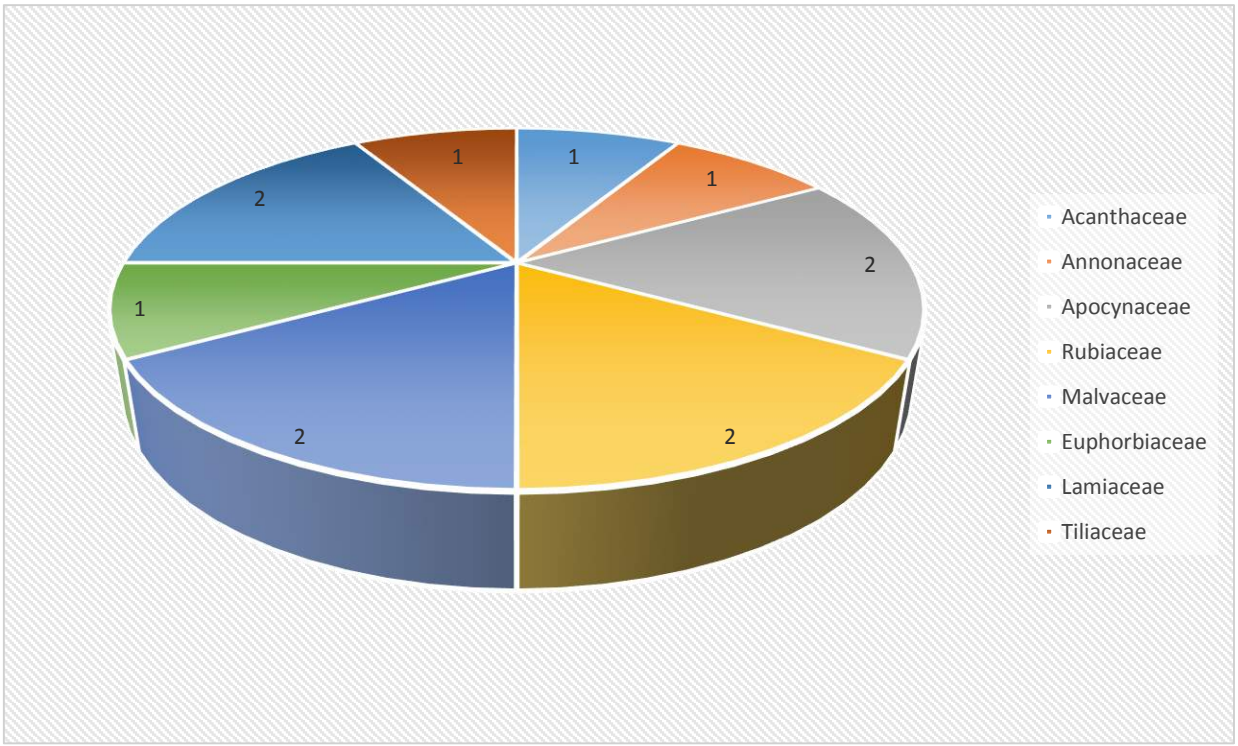
S No	Local Name	*Botanical Name*	Family
32.	Palakodisha	*Wrightia tinctoria*	Apocynaceae
Shrubs			
1.	Addarsham	*Adhatoda zeylanica*	Acanthaceae
2.	Seethaphalam	*Annona squamosa*	Annonaceae
3.	Jilledu	*Calotropis gigantea*	Apocynaceae
4.	Marrga	*Catunaregam spinosa*	Rubiaceae
5.	Jibilika	*Grewia hirsuta*	Malvaceae
6.	Vadampiri	*Helicteres isora*	Malvaceae
7.	Nepalam	*Jatropha curcas*	Euphorbiaceae
8.	Thulasi	*Ocimum tenuiflorum*	Lamiaceae
9.	Konda Papidi	*Tarenna asiatica*	Rubiaceae
10.	Bankitutthuri	*Triumfetta rotundifolia*	Tiliaceae
11.	Indhuvara	*Vitex negundo*	Lamiaceae
12.	Suganda	*Wrightia antidysenterica*	Apocynaceae
Herbs, Grasses or Climbers			
1.	Guriginja	*Abrus precatorius*	Fabaceae
2.	Adavi Draaksha	*Ampelocissus tomentosa*	Vitaceae
3.	Nelavemu	*Andrographis paniculata*	Acanthaceae
4.	Chandra Poda	*Argyreia sericea*	Convolvulaceae
5.	Cheepuru Gaddi	*Aristida setacea*	Poaceae
6.	Gadidagdapa	*Aristolochia bracteolata*	Aristolochiaceae
7.	Garike	*Cynodon dactylon*	Poaceae
8.	Adavinabhi	*Gloriosa superba*	Colchicaceae
9.	Kumeria	*Heteropogon contortus*	Poaceae
10.	Pilliadugu	*Mucuna pruriens*	Fabaceae
11.	Nelausiri	*Phyllanthus amarus*	Euphorbiaceae
12.	Niruboddi	*Rivea hypocrateriformis*	Convolvulaceae
13.	Palleru	*Tribulus terrestris*	Zygophyllaceae

**Source: field survey VSPL*



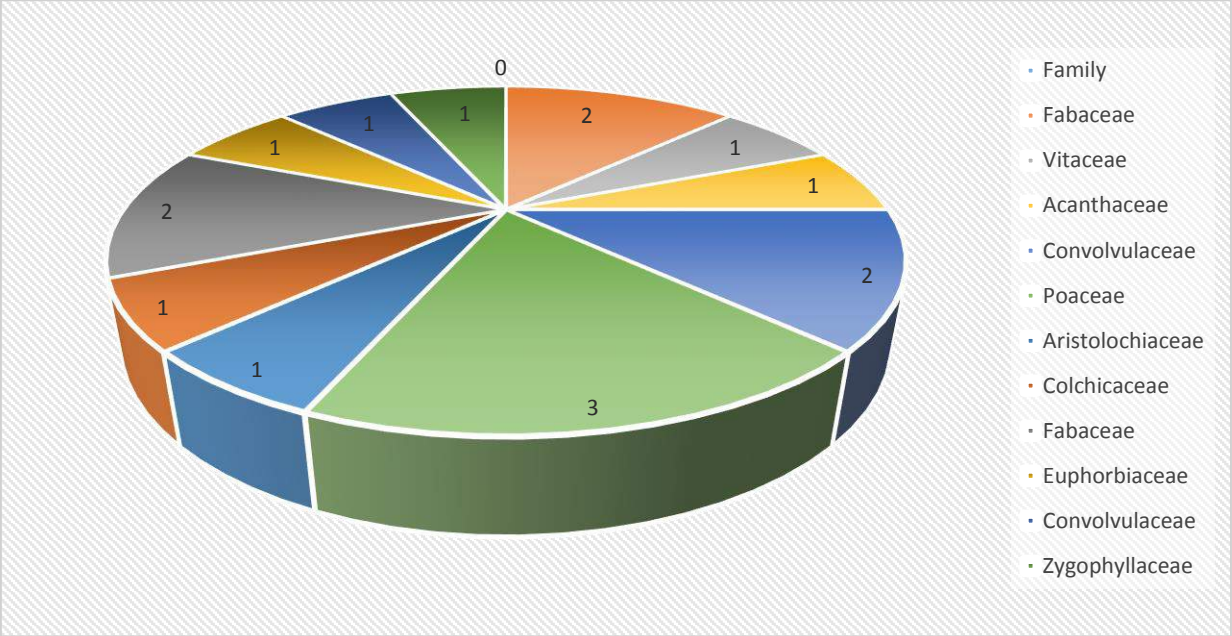
*Source: field survey VSPL

Figure 3-1: Diversity of Trees Species in the Study Area



*Source: field survey VSPL

Figure 3-2: Diversity of Shrub Species in the Study Area



Source: field survey VSPL

Figure 3-3: Diversity of Herbs and Grass species in the study area

3.3.1.1 Rare Threatened and Endangered Plant Species

None of the plant species reportedly found in the study area falls under any of the IUCN Red list of Threatened Species Version 2019.3. Majority of the species have been assessed by IUCN are under Least Concern category.

3.3.1.2 Economically Important Tree Species

During the field survey, numbers of plant species which are of economic importance in the area were recorded. These plants are used by local people for various purposes in their day-to-day life. These species include timber wood, fruits yielding trees, charcoal, firewood and tannin yielding trees etc. The information pertaining to the economic use of the locally found species was collected from knowledgeable and elderly persons from villages located in the study area and its environs. In addition, data and information on these plant species was also collected by consulting literature and relevant secondary sources.

About 14 economically important plant species were recorded from the study area. Plants of economic importance such as timber yielding (Teak-*Tectona grandis*) and Eucalyptus *(Eucalyptus globulus), (*Narlinga-*Albizia amara*), edible fruits yielding, Alla Neredu -*Syzygium cumini* were common in the study area. The names economically important recorded during the survey have been listed in **Table 3.2.**

Table 3-2: Economically Important Tree Species found in the Study Area

S No	Local Name	*Botanical Name*	Family	Economic Uses
Trees				
1.	Narlinga	*Albizia amara*	Fabaceae	Construction and furniture, and as a firewood.
2.	Thiruma	*Anogeissus latifolia*	Combretaceae	Dye & Tanning
3.	Modugu	*Butea monosperma*	Fabaceae	Dye & Natural Colors

S No	Local Name	*Botanical Name*	Family	Economic Uses
4.	Getregi	*Dalbergia latifolia*	Fabaceae	Foliage used as fodder. It yields a dark amber, strong flavored honey
5.	Tuniki	*Diospyros melanoxylon*	Ebenaceae	leaves are used for making beedis
6.	Eucalyptus	*Eucalyptus globulus*	Myrtaceae	Wood of Timber
7.	Tellapoliki	*Givotia rottleriformis*	Euphorbiaceae	high economic importance with wide applications
8.	Velaga	*Limonia acidissima*	Rutaceae	The fruit is used to make a fruit juice with astringent properties and jams. Ripe fruit can be used as "aachar"
9.	Ippa	*Madhuca longifolia*	Sapotaceae	The flower is edible and is a food item for tribal
10.	Botta Ganumu	*Mitragyna parvifolia*	Rubiaceae	Wood of Timber
11.	Chekkera	*Salvadora persica*	Salvadoraceae	charcoal and firewood
12.	Alla Neredu	*Syzygium cumini*	Myrtaceae	Edible fruits
13.	Teku	*Tectona grandis*	Lamiaceae	Wood of Timber
14.	Morlee	*Trema orientalis*	Cannabaceae	Charcoal and wood of timber

3.3.1.3 Plants of Ethno botanical/medicinal Importance

People living in the study area of this project use number of plants for medicinal/ethno-botanical purposes. They use these locally available plant species are used internally for treating diarrhea, dysentery, cough, cold, fever and asthma and externally for rheumatism, excessive bleeding, cuts, boils and injuries. A list of medicinal plants located in the project study area is given in **Table 3.45.**

Table 3-3: Commonly used medicinally important plant species

Sl. No.	Species	Family	Part Used	Aliment Cured
1.	*Abrus precatorius*	Fabaceae	Roots, Leaves	Cough & Cold
2.	*Aegle marmelos*	Rutaceae	Tender leaves, Fruits, pulp & bark	Diarrhea & dysentery
3.	*Annona squamosa*	Annonaceae	Seed Powder	Insecticides
4.	*Azadirachta indica*	Meliaceae	Bark, Leaves, Seeds	Abdominal pain, fever, diarrhea etc.
5.	*Butea monosperma*	Fabaceae	Seeds, flower, gum	Diarrhea
6.	*Calotropis gigantea*	Apocynaceae	Leaves, Latex, Roots	Headache, earache, boils, pain in arms and legs etc.
7.	*Cassia fistula*	Fabaceae	Tender leaves, Fruits, pulp & bark	Laxative Ringworm, intestinal worms in infants
8.	*Emblica officinalis*	Euphorbiaceae	Fruits	Anemia, Vomiting, general good health, hair growth
9.	*Gloriosa superba*	Colchicaceae	Tuber, seeds	Rheumatism
10.	*Ocimum tenuiflorum*	Lamiaceae	Leaves, Leaves Oil	Cough & Cold, Bronchitis
11.	*Oroxylum indicum*	Bignoniaceae	Root, Bark	Diarrhea, dysentery, sore back for cattle etc.
12.	*Phyllanthus amarus*	Euphorbiaceae	All Parts	Teeth Problems
13.	*Strychnos nux-vomica*	Loganiaceae	Wood Powder	Nervous disorder, ulcers wounds, fever etc.
14.	*Syzygium cumini*	Myrtaceae	Fruits	Vomiting, excessive menstruation

Sl. No.	Species	Family	Part Used	Aliment Cured
15.	*Terminalia arjuna*	Combretaceae	Bark	Urinary Tract Infection, hormonal imbalance, relieve bleeding conditions etc.
16.	*Terminalia bellirica*	Combretaceae	Bark	High cholesterol and digestive disorders, including both diarrhea and constipation, and indigestion.
17.	*Vitex negundo*	Lamiaceae	Leaf	Swelling

3.3.1.4 Community Structure

The community structures were studied through nested quadrats method. At each sampling location, one (01) quadrats of approximately 10 m x 10 m were laid out for sampling of the tree species, number of individuals of each species, falling within the quadrat was also noted. Names and number of shrubs were enumerated from nested quadrate of 5 m x 5 m.

Similarly, 1m×1m quadrat was laid for estimation of herbaceous species. Name of species of herbs, grasses, weeds and climbers were recorded from each quadrat.

In patches of forests trees like *Tectona grandis* and *Butea monosperma* can be seen along the proposed canalsystem. At places patches of some stunted smaller trees of *Syzygium cumini, Albizia* spp*., Cassia fistula* and *Terminalia* spp. are also seen. The understory vegetation is comprised of shrubs like *Calotropis gigantean, Vitex negundo, Jatropha curcas* and *Tarenna asiatica* etc. Commonly found herbaceous species are*Heteropogon contortus, Mucuna pruriens, Phyllanthus amarus, Rivea hypocrateriformis, Cynodon dactylon, Tibullus terrestris* and *Andrographis paniculata* etc.

3.3.1.5 Proposed Command Area

The sampling site is located in the planned command area. Among trees*Azadirachta indica, Albizia amara, Cassia fistula, Dalbergia latifolia, Dalbergia paniculata*and *Butea monosperma*are most dominant and frequently occurring species**.** Other trees such *Tectona grandis, Boswellia serrata, Ailanthus excels, Emblica officinalis, Trema orientalis*and Syzygium cuminietc.are also present in the study area in large areas. A total of 33 species recorded during the study period, all the 33 species were recorded during the post-monsoon, pre-monsoon and monsoon study **(Table 3.4).**

Shrub layer is comprised of the predominant species such as *Calotropis gigantean, Vitex negundo Jatropha curcas* and *Adhatoda zeylanica* followed by other commonly found species such as *Tarenna asiatica, Grewia hirsute* and *Helicteres isora* etc. A total of 12 species recorded during the study period **(Table 3.5).**

The herbaceous vegetation in the study area is predominated by various perennial grasses, herbs and climbers such as *Abrus precatorius, Ampelocissus tomentosa, Aristolochia bracteolate, Cynodon dactylon, Gloriosa superba, Heteropogon contortus* and *Tribulus terrestris* while few annual herbaceous vegetation such as *Phyllanthus amarus, Andrographis paniculata, Argyreia sericea* and *Aristida setacea* etc. can be easily found in the study area during monsoon season **(Table 3.6).**

Table 3-4: Community Structure for Overstorey Vegetation (Trees) in the Study Area

S. N	Local Name	Botanical Name	Family	Recorded during Post Monsoon	Recorded during Pre-Monsoon	Recorded during Monsoon
1.	Pedda Manu	*Ailanthus excelsa*	Simaroubaceae	√	√	√
2.	Udugu	*Alangium salviifolium*	Cornaceae	√	√	√
3.	Narlinga	*Albizia amara*	Fabaceae	√	√	√
4.	Thiruma	*Anogeissus latifolia*	Combretaceae	√	√	√
5.	Vepa	*Azadirachta indica*	Meliaceae	√	√	√
6.	Guggilamu	*Boswellia serrata*	Burseraceae	√	√	√
7.	Modugu	*Butea monosperma*	Fabaceae	√	√	√
8.	Rela	*Cassia fistula*	Fabaceae	√	√	√
9.	Getregi	*Dalbergia latifolia*	Fabaceae	√	√	√
10.	Pachari	*Dalbergia paniculata*	Fabaceae	√	√	√
11.	Tuniki	*Diospyros melanoxylon*	Ebenaceae	√	√	√
12.	Amla	*Emblica officinalis*	Euphorbiaceae	√	√	√
13.	Eucalyptus	*Eucalyptus globulus*	Myrtaceae	√	√	√
14.	Tellapoliki	*Givotia rottleriformis*	Euphorbiaceae	√	√	√
15.	Nemalinara	*Holoptelea integrifolia*	Ulmaceae	√	√	√
16.	Chennangi	*Lagerstroemia parviflora*	Lythraceae	√	√	√
17.	Gumpena	*Lannea coromandelica*	Anacardiaceae	√	√	√
18.	Korivi	*Lepisanthes tetraphylla*	Sapindaceae	√	√	√
19.	Velaga	*Limonia acidissima*	Rutaceae	√	√	√
20.	Ippa	*Madhuca longifolia*	Sapotaceae	√	√	√
21.	Botta Ganumu	*Mitragyna parvifolia*	Rubiaceae	√	√	√
22.	Naguru	*Premna tomentosa*	Lamiaceae	√	√	√
23.	Narepa	*Prioria pinnatum*	Fabaceae	√	√	√
24.	Chekkera	*Salvadora persica*	Salvadoraceae	√	√	√
25.	Musli	*Strychnos nux-vomica*	Loganiaceae	√	√	√
26.	Chilla	*Strychnos potatorum*	Loganiaceae	√	√	√
27.	Alla Neredu	*Syzygium cumini*	Myrtaceae	√	√	√
28.	Teku	*Tectona grandis*	Lamiaceae	√	√	√
29.	Erumaddi	*Terminalia arjuna*	Combretaceae	√	√	√
30.	Tanikaya	*Terminalia bellirica*	Combretaceae	√	√	√
31.	Asana	*Terminalia tomentosa*	Combretaceae	√	√	√
32.	Morlee	*Trema orientalis*	Cannabaceae	√	√	√
33.	Palakodisha	*Wrightia tinctoria*	Apocynaceae	√	√	√

Table 3-5 Community Structure for Shrubs in the Study area

S.No.	Common Name	Botanical Name	Family	Recorded during Post Monsoon	Recorded during Pre-Monsoon	Recorded during Monsoon
1.	Addarsham	*Adhatoda zeylanica*	Acanthaceae	√	√	√
2.	Seethaphalam	*Annona squamosa*	Annonaceae	√	√	√
3.	Jilledu	*Calotropis gigantea*	Apocynaceae	√	√	√
4.	Marrga	*Catunaregam spinosa*	Rubiaceae	√	√	√
5.	Jibilika	*Grewia hirsuta*	Malvaceae	√	√	√
6.	Vadampiri	*Helicteres isora*	Malvaceae	√	√	√
7.	Nepalam	*Jatropha curcas*	Euphorbiaceae	√	√	√
8.	Thulasi	*Ocimum tenuiflorum*	Lamiaceae	√	√	√
9.	Konda Papidi	*Tarenna asiatica*	Rubiaceae	√	√	√
10.	Bankitutthuri	*Triumfetta rotundifolia*	Tiliaceae	√	√	√
11.	Indhuvara	*Vitex negundo*	Lamiaceae	√	√	√
12.	Suganda	*Wrightia antidysenterica*	Apocynaceae	√	√	√

Table 3-6: Community Structure for Understory (Herbaceous vegetation) in the Study area

S.No.	Common Name	*Botanical Name*	Family	Recorded during Post Monsoon	Recorded during Pre-Monsoon	Recorded during Monsoon
1.	Guriginja	*Abrus precatorius*	Fabaceae	√	√	√
2.	Adavi Draaksha	*Ampelocissus tomentosa*	Vitaceae	√	√	√
3.	Nelavemu	*Andrographis paniculata*	Acanthaceae	×	×	√
4.	Chandra Poda	*Argyreia sericea*	Convolvulaceae	×	×	√
5.	Cheepuru Gaddi	*Aristida setacea*	Poaceae	×	×	√
6.	Gadidagdapa	*Aristolochia bracteolata*	Aristolochiaceae	√	√	√
7.	Garike	*Cynodon dactylon*	Poaceae	√	√	√
8.	Adavinabhi	*Gloriosa superba*	Colchicaceae	√	√	√
9.	Kumeria	*Heteropogon contortus*	Poaceae	√	√	√
10.	Pilliadugu	*Mucuna pruriens*	Fabaceae	×	√	√
11.	Nelausiri	*Phyllanthus amarus*	Euphorbiaceae	×	×	√
12.	Niruboddi	*Rivea hypocrateriformis*	Convolvulaceae	×	√	√
13.	Palleru	*Tribulus terrestris*	Zygophyllaceae	√	√	√

3.4 Terrestrial Fauna

The list of faunal species found in the study area has been compiled with the help of secondary sources like Forest Working Plans and was supplemented with information provided by local people during field surveys in the study area.

3.4.1.1 Mammals

To study the probable occurrence of mammals in the area, 2-3 km long transects and trails were walked at each sampling site for any sighting and also by collecting indirect evidence gathered by talking to locals during interaction. For compilation of list aid from Forest Working Plans was taken.

A list of 16 species of mammals reportedly found in the study area was compiled from secondary sources as well-found during survey and the same is given in **Table 3.7**.

Table 3-7: List of mammals reported from the study area with their conservation status

S. N.	Species	Common name	IUCN Red List Category	WPA, 1972 Schedule
1.	*Axis Synod*	Chital	LC	Sch III
2.	*Boselaphus tragocamelus*	Nilgai	LC	Sch III
3.	*Canis aureus*	Golden Jackal	LC	Sch II (Part I)
4.	***Canip lupus***	**Wolf**	**-**	**Sch I (Part I)**
5.	*Cervus unicolour*	Sambhar	-	Sch III
6.	*Cuon alpinus*	Wild dog	-	Sch II (Part I)
7.	*Felus chaus*	Jungle Cat	LC	Sch II (Part I)
8.	*Hyaena Felis*	Striped Hyaena	**NT**	Sch III
9.	*Lepus ruficandatus*	Indian Hare	LC	Sch IV
10.	*Macaca mulatta*	Rhesus macaque	LC	Sch II (Part I)
11.	*Mus booduga*	Little Indian Field Mouse	LC	Sch IV
12.	***Panthera pardus***	**Leopard**	**VU**	**Sch I (Part I)**
13.	*Semnopithecus entellus*	Monkey	**NT**	Sch II (Part I)
14.	*Rattus Rattus*	House Rat	LC	Sch V
15.	*Sus scrofa*	Wild Boar	**NT**	Sch III
16.	*Vulpes bengalensis*	Bengal Fox	LC	Sch II (Part I)

**Source: field survey VSPL and Secondary data from Forest Working Plan*

IUCN- International Union for Conservation of Nature; WPA – Wildlife (Protection) Act, 1972

VU – Vulnerable; NT- Near Threatened; LC - Least Concern

3.4.1.2 Avifauna

The avifaunal study was carried out in the study area during the Monsoon (August, 2019) & Winter (November, 2019), when birds from the central Asian countries visit different part of India and use it as a wintering ground followed by study in breeding & cropping season).

The techniques provided in Alfred and Ramakrishna (2004), Ghosh *et.al*. (1990) and Narawade *et al.* (2013) for general Faunistic survey were considered for the present investigation. Identification of avifauna species in the field was carried out with the help of the following field guides:

- Birds of the Indian Subcontinent by R. Grimmett, C. Inskipp & T. Inskipp (SecondEdittion,2014);
- Salim Ali's Book of Indian Birds Indian Bird by Salim Ali (Thirteenth Revised Edition, 2002);
- Bats of the Indian Subcontinent by Bates and Harrison (1997);
- A Field Guide to Indian Mammals by Vivek Menon (2014);
- Scientific publications of Zoological Survey of India (Subsidiary Govt. organization under the control of Ministry of Environment and Climate Change (MoEF&CC), Govt. of India, New Delhi);

- Scientific publications of Bombay Natural History Society (BNHS) and;
- Scientific publications of Wildlife Institute of India (WII).

Comet 10x50 DPSI power (Night vision) standard binocular was used to scan the area to spot bird-species and Cannon EOS 700D, 18-megapixel DSLR (Digital Single-Lens Reflex) Camera was used for taking pictures during the survey.

The avifaunal profile of the study area gives details of resident and migratory bird species having recorded ranges that include the study area.

Resident Avifauna

Resident bird species identified through primary survey with conservation status of the species are provided below in **Table 3.8.** The species sighted during the primary survey and that of conservation status as per the criteria mentioned above are also listed in separate column of the table and are typed in **Bold Font.**

Table 3-8: Resident Avifauna Recorded in the study area during the Study Period

S.No.	Zoological Name	Common name	Order	IUCN Red List Category*	WPA Schedule	CITES Status	CMS Appendix	Observation during Site Survey in Monsoon Season (August, 2019)	Observation during Site Survey in Winter Season (Feb-March-2020)
1.	*Acridotheres tristis*	Common Myna	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
2.	*Aegithina tiphia*	Common Iora	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
3.	*Ammomanes phoenicura*	Rufous-tailed Lark	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
4.	*Anthus rufulus*	Paddyfield Pipit	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
5.	*Ardeola grayii*	Indian Pond-heron	Pelecaniformes	LC	IV	--	--	**--**	**Recorded**
6.	*Argya malcolmi*	Large Grey Babbler	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
7.	*Athene brama*	Spotted Owlet	Strigiformes	LC	IV	**II**	--	--	**Recorded**
8.	*Bubulcus ibis*	Cattle Egret	Pelecaniformes	LC	IV	--	--	**Recorded**	**Recorded**
9.	*Centropus sinensis*	Greater Coucal	Cuculiformes	LC	--	--	--	**Recorded**	**Recorded**
10.	*Charadrius dubius*	Little Ringed Plover	Charadriiformes	LC	IV	--	**II**	**Recorded**	--
11.	*Cinnyris asiaticus*	Purple Sunbird	Passeriformes	LC	IV	--	--	**Recorded**	--
12.	*Cisticola juncidis*	Zitting Cisticola	Passeriformes	LC	--	--	--	**Recorded**	--
13.	*Columba livia*	Rock Dove	Columbiformes	LC	IV	--	--	**Recorded**	**Recorded**
14.	*Copsychus saularis*	Oriental Magpie-robin	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
15.	*Coracias benghalensis*	Indian Roller	Coraciiformes	LC	IV	--	--	**Recorded**	**Recorded**
16.	*Corvus splendens*	House Crow	Passeriformes	LC	V	--	--	--	**Recorded**
17.	*Dicaeum erythrorhynchos*	Pale-billed Flowerpecker	Passeriformes	LC	IV	--	--	**Recorded**	--
18.	*Dicrurus caerulescens*	White-bellied Drongo	Passeriformes	LC	IV	--	--	**Recorded**	--
19.	*Dicrurus macrocercus*	Black Drongo	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
20.	*Dumetia hyperythra*	Tawny-bellied Babbler	Passeriformes	LC	IV	--	--	**Recorded**	--
21.	*Egretta garzetta*	Little Egret	Pelecaniformes	LC	IV	--	--	**Recorded**	--
22.	*Elanus caeruleus*	Black-winged Kite	Accipitriformes	LC	IV	**II**	--	**Recorded**	**Recorded**
23.	*Eremopterix griseus*	Ashy-crowned Sparrow-lark	Passeriformes	LC	IV	--	--	**Recorded**	--

S.No.	Zoological Name	Common name	Order	IUCN Red List Category*	WPA Schedule	CITES Status	CMS Appendix	Observation during Site Survey in Monsoon Season (August, 2019)	Observation during Site Survey in Winter Season (Feb-March-2020)
24.	*Eudynamys scolopaceus*	Western Koel	Cuculiformes	LC	IV	--	--	**Recorded**	--
25.	*Francolinus pictus*	Painted Francolin	Galliformes	LC	IV	--	--	**Recorded**	--
26.	*Fulica atra*	Common Coot	Gruiformes	LC	IV	--	**II**	**Recorded**	**Recorded**
27.	*Geokichla citrina*	Orange-headed Thrush	Passeriformes	LC	--	--	--	**Recorded**	**Recorded**
28.	*Hierococcyx varius*	Common Hawk-cuckoo	Cuculiformes	LC	IV	--	--	**Recorded**	**Recorded**
29.	*Lanius vittatus*	Bay-backed Shrike	Passeriformes	LC	--	--	--	**Recorded**	--
30.	*Leptocoma zeylonica*	Purple-rumped Sunbird	Passeriformes	LC	IV	--	--	**Recorded**	--
31.	*Lonchura (Malacca) atricapilla*	Chestnut Munia	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
32.	*Merops philippinus*	Blue-tailed Bee-eater	Coraciiformes	LC	--	--	--	**Recorded**	**Recorded**
33.	*Microcarbo niger*	Little Cormorant	Suliformes	LC	IV	--	--	**Recorded**	**Recorded**
34.	*Motacilla maderaspatensis*	White-browed Wagtail	Passeriformes	LC	IV	--	--	--	**Recorded**
35.	*Passer domesticus*	House Sparrow	Passeriformes	LC	--	--	--	**Recorded**	**Recorded**
36.	***Pavo cristatus***	**Indian Peafowl**	**Galliformes**	**LC**	**I**	**--**	**--**	**Recorded**	**Recorded**
37.	*Perdicula asiatica*	Jungle Bush-quail	Galliformes	LC	IV	--	--	**Recorded**	--
38.	*Pericrocotus cinnamomeus*	Small Minivet	Passeriformes	LC	--	--	--	**Recorded**	**Recorded**
39.	*Ploceus philippinus*	Baya Weaver	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
40.	*Porphyrio porphyria*	Purple Swamphen	Gruiformes	LC	IV	--	--	**Recorded**	**Recorded**
41.	*Psittacula eupatria*	Alexandrine Parakeet	Psittaciformes	**NT**	IV	**II**	--	**Recorded**	--
42.	*Psittacula krameri*	Rose-ringed Parakeet	Psittaciformes	LC	IV	--	--	**Recorded**	**Recorded**
43.	*Pycnonotus cafer*	Red-vented Bulbul	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
44.	*Rhipidura aureola*	White-browed Fantail	Passeriformes	LC	--	--	--	**--**	**Recorded**
45.	*Saxicola caprata*	Pied Bushchat	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**
46.	*Saxicoloides fulicatus*	Indian Robin	Passeriformes	LC	IV	--	--	**Recorded**	**Recorded**

S.No.	Zoological Name	Common name	Order	IUCN Red List Category*	WPA Schedule	CITES Status	CMS Appendix	Observation during Site Survey in Monsoon Season (August, 2019)	Observation during Site Survey in Winter Season (Feb-March-2020)
47.	*Spilopelia senegalensis*	Laughing Dove	Columbiformes	LC	IV	--	--	**Recorded**	**Recorded**
48.	*Streptopelia decaocto*	Eurasian Collared-dove	Columbiformes	LC	IV	--	--	**Recorded**	--
49.	*Upupa epops*	Common Hoopoe	Bucerotiformes	LC	--	--	--	**--**	**Recorded**
50.	*Vanellus indicus*	Red-wattled Lapwing	Charadriiformes	LC	IV	--	--	**--**	**Recorded**

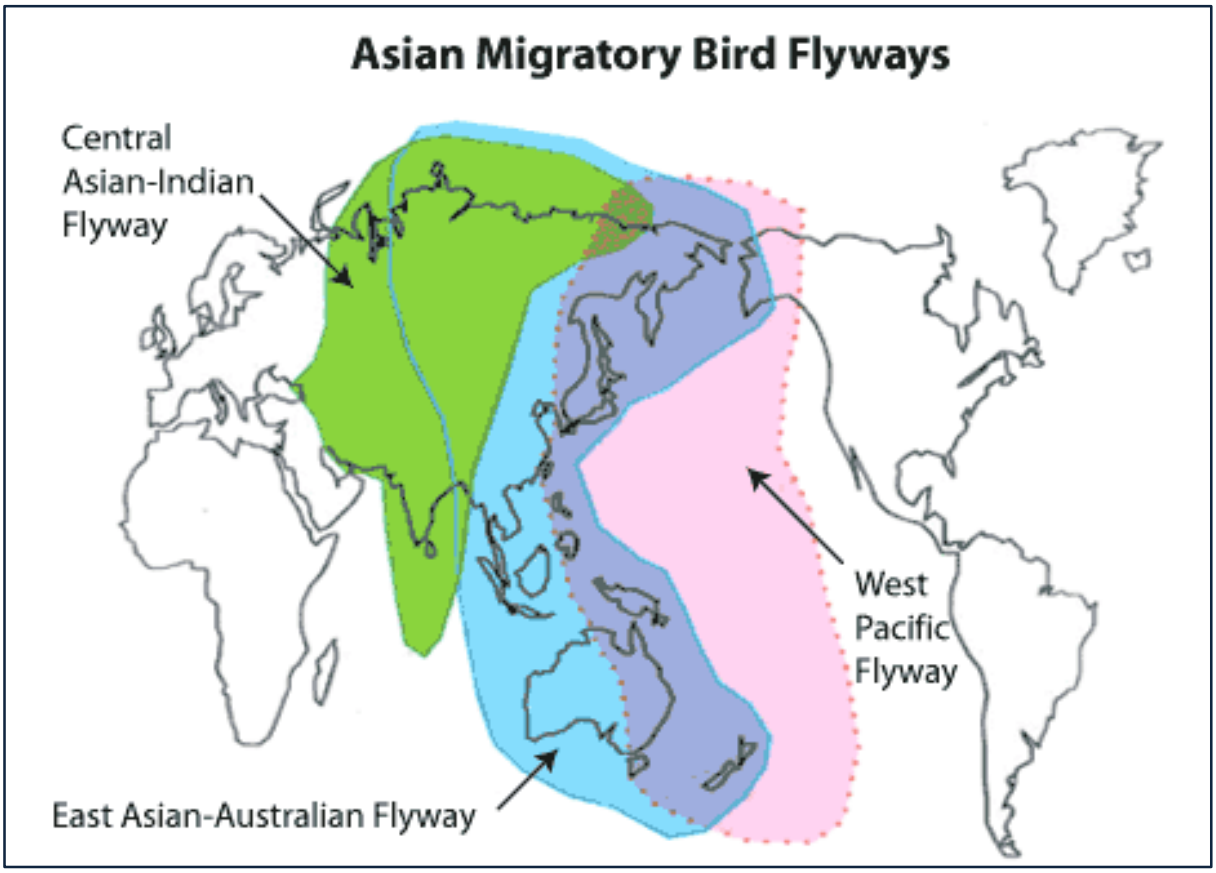
** Status assigned by the International Union for Conservation of Nature and Natural Resources, where - C – Least Concern; NT – Near Threatened;*
**Sources: R. Grimmett, C. Inskipp & T. Inskipp, Birds of the Indian Subcontinent; Salim Ali, Book of Indian Birds; IUCN Red Data List, https://www.cites.org/, www.cms.int/en/species Forest Working Plan Rangareddy, Nalgonda & and Mahbubnagar districts, 2003-2004.*

Migratory Bird Species

The migratory birds start visiting the wintering grounds in India from the month of September and stay till the month of March. The migration of the birds happens along nine certain migratory flyways globally. Three flyways overlap the Indian mainland and support high concentrations of migratory birds including several threatened species. Two of these flyways viz. Central Asian Flyway and West Asian-East African Flyway overlap each other in Kutch region of Gujarat state.

Central Asian Flyway

The Central Asian Flyway (CAF) as depicted in **Figure 5.4** covers huge area of Europe and Asia continents including the boundaries of 29 countries. It connects the breeding grounds in northern Russia and wintering grounds in the southern Asia. CAF supports about 307 species which also include several species that undertake regular, seasonal movements within the Indian subcontinent[1]. About 20 globally threatened and 10 Near Threatened (IUCN NT) species use this flyway for the annual movements.



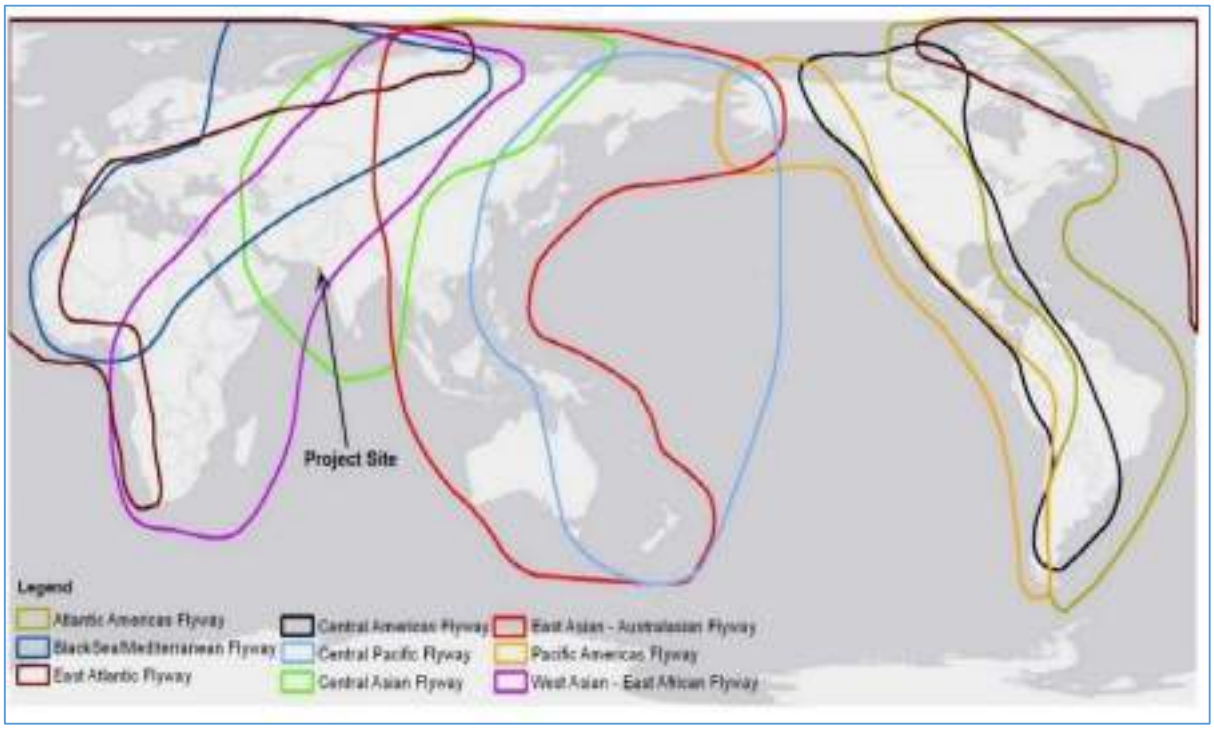
**Source: Birdlife International*

Figure 3.4: Asian Migratory Bird Flyways

[1] Birdlife International, Central Asian Flyway Factsheet

0.1.1.1 West Asian-East African Flyway

Through these routes many species of birds migrate annually between mid-Palearctic breeding grounds in Asia and non-breeding sites in eastern and southern Africa and overlaps the boundaries of 64 countries. It also supports the movement of about 20 globally threatened and 13 Near Threatened (IUCN NT) species.



**Source: Wetlands International*

Figure 3.5: Migratory flyways of the world

Thus, the study-area is very likely to be situated in the flight-path of the various winter, summer and passage visitor-birds migrating either to or through the region in which it is situated.

The Migratory bird species sighted during the primary field survey in the study area or water bodies in the command area/ayacut of the study area are listed in **Table 3.9.** The season of migration, the conservation status as per the criteria listed above is also detailed in **Table 3.9.** The species sighted during the field as well as recorded from the secondary sources are also listed in separate column of the Table and are typed in **Bold Letters.**

Table 3-9: Migratory Avifauna Recorded in the study area during the Study Period

S.No.	Zoological Name	Common name	Order	Migratory Status	IUCN Red List Category	WPA Schedule	CITES Status	CMS Appendix	Observation during Site Survey in Monsoon Season (August, 2019)	Observation during Site Survey in Winter Season (Feb-March, 2020)
1.	*Anthus godlewskii*	Blyth's Pipit	Passeriformes	Winter	LC	IV	--	--	--	**Recorded**
2.	*Merops orientalis*	Asian Green Bee-eater	Coraciiformes	Winter	LC	--	--	--	--	**Recorded**
3.	*Motacilla flava*	Western Yellow Wagtail	Passeriformes	Winter	LC	--	--	--	--	**Recorded**

***** *Status assigned by the International Union for Conservation of Nature and Natural Resources, where -**LC – Least Concern;***

*Sources: R. Grimmett, C. Inskipp & T. Inskipp, Birds of the Indian Subcontinent; Salim Ali, Book of Indian Birds; **IUCN Red Data List, https://www.cites.org/ , www.cms.int/en/species***

Forest Working Plan Mahbubnagar, Nagarkarnool, Nalagonda, Rangareddy, Vikrabad and Narayanpet

Figure 3.6 reveals that a total of 50 resident bird species recorded during both winter & monsoon seasons. Out of the 50 species, 35 resident bird species were recorded in the winter season whereas a total of 43 resident bird species were recorded during the monsoon season.

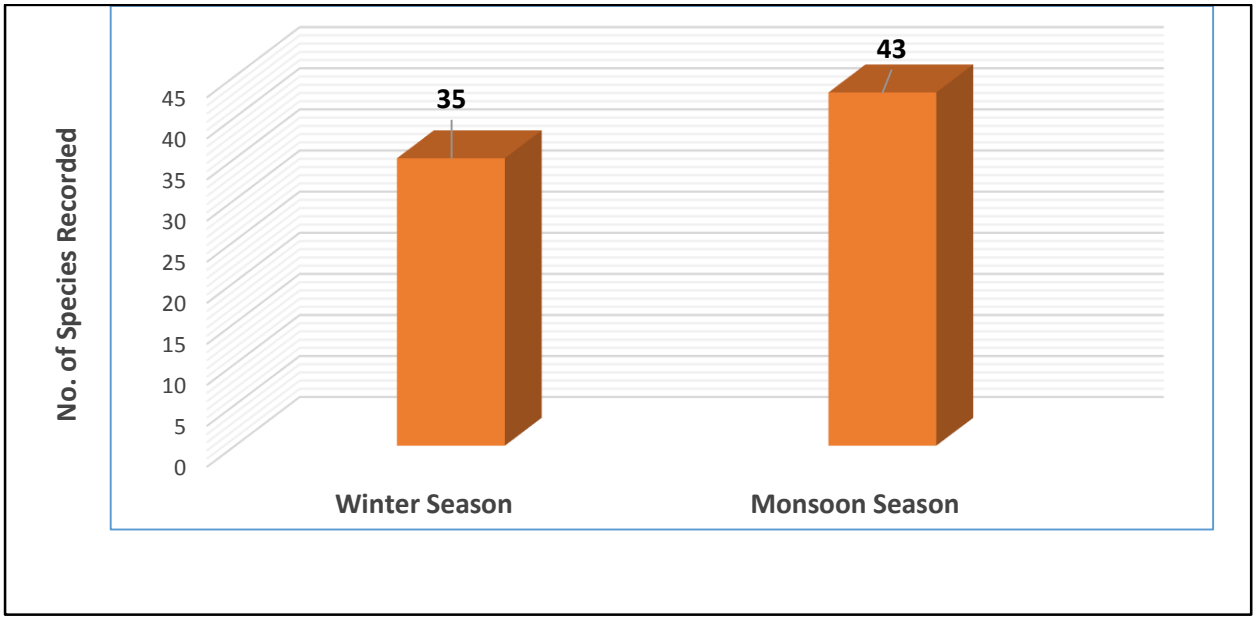


Figure 3-6: Number of Resident Bird Species recorded during Winter & Monsoon Seasons

Species diversity exhibits that the 35-bird species reported in the project study area during the winter season belongs to 13 orders with maximum 18 species (51%) from Order-Passeriformes as presented in **Figure 3.7.** Further, it is revealed that the 43 resident bird species recorded in the study area during the monsoon season belongs to 11 orders with maximum 23 species (53%) from Order-Passeriformes as presented in **Figure 3.8.**

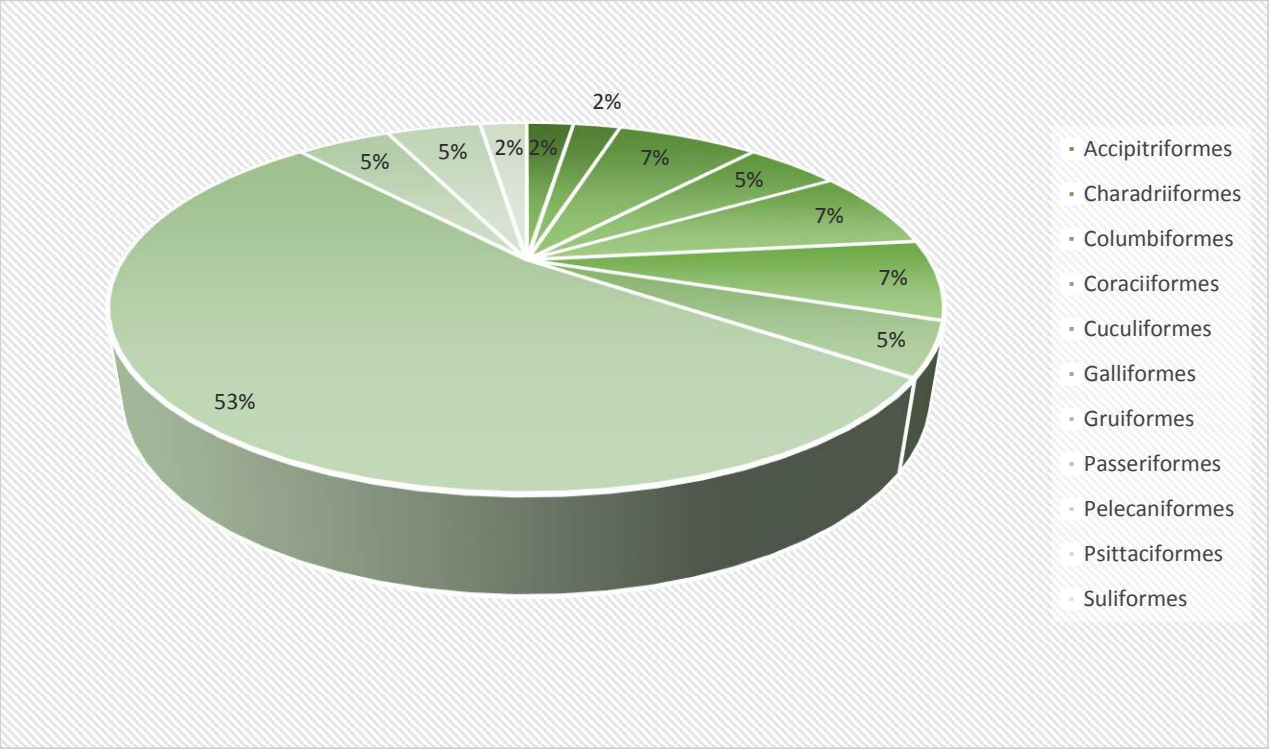


Figure 3-7: Bird Species Diversity of the Study Area during Monsoon Season (August, 2019)

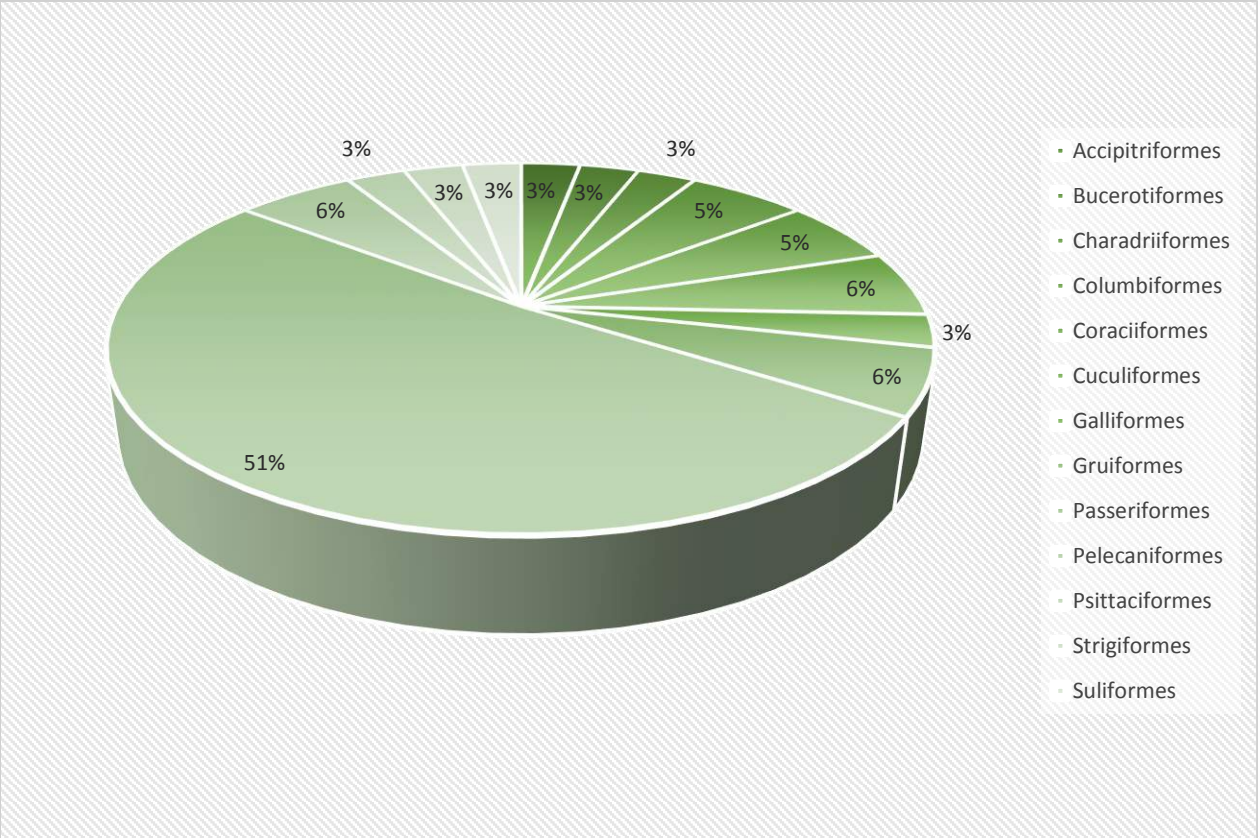


Figure 3-8: Bird Species Diversity of the Study Area during Winter Season (Feb-March, 2020)

3.4.1.3 Herpetofauna

Herpeto-fauna were sampled on the same transects marked for mammals and birds. The following species are recorded from the study area **(Table 3.10).**

Table 3-10: List of Herpetofauna Reported from the Study Area

Sl. No.	Species	Common Name	IUCN Red List Category	WPA, 1972 Schedule
1.	*Mellivora Capensis*	India Ratel	LC	--
2.	*Naja tripudians*	King Cobra	**VU**	**Sch II (Part II)**
3.	*Viper Russelli*	Viper	--	**Sch II (Part II)**
4.	*Ptyas mucosa*	Common Rat Snake	--	**Sch II (Part II)**
5.	*Rana hexadactyla*	Indian Pond Frog	LC	**Sch IV**

Source: Forest Working Plan Rangareddy, Nalgonda & and Mahbubnagar districts, 2003-2004.
IUCN- International Union for Conservation of Nature; WPA – Wildlife (Protection) Act, 1972
** Status assigned by the International Union for Conservation of Nature and Natural Resources, where - **LC – Least Concern, VU=Vulnerable, NT=Near Threatened***

3.4.1.4 Conservation Status of Fauna

As per IUCN Red list of Threatened Species of Version 2019.3 four mammalian species of vulnerable/near Threatened Category arereported from the study area. According to WPA (1972) also two (02) mammal species are listed in Schedule-I, and six (06) species are listed in Schedule-II.

The data exhibits that, out of 50 Resident Birds species recorded during the study period (monsoon & winterseasons) 06 species falls under species of conservation importance as per IUCN Red list category, Indian Wildlife (Protection) Act, 1972 (As amended up to, 2006), CITES APPENDIX: I, II and II and; CMS APPENDIX: II.

As estimated, among the 50 resident bird species recorded during the study period (winter & monsoon seasons) only 01 species (Alexandrine Parakeet-*Psittacula eupatria*) belong to "**Near Threatened"** category and the rest of 49 species belongs to **"Least Concern"** category in accordance to IUCN Red list category.

Further 01 species (Indian Peafowl-*Pavo cristatus*) belong to **Schedule I** category of Indian Wildlife (Protection) Act, 1972 (As amended up to, 2006).

Out of the 05 Herpetofauna recorded in the study area one (01) species is listed under vulnerable category of IUCN Red List. While two (03) species are reported as Schedule II species and three (01) specie is listed under Schedule IV of WPA, 1972.

4 CONSERVATION STATUS

4.1 BACKGROUND

The IUCN Red List is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the International Union for Conservation of Nature (IUCN) Red List is recognized as the most authoritative guide to the status of biological diversity. The Red list of threatened species, prepared by IUCN has listed 132 species of plants and animals as Critically Endangered (CR), the most threatened category, from India during its assessment in 2019 Ver-3. Plants seemed to be the most threatened life form with 60 species being listed as Critically Endangered (CR) and 141 as Endangered (EN). The Critically Endangered (CR) list included 18 species of amphibians, 14 fishes and 10 mammals. There are also 15 bird species in the category. The agency listed 310 species as endangered (EN) ones, including 69 fishes, 38 mammals and 32 amphibians.

Wild Life (Protection) Act, 1972, amended on 17thJanuary 2003, is an Act to provide for the protection of wild animals, birds and plants and for matters connected therewith or ancillary or incidental thereto with a view to ensuring the ecological and environmental security of the country. Some of the sighted fauna was given protection by the Indian Wild Life (Protection) Act, 1972 by including them in different schedules.

During the present survey a total of Three (03) Schedule-I Species including two (02) Mammalian species i.e. Indian Wolf (*Canis lupus pallipes)* & Leopard (*Panthera* pardus) and one (01) avifaunal species i.e. Indian Peafawl (*Pavo cristatus)* is reported/observed in the project study area and its environs (10 km raidus).

4.2 DECLINE OF WILDLIFE

Biological evolution on earth is associated with extinction of older species and descent of new species but the disappearance of species from the surface of the earth has speeded up 1000 to 10,000 times as compared to the natural disappearance, due to destructive activities of man. Important reasons for decline of wildlife are:

- Fragmentation, degradation and loss of habitat
- Hunting and poaching
- Man-animal conflict
- Pollution
- Climate change
- Overexploitation

4.3 OBJECTIVES OF CONSERVATION PLAN

- To prepare the list of flora and fauna of the proposed PRLIS HEP and its environs falling within 10 kilometre radius area from the project site and classification as per schedules of Wildlife Protection Act, 1972.
- To evaluate the ecological sensitivity of the area.
- To explore whether the area forms a corridor for any scheduled wildlife.
- To locate the Sanctuary, National Park, Bio-sphere reserve, Tiger/ Elephant reserve or notified Eco- sensitive zones falling in 10-kilometer radius area from the proposed site.
- To evaluate the possible threat of wildlife in the area and possible impact of mining on flora and fauna.
- To prepare a comprehensive Conservation Plan for the **schedule I** faunal species **(Table 4.1)**

4.4 MAMMALS AND AVIFAUNA OF THE PROJECT AREA (10 km radius) (Belonging to schedule I of Wildlife (Protection) Act, 1972.

Table 4.1: List of Schedule I species

S.No.	Common Name	Scientific name	Wildlife Schedule
Mammals			
1.	Indian Wolf	*Canis lupus pallipes*	Sch I (Part I)
2.	Common Leopard	*Panthera pardus*	Sch I (Part I)
3.	Tiger	*Panthera tigris*	Sch I (Part I)
4.	Smooth coated otter	Lutrogale perspicillata	Sch II (Part II)
Reptiles			
1.	Mugger Crocodile	Crocodylus palustris	Sch I (Part I)
Avifauna (Birds)			
1.	Peafowl	Pavo cristatus	Sch I (Part III)
2.	Long Billed Vulture/Indian Vulture	Gyps indicus	Sch I (Part III)
3.	Blackbuck	Antelope cervicapra	Sch I (Part I)

4.5 CONSERVATION STATUS OF MAMMALS

- **Indian Wolf (*Canis lupus pallipes*)**

- **Taxonomy**

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Carnivora	Canidae

- **Taxon Name: *Canis lupus pallipes***
- **Common Name(s)**
  English: Indian Wolf
- **Assessment Information**
- **Red List Category & Criteria: Not Evaluated**
- **Biology**

Wolves are placed in the family Canidae and the genera Canis includes species of wolves, jackals, and the domestic dog. The taxonomy and phylogeny of the wolves has been variously explained as including a single species C. lupus (Nowak 2009) or at most as two species with the second being C. rufus as suggested by Goldman (1937). Others consider C. rufus to be a subspecies of C. lupus (Lawrence and Bosssert 1967; Wozencraft 2005), or a modern hybrid of C. lupus and C. latrans, coyotes (Reich et al. 1999). At the sub-species level descriptions based on the variations in physical features, behavioral aspects and geographical distribution suggest the presence of up to 32 subspecies of Gray wolf globally, of which 10 extant subspecies are from Eurasia (Aggarwal et al., 2007). Two of these subspecies, the Tibetan wolf (Canis lupus chanco) whose range extends from the transHimalaya into Tibet and China, and the Indian wolf (Canis lupus pallipes) ranging over much of peninsular India inhabit the Indian subcontinent. Traditional taxonomy considers them as distinct relatives of other Gray wolves; however, recent molecular genetics studies contest this and suggest that the wolves from the Himalayas (Tibetan wolf, Canis lupus chanco) are the basal form that gave rise to the Indian wolf (*Canis lupus pallipes*). Further, the two are distinct enough to be treated as full species (Aggarwal et al., 2003). Sharma et al. (2004) suggested that wolf populations of Indian subcontinent have three divergent, ancient and parapatric mtDNA lineages; namely the Canis lupus pallipes clade (peninsular India, Iran, Iraq and parts of Arabia), Himalayan clade of Canis lupus chanco (Ladakh, Spiti, Tibet and Nepal) and the wolf-dog clade of Canis lupus chanco (northwest Jammu and Kashmir, i.e. Gilgit and Baltistan). The Indian wolf, Canis lupus pallipes possibly diverged from Grey wolf sub species (wolf-dog clade) about 400,000 years ago. Bardeleben et al. (2005) based on a combined analysis of nuclear and mitochondrial DNA suggested that the relationships among the wolflike canids remains poorly understood due to their recent divergence. Aggarwal et al. (2007) proposed the revision of the taxonomy of the wolves in India and proposed a new species Canis indica. Conclusive evidence that fully elucidates the taxonomy and phylogeny of the wolves remains to be fully explained and the studbook uses the taxonomy suggested by Nowak (2009).

- **Habitat Ecology**

The Indian wolf inhabits areas dominated by scrub, grasslands and semi-arid pastoral agro-ecosystems (Jhala 2013); however, in the eastern parts of its range extending across parts of Odisha, Bihar and West-Bengal they are known to inhabit moister low density forested habitats (Shahi 1982).

The availability of undisturbed patches that offer shade during the day and protection for whelping, denning and play areas for pups are crucial for habitat selection (Jhala 2013).

Indian wolves, similar to other sub-species of gray wolves are territorial animals with pack size, prey density and prey size being important determinants of home range size (Jhala, 2003). Wolves inhabiting areas supporting high prey densities have smaller territories, while those subsisting on livestock and scavenging have larger home ranges. Territory size of packs ranged between 150 and 300 sq. km (Jhala 2003, Habib 2007), whereas territories of lone male wolves were observed to range between 181 and 227.6 sq. km (Jethva 2002).

The small body size of Indian wolves allows them to sustain themselves on smaller ungulates, lagomorphs and rodents (Habib 2007) thus allowing solitary individuals to survive. Further, the shedding of under fur and behavioural thermoregulation by effective use of the limited shade available in the marginal habitats inhabited by them enables them to live in hot and arid regions (Jhala 2003).

Wolves are capable of hunting prey much larger than they are; this is achieved by hunting in packs, using different strategies like stalking and rushing or chasing. Additionally, the elongate cranium, with long jaws and powerful masseter muscles that are responsible for their powerful bite aid their predatory skills.

- **Social Organization and Behaviour**

Wolves are gregarious animals with a well-developed social system, with a family being a typical wolf pack (Mech 1970, 1999; Moehlman 1990, 1992). Adult parents guide activities of the group with a division-of-labor, the female plays a major role in pup rearing while the male is responsible for foraging and territory maintenance (Mech, 1999). The breeding or alpha male dominates all other wolves while the breeding female dominates all other wolves except the alpha male (Clark, 1971). The breeding male and female are responsible for territory (scent) marking (Rothman and Mech 1979). The breeding male though dominant at all other times is subordinate to a female with pups displaying submissive behavior, foraging food for her and the pups (Mech, 1999). The dominance hierarchy in wolves is thus

a reflection of the age, sex, and reproductive structure of the group. Single wolves exist in proximity to packs and may even share kills on certain occasions (Jhala, 2003).

- **Reproduction**

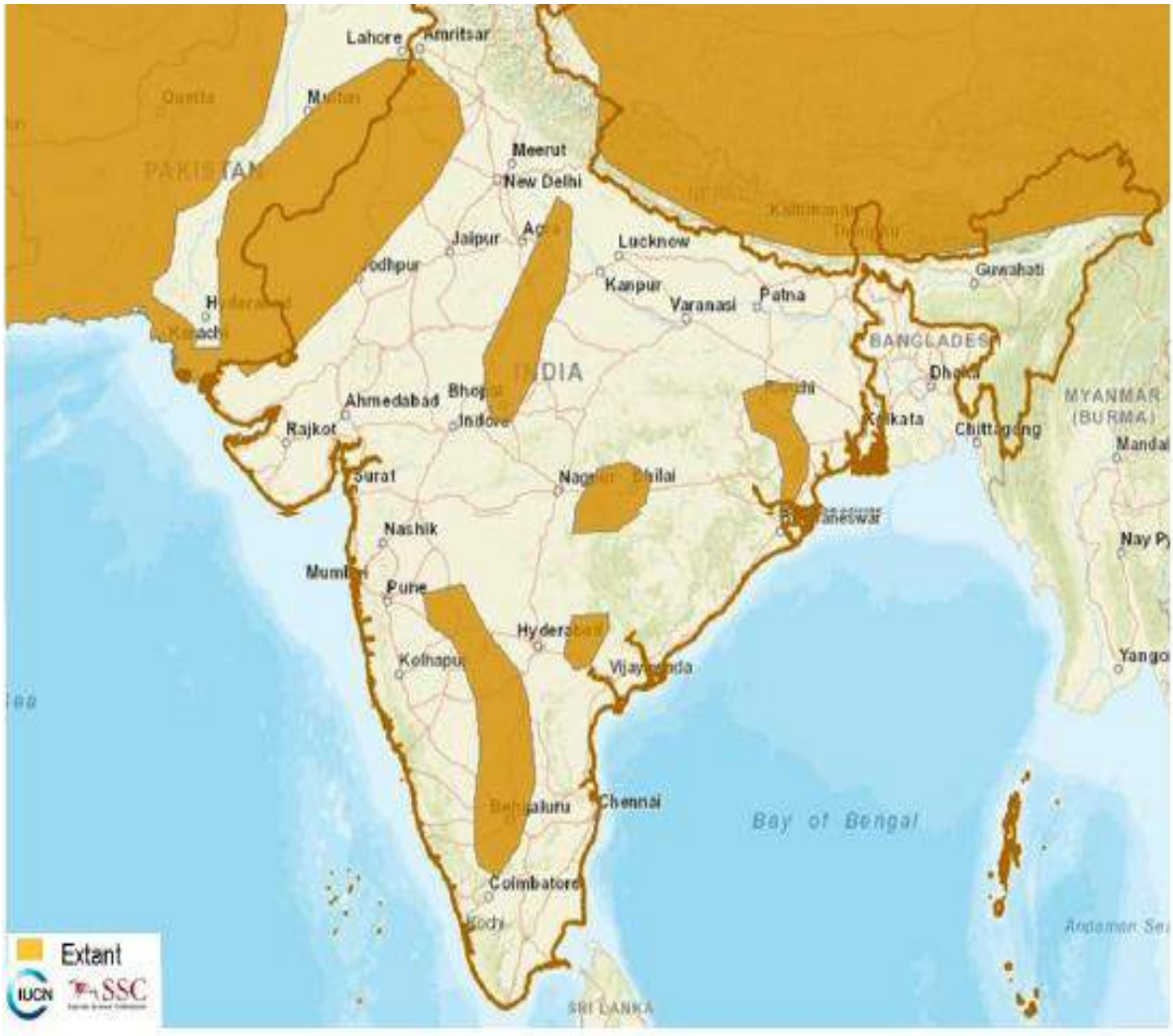
Indian wolves breed in winter, with mating occurring sometimes in October – November and is restricted to the dominant (alpha) pair of the pack (Jhala, 2003). After a courtship that can last from days to months, wolves copulate during an estrus period of 5 to 7 days (Mech 1974). The mating pair is locked in a copulatory tie that usually lasts for 20- 30 minutes (Sheldon 1992). The gestation lasts for 62-63 days and the breeding (alpha) female begins excavating a den 15 days to a month prior to whelping, with occasional assistance from the alpha male (Mech 1970). The mother confines herself to the vicinity of the den 5-7 days prior to birth and usually whelp 2 to 6 pups inside the den. Pups are born blind, developing blurred vision by the age of 15 days with most milk teeth are erupting by 3 weeks of age. Weaning takes place at about 5 weeks of age (Mech 1970). The female remains near the pups for at least 2 months, while the male and other pack members' hunt and feed both the female and the pups. Wolves in wild reach sexual maturity by 18 months of age and may disperse from their natal pack by this age.

- **Threats and Status**

A majority of wolf populations in India inhabit human dominated landscapes, outside the protected area network, subsisting primarily on livestock. (Jhala, 2003; Singh and Kumara, 2006; Habib 2007; Habib et al. 2013). Livestock depredation by them has resulted in a negative perception leading to retaliatory killing by pastoralists across their range, thus effectively limiting recruitment and survival of populations (Habib et al., 2013). Pathogens such as canine parvovirus (CPV), canine distemper virus (CDV) and canine adenovirus (CAV) that cause diseases in dogs (*Canis* familiaris) and sympatric wild canid species are an additional threat (Laurenson et al., 1998; Belsare et al., 2014). Jethva and Jhala, (2004) found a wide prevalence of rabies and canine distemper and reported rabies as the major source of mortality amongst adult Indian wolves, thereby exerting a further negative impact on populations

- **Distribution**

The subspecies *C. l. pallipes* has a wide distribution range, extending from India in the east to Turkey in the west, with populations reported from Pakistan, Iran, Iraq, Syria and Israel (Mendelssohn 1982, Shahi 1982, Mech and Boitani 2010). In India, they inhabit scrublands in three biogeographic zones that include the hot desert, the semiarid zone and the Deccan plateau (Jhala 2013). Jhala (2013) reports a presence of the subspecies in much larger areas that are contiguous in the three biogeographic zones as compared to Mech and Boitani (2010).



- **Common Leopard (*Panthera pardus*)**

- **Taxonomy**

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Carnivora	Felidae

- **Scientific Name: *Panthera pardus (* Linnaeus, 1758)**

  Synonym(s):

  - Felis pardus Linnaeus, 1758

  Regional Assessments:

- Mediterranean

Infra-specific Taxa Assessed:

- *Panthera pardus* ssp. delacouri
- *Panthera pardus* ssp. kotiya
- *Panthera pardus* ssp. melas
- *Panthera pardus* ssp. nimr
- *Panthera pardus* ssp. orientalis
- *Panthera pardus* ssp. saxicolor

Common Name(s):

- English: Leopard
- French: Léopard, Panthère
- Spanish; Castilian: Leopardo, Pantera
- Arabic: Al nimr

- **Assessment Information**
- **Red List Category & Criteria:** Vulnerable A2cd ver 3.1
- **Year Published: 2020**
- **Date Assessed: July 11, 2015**
- **Justification**

Leopards are widely distributed across Africa and Asia, but populations have become reduced and isolated, and they are now extirpated from large portions of their historic range. Due to their wide geographic range, secretive nature and habitat tolerance, Leopards are difficult to categorize as a single species. Evidence suggests that Leopard populations have been dramatically reduced due to continued persecution with increased human populations (Thorn et al.2013, Selvan et al.2014), habitat fragmentation (UN 2014), increased illegal wildlife trade (Datta et al.2008), excessive harvesting for ceremonial use of skins (G. Balme pers. comm. 2015), prey base declines (Hatton et al.2001, du Toit 2004, Fusari and Carpaneto 2006, Datta et al.2008, Lindsey et al.2014, Selvan et al.2014) and poorly managed trophy hunting (Balme et al.2009). Throughout North, East and West Africa, Middle East, East and South-east Asia, Leopards have suffered marked reductions and regional extirpations due to poaching for illegal wildlife trade, habitat loss and fragmentation, and prey loss. Human populations have increased by 2.57 percent annually from 1994 to 2014 (UN 2014) driving a 57% increase in the conversion of potential Leopard habitat to agricultural areas from 1975 to 2000 (Brink and Eva 2009). Deforestation in South-east Asia has increased for palm oil and rubber plantations (Sodhi et al.2010, Miettinen et al.2011). These factors were not incorporated in the previous assessment and likely have a substantial impact on suitable Leopard range.

Comparison of the extent of extant range presented in this assessment (8,515,935 km², see map) with that produced by Red List Assessors in 2007 (21,953,435 km²: Henschel et al.2008) yields a range reduction of 61%. However, the severity of this reduction is inaccurate due to previous insufficient sampling (the 2016 map is much more detailed in resolution, see Methodology in the Supplementary Material), and the reduction has likely occurred over a longer time scale. Though our knowledge of the Leopard distribution is better today than in 2008, it is still limited at the national, regional and rangewide scales because reliable data on Leopard population trends are missing from large portions of their range. We suspect, however, that at least half of the reduction translates to real and relatively recent range loss. Also in southern Africa, the so called stronghold of the Leopard, there is no evidence to suggest that Leopard populations have remained stable (G. Balme pers. comm. 2015). In Zimbabwe, much Leopard range has disappeared due to the resettlement of private farmland and subsequent loss of prey populations (du Toit 2004). We estimate regional range loss of approximately 21% in southern Africa. We suspect that suitable Leopard range has been reduced by >30% worldwide in the last three generations (22.3 years). We calculated generation length as 7.42 years (based on the formula presented in Pacifici et al. 2013 and data from wild Leopard populations presented in Balme et al. 2013).

Leopard population density across the species' range is known to track the biomass of principle Leopard prey species, medium-size and large wild herbivores (Marker and Dickman 2005, Hayward et al. 2007). Prey species are increasingly under threat from an unsustainable bushmeat trade, leading to collapses in prey populations across large parts of savanna Africa (Lindsey et al. 2013). A commercialized bushmeat trade has caused an estimated 59% average decline in Leopard prey populations across 78 protected areas in West, East and southern Africa between 1970 and 2005 (Craigie et al. 2010). Though ungulate populations have increased by 24% in southern Africa, potential prey numbers have declined by 52% in East Africa and 85% in West Africa (Craigie et al. 2010). Bushmeat poaching in Mozambique (Hatton et al. 2001, Fusari et al. 2006) and Zambia (Lindsey et al. 2014) has severely reduced Leopard prey (Becker et al. 2013) inside and outside of protected areas. Many wildlife areas are suffering from substantial ungulate decline, including Zambian Game Management Areas and National Parks, maintain large mammal populations at 93.7% and 74.1% below estimated carrying capacity, respectively (Lindsey et al. 2014). With such reductions to Leopard prey, we infer a >50% loss of Leopard populations across East and West Africa. Through extensive poaching pressure also in Asia many prey species, such as Sambar Deer in Malaysia, are threatened with regional extirpation throughout tropical forest systems (Corbett 2007, Kawanishi et al. 2014). In South-east and East Asia, poaching for Leopard prey and targeted Leopard hunts for the wildlife trade market are taking place. A regional survey found that Leopards in India have been poached at a rate of four individuals per week for the illegal wildlife trade (Raza et al. 2012b). Nowell and Pervushina (2012) found the illegal trade of Leopard parts was comparable to that of Tigers in Asian range States and derivative seizures with an average of 3.5 Leopards seizure cases per month in India since 2000. Preliminary data suggest that the illegal trade in Leopard skins for cultural regalia is rampant in southern Africa. It is suggested that 4,500-7,000 Leopards area harvested annually to fuel the demand for Leopards skins by followers of the Nazareth Babtist (Shembe) Church only (Balme unpub. data).

Poorly managed trophy hunting adds to pressure on local Leopard populations. Balme et al. (2009) showed that trophy hunting was a key driver of Leopard population decline prior to intervention in northern KwaZulu-Natal. Similarly, Pitman et al. (2015) demonstrated that Leopards are over-harvested across much of their range in Limpopo Province, South Africa. The concern about unsustainable trophy hunting has lately increased, e.g. South Africa has banned trophy hunting for 2016. This followed an alert by its CITES Scientific Authority that the number of Leopards in the country was unknown, and that trophy hunting posed a high risk to the survival of the species.

Taken all together, the Leopard meets the A2cd criterion for Vulnerable, based on loss of habitat and prey, and exploitation. These causes of the suspected reduction are not well understood, have not ceased, and are likely to continue, and future decline is anticipated unless conservation efforts are taken.

- **Previously Published Red List Assessments**

2019 – Vulnerable (VU)

https://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T15954A160698029.en

2016 – Vulnerable (VU)

https://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T15954A50659089.en

2008 – Near Threatened (NT)

https://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T15954A5329380.en

2002 – Least Concern (LC)

1996 – Lower Risk/least concern (LR/LC)

1990 – Threatened (T)

1988 – Threatened (T)

1986 – Vulnerable (V)

- **Geographic Range**

Range Description:

Our assessment of Leopard distribution has been divided into two geographic regions: Africa and Asia. In order to describe these regions, we have further divided Leopard distribution into sub-regions to address local population trends. A detailed discussion of the methodology used to produce the 2015 range map can be found in the Supplementary Material.

South and Central Asia:

There is some indication of its presence in the Babatag and Kugitang mountains of Uzbekistan (N. Marmazinskaya pers. comm. 2014). A confirmed record of Leopard was obtained in Afghanistan in the Bamyan province in 2011 in a camera trap image (Moheb and Bradfield 2014). In Pakistan, Leopards

also inhabits broken hilly or mountainous country throughout Waziristan, Baluchistan and Sindh Kohistan in association with acacia scrub forest (Roberts 1997). A recent study using DNA from scats found Leopard presence in northeast Pakistan from the Ayubia National Park (Shehzad et al. 2014). Leopards occur widely in the forests of Bhutan and Nepal. Leopards are widespread across India (Athreya et al.2013, Harihar et al.2009) and Sri Lanka (A. Kittle and A. Watson pers. comms. 2014) occurring inside and outside Protected Areas.

- **Country Occurrence**

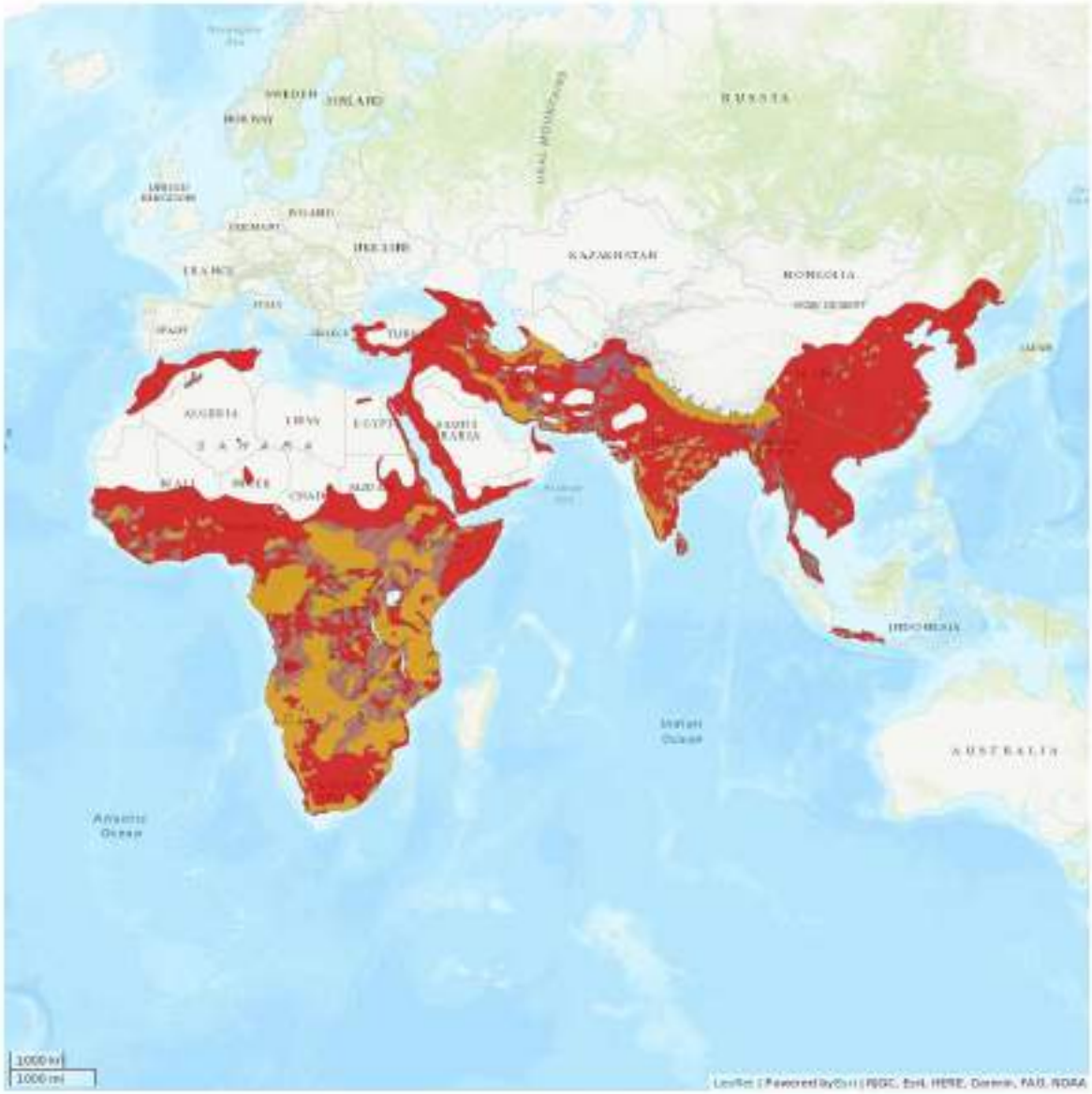
Native, Extant (resident): Afghanistan; Angola; Armenia; Azerbaijan; Bangladesh; Benin; Bhutan; Botswana; Burkina Faso; Burundi; Cambodia; Cameroon; Central African Republic; Chad; China; Congo; Congo, The Democratic Republic of the; Côte d'Ivoire; Djibouti; Egypt; Equatorial Guinea; Eritrea; Eswatini; Ethiopia; Gabon; Ghana; Guinea; Guinea-Bissau; **India;** Indonesia (Jawa); Iran, Islamic Republic of; Iraq; Kenya; Liberia; Malawi; Malaysia; Mali; Mozambique; Myanmar; Namibia; Nepal; Niger; Nigeria; Oman; Pakistan; Russian Federation; Rwanda; Saudi Arabia; Senegal; Sierra Leone; Somalia; South Africa; South Sudan; Sri Lanka; Sudan; Tanzania, United Republic of; Thailand; Turkey; Turkmenistan; Uganda; Yemen; Zambia; Zimbabwe

Native, Possibly Extinct: Gambia; Israel; Korea, Democratic People's Republic of; Lao People's Democratic Republic; Lesotho; Tajikistan; Viet Nam

Native, Extinct: Hong Kong; Jordan; Korea, Republic of; Kuwait; Lebanon; Mauritania; Morocco; Singapore; Syrian Arab Republic; Togo; Tunisia; United Arab Emirates; Uzbekistan Native, Presence

Uncertain: Algeria; Georgia

- **Distribution Map**



Legend
- EXTANT (RESIDENT)
- POSSIBLY EXTANT (RESIDENT)
- POSSIBLY EXTINCT
- EXTINCT

Compiled by:
Peter Gerngross 2019

- **Population**

Highly adaptable and widely distributed, Leopards can persist in areas where other large carnivores have been extirpated. However, Leopards are declining throughout most of their range (Jacobson et al.in review). There are no robust estimates of the total number of mature individuals range-wide, but several Asian subspecies were assessed as Endangered and Critically Endangered on The IUCN Red List in 2008 and should retain these listings in 2016 based on the following population estimates and a declining trend:

- Amur Leopard (P. p. orientalis) - Critically Endangered (CR C2 a (ii), D): <60 (Jackson and Nowell 2008, Sugimoto et al.2014, Xiao et al.2014).
- Arabian Leopard (P. p. nimr) - Critically Endangered (CR C2 a (i)): 45-200 (Mallon et al.2008).
- Javan Leopard (P. p. melas) - Critically Endangered (CR C2 a (i)): 350-525, with <250 mature breeding adults (Ario et al.2008).
- Sri Lankan Leopard (P. p. kotiya) - Endangered (EN C2 a (i)): 700-950 (Kittle and Watson 2015).
- Persian Leopard (P. p. saxicolor) - Endangered (EN C2 a (i)): 800-1,000 (Khorozyan 2008).

- **ASIA**

Indian Leopard (P. p. fusca): The known range of the Indian Leopard has increased compared to the previous assessment, but this is likely due to more intensive surveys conducted in previously unstudied wild and suburban environments. Poaching for wildlife trade is an increasing threat to Indian Leopards (Datta et al.2008). For example, Raza et al. (2012b) estimated that four Leopards per week have been poached for illegal wildlife trade over the previous 10 years. Additionally, high conflict is reported in some areas resulting in lethal control of problem individuals (Athreya et al.2013). Continuous decreases in wild prey are negatively impacting Leopard numbers in some regions (Datta et al.2008, Selvan et al. 2014), indicating Leopard populations may decline in the future. Moreover, even in well protected areas, the recovery of Tiger numbers often results in lower Leopard numbers (Harihar et al.2011, Mondal et al.2012), as Tigers are known to kill and displace Leopards (McDougal 1988, Odden et al.2010). The first ever scientific national census of Leopards around Tiger habitats in India (except the northeast) in 2014 estimated 7,910 individuals, with a speculated national total of 12,000-14,000 (Bhattacharya 2015). A full assessment is recommended for P. p. fusca, as it may potentially qualify as Vulnerable due to a suspected declining population containing fewer than 10,000 mature individuals.

- **Current Population Trend: Decreasing**
- **Habitat and Ecology**

Habitat Types and Range

Leopards occur in the widest range of habitats among any of the Old World Cats (Nowell and Jackson 1996). They are found in the desert and semi-desert regions of southern Africa in Namibia and Botswana. There are remnant populations in the arid regions of North Africa in Egypt, as well as the

Arabian Peninsula. They persist in rugged montane regions of southwest Asia in Iran, in a varied range of landscapes in India and in the savanna grasslands of East and southern Africa. Leopards live in mountainous environments up to an altitude of 4,600 m on Mt. Kenya and 5,200 m in the Himalayas. They also thrive in the rainforests of West and Central Africa as well as Sri Lanka and Southeast Asia. Aremnant Leopard subpopulation also persists in the snowy regions of the Russian Far-East. Leopard subpopulations also occur in suburban and urban environments in India and parts of sub-Saharan Africa. Leopards have survived outside protected areas in many parts of India since historical times (Daniel 1999) and even today high density of Leopards do occur among high human densities (Singh 2005, Athreya et al.2013), although associated levels of conflict can also be high (Athreya et al.2011). Occupancy survey found that Leopards occupied 174,066 km² of forest habitat in India (Jhalla et al. 2008). Despite widespread occurrence they are killed in very large numbers in India (Raza et al.2012b). Leopards prefer to hunt in areas that provide sufficient cover despite higher prey densities elsewhere when sympatric with larger competitors (Balme et al.2006).

Diet

Leopard diet is related to prey availability and presence of larger competitors. Generally, Leopards prefer medium-sized ungulate prey (10- 40 kgs) where available (Hayward et al.2006). They have a highly varied diet, however, feeding on insects, reptiles, birds and small mammals up to large ungulates.

Though the Leopard as a species has the reputation of being a generalist, often individuals will become adept specialists for a particular prey item. These individuals will feed almost exclusively on that prey, occasionally supplementing their diet with other food items when necessary. Where competitors are present Leopards will cache their kills under thick vegetation or hoist their prey into the limbs of a tree.

Hoisting behaviour is more often recorded where intraguild competitors' density is higher. Male Leopards tend to hoist more often than females, particularly in the dry season when available ground cover is scarce (Stein et al.in press). In the absence of larger competitors, leopards feed on larger prey (Ramakrishnan et al.1999, Hayward et al.2006). In many parts of its range, the importance of domestic animals in their diet is also evident with dogs, goats and cattle forming a large proportion of their diet (Mukherjee et al.2001) sometimes even dominating the prey items in the diet (Athreya et al.2014, Shehzad et al.2014). Dogs have been reported as important prey for Leopards (Edgaonkar and Chellam 2002, Athreya et al.2014). Overall studies on diet of Leopards are very scant across its Asian range.

Home Range Size

Leopard home range size varies with prey availability and habitat structure. Leopards have the largest ranges within arid and semi-arid environs where prey density is low. The largest recorded Leopard ranges include the Central Kalahari (mean = 2,182 km², Bothma et al.1997). The smallest recorded ranges correspond to rainforest habitats in south and Southeast Asia. In Thailand, Grassman (1999 recorded home ranges as small as 8.8 km² for a female and an average 17.7 km² for two adult males. In India three collared Leopards in human dominated landscapes exhibited home range sizes between 8 to 15 km² (Odden et al.2014).

Systems: *Terrestrial*

- **Use and Trade**

Leopards are targeted for trophy hunting and are illegally hunted for wildlife trade for their skins (used in traditional ceremonies), and bones and other parts (used for medicinal purposes in eastern cultures).

- **Threats**

The primary threats to Leopards are anthropogenic. Habitat fragmentation, reduced prey base and conflict with livestock and game farming have reduced Leopard populations throughout most of their range (Nowell and Jackson 1996, Ray et al.2005, Hunter et al.2013). The conversion of forest habitats and savanna systems to agriculture, livestock farming and urban sprawl have significantly reduced Leopard range. Though exceptions exist (Athreya et al.2013), this conversion typically leads to the depletion of natural prey species through poaching thereby reducing the natural prey base in these areas.

Where livestock and game farms have been created, Leopards may feed on these commercially valuable prey causing conflicts with farmers. These farmers may be intolerant to Leopard conflict and kill the Leopards for real or perceived threats to their lives and livelihoods (Stein et al.2010, Athreya et al. 2011). Recent reports from northern Iraq suggest unsustainable levels of Leopard removal (Raza et al. 2012b).

Leopards are also targets for trophy hunting. If poorly managed, trophy hunting can be detrimental to the population, especially when permits are focused in one geographic area and targeted individuals are in their prime, territorial, reproductively active (Balme et al.2010). Leopard trophy hunting has been reviewed or closed in Namibia, Botswana, and Zambia within the last five years.

In Indo-Malaya and China, Leopards require better protection from illegal trade in skins and bones (Nowell 2007) and recent reports estimate very high levels of Leopard removal at four individuals per week for 10 years (Raza et al.2012b). Leopards are also killed for their skins in traditional ceremonies and other parts for medicinal use in eastern cultures. These trades can have a substantial impact on local Leopard populations.

In the face of changing land-use, prey availability and direct mortality from humans, Leopards have persisted where other large predators have not. Their ability to live within human-dominated landscapes and feed on a variety of prey have given many people the impression that Leopards require little concern, however, recent trends have shown that current threats have substantially reduced Leopard populations throughout West and Central Africa, South-west and South-east Asia and China.

- **Conservation Actions**

The Leopard is included in CITES Appendix I. Trade of Leopard skins and products is restricted to 2,560 individuals in 11 countries in sub-Saharan Africa. Recently, the practices within the hunting industry have been called into question by wildlife researchers and conservationists (Packer et al.2011). In 2010, the government of Namibia conducted an assessment of trophy hunting in response to calls for an increase in permits amid reports of unethical hunting practices. Zambia placed a moratorium on Leopard and Lion hunting in 2013 due to concerns about the conservation status of the populations. In South Africa, Mozambique and Botswana, researchers have developed regional studies of the hunting quota systems that incorporate measures of trophy quality and regulate the geographic distribution of permits. These quota studies integrate previous hunting data to prescribe the number and distribution of hunting permits with local stakeholder participation. In 2014, sport hunting has been banned altogether in Botswana while South Africa suspended trophy hunting of Leopards for the year in 2016.

Regulating trophy hunting will only address a percentage of Leopard mortality; Human-Leopard conflict within livestock and game farming communities is likely the greatest source. In many countries of subSaharan Africa, farmers are allowed to kill predators that are considered a threat to life and property with permits distributed retroactively. It is likely that a high percentage of Leopards are killed without reporting and therefore the exact numbers of Leopards killed through actual or perceived conflict is unknown. Generally, efforts to calculate mortality through human-wildlife conflict have been considered unreliable. Since the majority of Leopard range is outside of protected areas, conflict mitigation strategies such as livestock husbandry, compensation/ insurance programmes, alterations in trophy hunting permit distribution and public awareness have all been used to assist farmers and increasing tolerance for living with leopards (Balme et al.2009, Stein et al.2010). Where conflict Leopards have been identified, translocation has been tried often with negative results (Weilenmann et al.2010, Athreya et al.2011), however, effective translocation criteria have been developed based on suitable release site characteristics (Weise et al.2015). Namibia and Botswana have promoted wildlife conservation through the devolution of wildlife management and the establishment of benefit sharing initiatives between photographic tour operators, professional hunters and communities through Conservancies and Wildlife Management Areas (WMAs; Jones 1993). These initiatives were modelled after previous efforts such as CAMPFIRE in Zimbabwe.

In North and West Africa, the Middle East and large parts of Asia, Leopards are restricted to protected areas where they are afforded refuge if poaching is not significant. However, many of these protected areas are not large enough to maintain genetically viable populations and will likely require intensive management. In Indo-Malayasia and China, Leopards require increased protection from illegal trade in skins and bones (Nowell 2007). In 2009, Leopards were protected from all hunting and trading within Afghanistan on the country's Protected Species List (Zahler pers. comm. 2014).

Since the previous status update, researchers have undertaken population surveys within protected areas throughout Leopard range. These surveys have improved our understanding of Leopard status

with greater resolution and in some cases generated population estimates. We recommend increased population surveys for Leopards, in particular across Central Africa, Angola, South-east Asia and China. To address the use of Leopard skins for traditional ceremonies, conservationists in South Africa have partnered with textile companies and communities to provide faux-fur alternatives (G. Balme pers. comm. 2014).

Leopard population recovery efforts are currently under way with reintroduction projects in Sochi, Greater Caucasus and the Russian Far East (C. Breitenmoser pers. comm. 2015).

- **Tiger (Panthera Tigris)**

- **Taxonomy**

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Carnivora	Felidae

- **Taxon Name** *Panthera tigris ssp. tigris* (Linnaeus, 1758)
- **Common Name(s)**
  - English: Bengal Tiger
- **Taxonomic Notes:**

The Bengal Tiger probably arrived in the Indian subcontinent approximately 12,000 years ago. It occurs in India, Nepal, Bhutan and Bangladesh (Luo et al. 2004)

- **Assessment Information**
- **Red List Category & Criteria:** Endangered A2bcd+4bcd; C1+2a(i) 3.1
- **Year Published:** 2011
- **Date Assessed:** February 12, 2010
- **Justification for Least Concern:**

Most Bengal Tigers are found in India, which has recently revamped its national tiger census methodology to be more scientific, extrapolating site-specific densities derived from camera trap and sign surveys using GIS. The 2010 survey resulted in an estimated population of 1,706 (1,520–1,909) (Jhala et al. 2011), an increase from 1,411 in 2006 (Jhala et al. 2008). The increase is in part due to inclusion of new areas in the most recent survey (Sunderbans, some portions of North East and parts of Maharashtra), but tiger densities were found to have increased in areas of Uttarakhand, Tamil

Nadu, Maharashtra and Karnataka. However, the survey found a decrease in tiger range of 12.6% in connecting habitat corridors from 2006–2010 (Jhala et al. 2011).

Other Bengal Tiger population estimates from national governments for the Global Tiger Recovery Program include Bangladesh (440), Nepal (155) and Bhutan (75). The total subspecies population is estimated at fewer than 2,500 tigers (2,376). No subpopulation is larger than 250. There has been a continuing decline over the past three tiger generations (20–30 years). The previous national India tiger census result of 3,642 in 2001–2002 cannot be directly compared to more recent surveys, as a different and somewhat discredited methodology was employed (attempting to identify individual tigers on the basis of unique pugmarks, or tracks). Nonetheless, a substantial decline in India's Tiger population is suggested.

Sanderson et al. (2006) built upon previous work by Dinerstein et al. (1997) to map priority landscapes for tigers (Tiger Conservation Landscapes). The Tiger's extent of occupied area is estimated at less than 1,184,911 km² (Sanderson et al. 2006), a 41% decline from the area estimated by Dinerstein et al. (1997). India suffered the most range contraction. While part of the difference is due to improved dataafter a decade of intensive tiger conservation efforts, and improved datasets and techniques, biologists consider the primary cause to be declines due to poaching and habitat loss (Dinerstein et al. 2007). Range decline is considered a strong indicator of population decline (Dinerstein et al. 2007). Because an average of 55% of Tiger Conservation Landscapes consist of non-tiger habitat (Sanderson et al. 2006), the declines in population and area of occupancy are greater than the 41% estimated, and thus likely indicate a 50% or greater reduction. A similar reduction could be expected over the next three tiger generations (20–30 years) unless conservation effort becomes more effective.

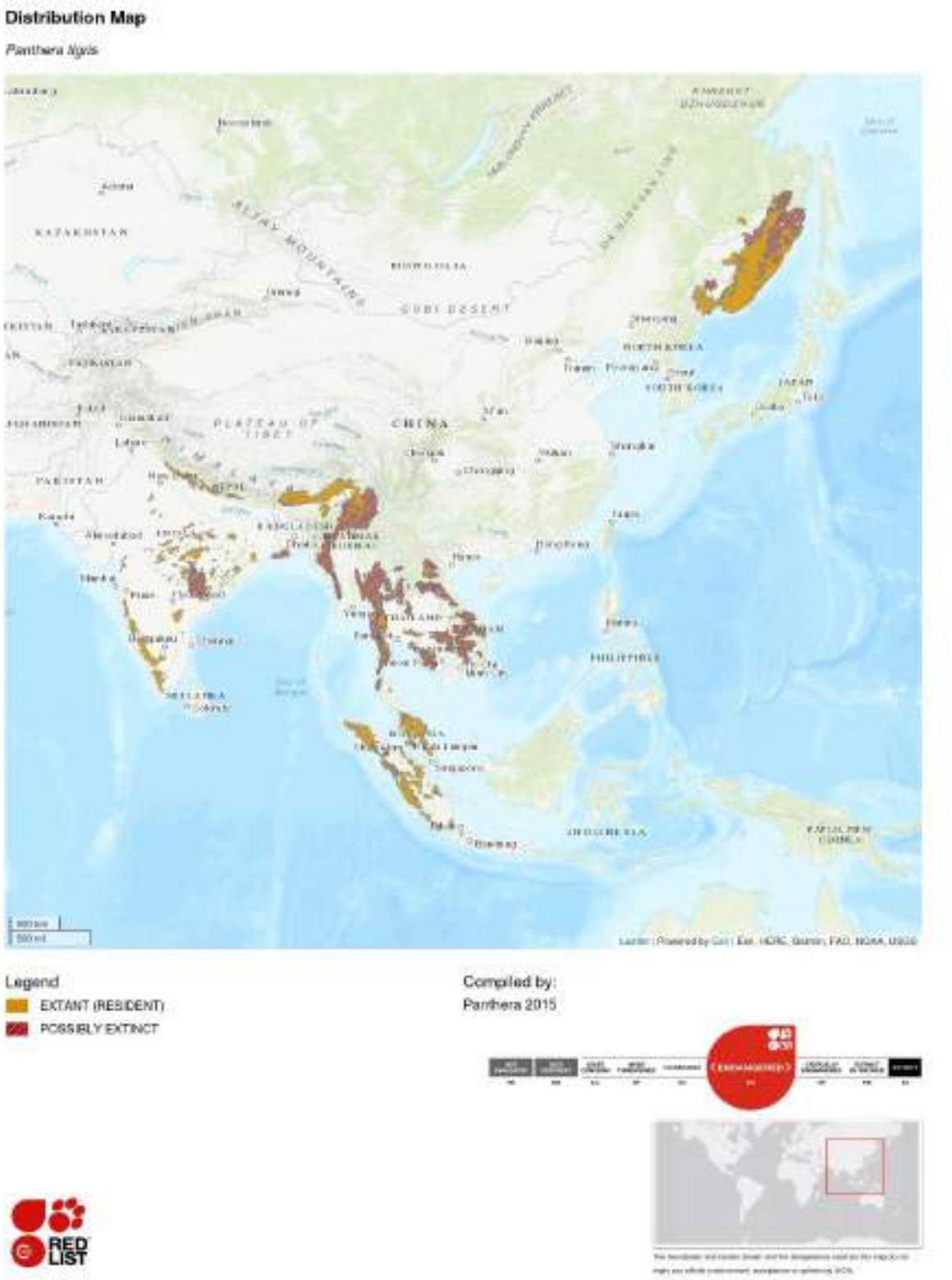
- **Previously Published Red List Assessments**

2010 – Endangered (EN)

2008 – Endangered (EN)

2008 – Endangered (EN)

- **Distribution Map**



- **Smooth coated otter (Lutrogale perspicillata)**

- **Taxonomy**

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Carnivora	Mustelide

- **Taxon Name** Lutrogale perspicillata (I. Geoffroy Saint-Hilaire, 1826)
- **Synonym(s):**

Lutra perspicillata

- **Common Name(s)**

English: Smooth-coated Otter, Indian Smooth-coated Otter

French: Loutre d'Asie

Spanish: Nutria Lisa, Nutria Simung

- **Taxonomic Notes:**

The species was named as Lutra perspicillata by Geoffroy 1826 and as Lutrogale perspicillata by Gray 1865. Two subspecies were reported (Pocock 1941) (1) L. p. perspicillata - in northeast and southern India, Myanmar and Sumatra; and (2) L. p. sindica - in north and northwestern India and Pakistan. Another subspecies L. p. maxwelli, whose current status is uncertain, is reported from the marshes of southern Iraq (Mason and Macdonald 1986).

- **Assessment Information**
- **Red List Category & Criteria: Vulnerable A2cde ver 3.1**
- **Year Published: 2015**
- **Date Assessed: June 14, 2014**
- **Justification for Least Concern:**

This species is confirmed to be Vulnerable due to an inferred population decline due to habitat loss and exploitation. The Smooth-coated Otter is essentially an otter of lowlands and floodplains. Major threats to this species are loss of wetland habitats due to construction of large-scale hydroelectric projects, reclamation of wetlands for settlements and agriculture, reduction in prey biomass, poaching and contamination of waterways by pesticides. In most Asian countries where there has been increased human population during the last century, inadequate and ineffective rural development programmes have not been able to address the problems of poverty, forcing people to be more and more dependent on natural resources. Consequently, most of the wetlands and waterways do not have an adequate prey base for sustaining otter populations. Wetlands and waterways are polluted by eutrophication and accumulation of persistent pesticides. Increased pesticide use is not only regarded as a major obstacle to the development of rice-fish culture, but also poses a danger to all predators feeding on aquatic prey in the area. In the entire south and southeast Asia there is severe conflict between otters and humans, because of poverty and recent increases in aquaculture activities leading to indiscriminate killing of otters. In south and southeast Asian countries, prevalent poaching pressure is affecting its survival. Given the extent of loss of habitat that is occurring in south and southeast Asia and the intensity of poaching a reduction in otter population size has been observed in many parts of its range (Hussain 1993, Melisch et al. 1996, Hussain 2002, Nawab and Hussain 2012). It is believed that the population has been wiped out from most parts of its range in Iraq due to intensive poaching pressure (Al-Sheikhly 2012). During 1991 -2003 wide areas of reed beds and lakes of southern Iraq marshes were reclaimed affecting otter population, though recent surveys have confirmed their persistence from southern as well as northern Iraq (Al-Sheikhly and Nader 2013). In view of these, it is concluded that although the quantitative data on population sizes and trends are lacking, it is inferred that the global population of the Smooth-coated Otter has declined by more than 30% over the past 30 years (Pacifici et al. 2013).

- **Previously Published Red List Assessments**

2008 – Vulnerable (VU)

2004 – Vulnerable (VU)

2000 – Vulnerable (VU)

1996 – Vulnerable (VU)

1994 – Insufficiently Known (K)

1990 – Insufficiently Known (K)

1988 –Insufficiently Known (K)

- **Geographic Range**

Range Description: The Smooth-coated Otter is distributed throughout south Asia and southeast Asia. Its distribution is continuous from Indonesia, through southeast Asia, and westwards from southern China to India and Pakistan, with an isolated subpopulation in Iraq (Pocock 1941, Medway 1969, Hussain 1993). Though its current status in the Middle East is not known, its presence has been confirmed from Pakistan, India, Nepal, Bhutan, Bangladesh, southwest China, Myanmar, Thailand, Viet Nam, Malaysia (Penisular Malaysia, Sabah and Sarawak), and Indonesia (Kalimantan, Sumatra, Java) and Brunei (Mason and Macdonald 1986, Corbet and Hill 1992, Wozencraft 1993).

- **Country Occurrence:**

Native: Bangladesh; Bhutan; Brunei Darussalam; Cambodia; China; India; Indonesia; Iraq; Lao People's Democratic Republic; Malaysia; Myanmar; Nepal; Pakistan; Thailand; Viet Nam

- **Distribution Map**

Lutrogale perspicillata

Range

Extant (resident)

Compiled by:
IUCN (International Union for Conservation of Nature)

- **Population**

Because of the secretive and nocturnal behaviour of Smooth-coated Otter, reliable estimates of its population are not available. In southeast Asia it is found in large groups (Foster-Turly 1992, Hussain 1993, Hussain 1996) where the basic family group consists of an adult female and her offspring, the father of the offspring, and older siblings may often join the group (Lekagul and McNeely 1988, Hussain 1996). The group size varies considerably between months and seasons, the group being largest during the monsoon period (Hussain 1996). Along the Chambal River in central India the group size ranges from 1-9 individuals (mean=4.62). During a study conducted in the Corbett Tiger Reserve, in north India an estimate of 41 individuals (35 adults and 6 juveniles) with a mean of 5.1±1.55 was recorded from the 85 km of river stretch within the Reserve (Nawab and Hussain 2007).

Current Population Trend: Decreasing

- **Habitat and Ecology**

The Smooth-coated Otter is essentially a plains otter. In the Indian subcontinent they are adapted to live even in the semiarid region of northwestern India and Deccan plateau (Prater 1971). Generally, it uses large rivers and lakes, peat swamp forests, mangroves and estuaries, and it even uses the rice fields for foraging (Foster-Turly 1992). In southeast Asia rice fields appear to be one of the most suitable habitats in supporting its viable populations (Melisch et al. 1996). However, they were more abundant in the mangroves of Kuala Gula, Malaysia as compared to the rain forest rivers (Shariff 1984).

Along the large rivers in India, the Smooth-coated Otters prefer rocky stretches since these stretches provide sites for den and resting. River stretches with bank side vegetation and marshes are used in proportion to their availability especially in summer as they provide ample cover while travelling or foraging. Open clayey and sandy banks are largely avoided as they lack escape covers (Hussain 1993; Hussain and Choudhury 1995, 1997). In the Tarai areas of the upper Gangetic plains the Smooth-coated Otters use seasonally flooded swamps during monsoon (July-September) and in early winter (OctoberFebruary). Winter being the breeding season, the swamps are extensively used as natal den sites and nursery. By February-March the swamps begin to dry and the fish biomass appears to be depleted, consequently the otters move to the perennial rivers (Hussain and Choudhury 1997). In west Java, the Smooth-coated Otters prefer mangroves and tidal stretches of the rivers and rice fields. Freshwater swamps and coastal stretches lacking vegetation are avoided (Melisch et al. 1996). In rice fields and pond areas they prefer sites having moderate diversity of vegetation. Rivers with moderate to slow or stagnant water and water bodies having a width of 10-40 m are preferred. In Huai Kha Khaeng, Thailand, the Smooth-coated Otters extensively use the slowly meandering river near the dam and the dam itself (Kruuk et al. 1994).

The Smooth-coated Otter is predominantly a fish eater, but supplements its diet with shrimp/crayfish, crab and insects, and other vertebrates such as frog, mudskippers, birds and rats (Prater 1971, FosterTurly 1992, Hussain and Choudhury 1998). In general, its diet is similar to that of Eurasian Otter.

The range of fish in the diet varies from 75% to 100% (Tiler et al. 1989, Foster-Turly 1992, Hussain 1993, Melisch et al. 1996, Hussain and Choudhury 1998).

The Smooth-coated Otters exhibit the typical opportunistic feeding behaviour similar to the Eurasian Otter. Along the major rivers in India they eat more fish, often making up to 94% of the total diet(Hussain and Choudhury 1998), while along the coast in mangrove habitats and in rice fields it ranges between 75-100% (Foster-Turly 1992, Melisch et al. 1996). In west Java otters inhabiting mangrove areas eat more of crustaceans, around 22% of the scats contain remains of crab and shrimp where as in the paddy fields in Malaysia, along with fish they tend to eat more rice field rats Rattus argentiventer, represented in 23% of the spraints (Foster-Turly 1992).

Hussain (1993) identified 12 fish species from the spraint of Smooth-coated Otter from the Chambal River, of which seven species were eaten throughout the year. Rhinomugil corsula (Mugilidae) and Rita rita (Bagaridae) were the preferred species. At least eight species of fish were identified from the spraints from Malaysia (Foster-Turly 1992). Some of these include Gourami (Trichogater spp.), Climbing Perch (Anabis testudineus), catfish (Clarius spp.), snakehead (Channa spp.) and mudskipper (Gobioidei). In the rice fields they ate large amount of most common fish (Trichogater and Anabis spp.). The size of the fish consumed varied from 5-46 cm, often ranging between 15-30 cm (Wayre 1978). No significant relationship was found between the calorific values of the fish and the quantities consumed. Thus, the prey selection by Smooth-coated Otter is mainly influenced by its availability (Hussain 1993).

The Smooth-coated Otter attains sexual maturity at twenty-two months in captivity (Desai 1974). Yadav (1967) observed first litter at four years of age. In captivity they mate during August to October in water followed by prolonged playful bouts between partners (Desai, 1974, Naidu and Malhotra 1989). Copulation takes place several times daily. Males are polygamous mating with up to four females (Desai 1974). In the wild in northern India mating occurs in August-September and littering in NovemberDecember (Hussain 1993). Desai (1974) observed litter size of 2-5 (mean = 3.25). Similarly, Naidu and Malhotra (1989) observed litter size 1-5. The breeding schedule of Smooth-coated Otters in the wild in India corresponds with the captive records (Hussain 1993, 1996). Evidences of littering have been recorded in October and the cubs were seen out of the den in February. The mean litter size along the Chambal River was three (Hussain 1996).

Based on the percentage of active telemetry recordings, Hussain (1993) observed that the overall activity pattern of Smooth-coated Otters along the Chambal River in India was in the form of a bimodal curve in which two period of high activity were separated by a period of relative inactivity. This pattern of activity varied considerably among seasons. In summer, the relative period of inactivity was greater than in winter or monsoons. A significant difference was also found between day and night time activities in different seasons. Otters were more diurnal during winter than in summer or monsoon.

Hussain (1993) observed daily movements of four radio-implanted Smooth-coated Otters of different age and sex within their home range. Two types of movements were identified; small-scale movements associated with foraging in a restricted area close to dens, and more extensive travels between dens and foraging sites. Most of the movement was restricted between 250 to 1,500 m. A typical group of Smooth-coated Otter consisting of male, female, and up to four young ones require 7

to 12 km of river for their territory and an even longer stretch of shoreline if living along the coast (Wayre 1974). During a radio-tracking study along the Chambal River, India, the home range of all the otters tracked overlapped intensively. Among the radio-implanted otters, the maximum home range was observed in sub-adult male and the minimum in juvenile female and male. Among the non-tagged otters, the home range of female with cubs was estimated as 5.5 km. In case of the adult male it was estimated to be approximately 17 km (Hussain 1993). Along the Chambal River, the home range length and area of smooth-coated otter was less than that of Eurasian Otter, in Perthshire, Scotland and North American River Otter Lontra canadensis in Idaho (Melquist and Hornocker 1983), but larger than that of Eurasian Otter (Erlinge 1967) in Sweden.

Systems: Terrestrial, Freshwater, Marine

- **Use and Trade**

Species is illegally utilized in wildlife trade.

- **Threats**

Major threats to Asian otter populations are loss of wetland habitats due to construction of large-scale hydroelectric projects, reclamation of wetlands for settlements and agriculture, reduction in prey biomass, poaching and contamination of waterways by pesticides. In most Asian countries although there has been increased human population during the last century, inadequate and ineffective rural development programmes have not been able to address the problems of poverty, forcing people to be more and more dependent on natural resources (Badola 1997). Consequently, most of the wetlands and waterways do not have adequate prey base for sustaining otter populations. Wetlands and waterways are polluted by eutrophication and accumulation of persistent pesticides such as chlorinated hydrocarbons and organophosphates through agricultural runoffs. Increased pesticide use is not only regarded as a major obstacle to the development of rice-fish culture, but also poses a danger to all predators feeding on aquatic prey in the area (Melisch et al. 1996). In the entire south and southeast Asia there is severe conflict between otters and humans, because of poverty and recent increase in aquaculture activities leading to indiscriminate killing of otters. Many important habitats of smooth otter have been lost to development activities. In southeast Asian countries, there does not seem to be any intentional otter trapping (Melisch et al. 1996) though it is prevalent in India, Nepal and Bangladesh.

- **Conservation Actions**

Since 1977, the Smooth-coated Otter has been listed on Appendix II of CITES. However, most range countries are not able to control the clandestine trade leading to extensive poaching. Nevertheless, it is a protected species in almost all the range countries which prohibits its killing.

The Smooth-coated Otter, once common in the wetlands and low lying areas of south Asia, is now restricted to a few protected areas. Creation of networks of Protected Areas, identification of sites as wetland of national and International importance under Ramsar Convention has to some extent halted the degradation of its habitat.

Over the years the IUCN SSC Otter Specialist Group has developed a cadre of biologist across Asia to conduct field surveys and has popularize otter conservation by promoting otters as ambassadors of the wetlands. However, concerted efforts to conserve this species are needed. For the long term survival of the species, policy based action, research on factors affecting its survival, habitat based action on creation and where required expansion of protected areas and communication and awareness building actions are needed.

4.6 CONSERVATION STATUS OF REPTILES

- **Mugger Crocodile (Crocodylus palustris)**

- **Taxonomy**

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Reptilia	Crocodylia	Crocodyliae

- **Taxon Name** Crocodylus palustris Lesson, 1831
- **Common Name(s)**

English: Mugger, Broad-snouted Crocodile, Marsh Crocodile, Muggar

French: Crocodile des Marais, Crocodile paludéen, Crocodile palustre

Spanish: Cocodrilo del Marjal, Cocodrilo Marismeño

- **Assessment Information**
- **Red List Category & Criteria: Vulnerable A2cd ver 3.1**
- **Year Published: 2013**
- **Date Assessed: June 30, 2009**
- **Justification for Least Concern:**

A past population decline of 30% over three generations (75 years) has been inferred due to direct observations of declines in abundance, reductions in range and habitat quality and extirpation from part of the range. These declines, due to threats such as habitat destruction and illegal poaching, are now thought to have stopped with populations generally stable or recovering. Total global population

estimated at less than 8,700 non-hatchlings and overall stable and increasing although continuing decline is reported in some areas, populations are restricted between drainages, regions and countries and not in contact- therefore fragmented and no single population estimated to be more than 1,000 mature individuals. An assessment of Vulnerable under criterion A2cd has therefore been made for Crocodylus palustris.

- **Previously Published Red List Assessments**

1996 – Vulnerable (VU)

1994 – Vulnerable (V)

1990 – Vulnerable (V)

1988 – Vulnerable (V)

1986 – Vulnerable (V)

1982 – Vulnerable (V)

- **Geographic Range**

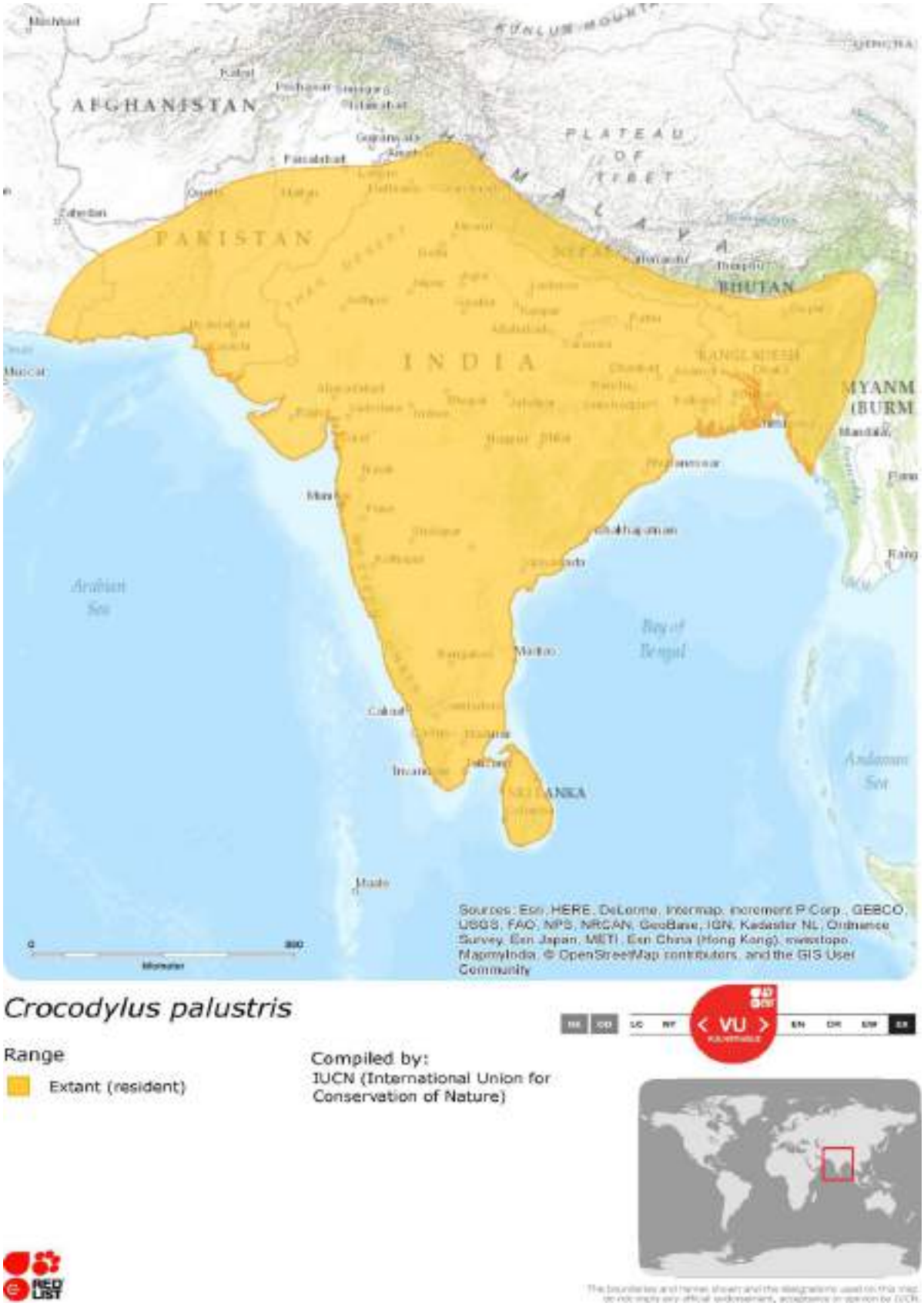
Range Description:

This species is found in India, Sri Lanka, Pakistan, Nepal and possibly from Bangladesh, its range extends westwards into eastern Iran. The species has become locally extinct over large parts of its

range, and viable populations only occur in protected areas (Santiapillai and Silva 2001). This has led to severe fragmentation of the population across its range. India and Sri Lanka retain the major populations. In India it is reported present in 15 of India's 28 states from Kerala and Tamil Nadu in the south, in the lowlands of east and west sides of the peninsula in Karnataka, Goa, and Orissa and through much of the Ganges drainage. Significant populations occur in the middle Ganges (Bihar and Jharkand), Chambal river (Rajastan and Madhya Pradesh) and in Gudgerat. In Sri Lanka approximately half the known population occurs within protected areas including Wilpatu and Yala National parks and the Jaffna peninsula.

The last recorded sighting of this species is Myanmar occurred in 1867-68 suggesting that this species is probably extinct there (Van Dink 1993 in Ross 1998). The species is extinct in the wild in Bangladesh (Cox and Rahman 1994) and represented only in very small captive populations. The species was last seen in Bhutan in the 1960s (Whitaker and Andrews 2003). This species is known to occur up to 420 m above sea level.

- **Distribution Map**



- **Population**

India: Muggers are reported from 15 States and the wild population is tentatively estimated as 3,021 to 4,287 non-hatchlings (Whitaker and Andrews 2003; R. Whitaker pers.comm. Colombo workshop 2013;). Numbers of non-hatchling Mugger in National Chambal Sanctuary (India) have apparently increased from 105 to 226 in 16 years (R.K. Sharma, data collected for the Madhya Pradesh Forest Department; Sharma et al. 1995). Human-Mugger conflict has been reported from different parts of the country (Whitaker 2007, 2008), indicating possible increases in population and/or Mugger reaching larger sizes.

- **Habitat and Ecology**

This species is found in freshwater habitats including, rivers, lakes, reservoirs, hill streams, village ponds and man made tanks. It may also be found in coastal saltwater lagoons. This species is a hole-nesting species

The Mugger is a hole-nesting species, with egg-laying taking place during the annual dry season. Females become sexually mature at approximately 1.8-2 m, and lay 25-30 eggs (Whitaker and Whitaker 1989). Nests are located in a wide variety of habitats, and females have even been known to nest at the opening of, or inside, their burrow (B.C. Choudhury pers. comm.). In captivity, some Muggers are known to lay two clutches in a single year (Whitaker and Whitaker 1984), but this has not been observed in the wild. Incubation is relatively short, typically lasting 55-75 days (Whitaker 1987). Whitaker and Whitaker (1989) provide a good review of the behaviour and ecology of this species.

Like a number of other crocodilians, C. palustris is known to dig burrows. Whitaker and Whitaker (1984) referred to Mugger burrows in Sri Lanka and India (Gujarat and South India) and noted that yearling, sub-adult and adult Mugger all dig burrows. In Iran they are sometimes known to dig two burrows close to each other, which may be used by one or more crocodiles (Mobaraki 2002). These burrows are presumably utilized as an effective refuge from hot daytime ambient temperatures. These burrows play a critical role in the survival of crocodiles living in harsh environments (Whitaker et al. 2007), allowing them to avoid exposure to excessively low and high temperatures (<5ºC and >38ºC respectively) for long periods of time, which may be lethal (Lang 1987). Mugger are known to undertake long-distance overland treks in Gir (India) (Whitaker 1977), Sri Lanka (Whitaker and Whitaker 1979) and Iran (Mobaraki and Abtin 2007). Some Muggers are killed while crossing roads in Iran (Mobaraki and Abtin 2007).

- **Use and Trade**

Eggs are taken by humans and the species is also poached in small numbers for its skin and meat as well as its use in medicine.

- **Threats**

This species was threatened by habitat destruction due to agricultural and industrial expansion, entanglement and drowning in fishing equipment, egg predation by humans, illegal poaching for skin and meat and the use of body parts in medicine. Crocodiles were often treated as pests to inland fisheries and killed whenever possible (Santiapillai and Silva 2001). There are increasing incidents of human conflict with this species and this is due to encroachment by humans into the species' natural habitats (B.C. Choudhury pers. comm.).

- **Conservation Actions**

This species is listed under CITES Appendix I. Management of the species is largely based on the legal protection of wild populations and captive breeding for restocking natural populations. Between 1978- 1992 in India, a total of 1,193 captive bred individuals have been used to restock populations in 28 protected areas (Ross 1998). However, in 1994 due to overcrowding in captive centres, the production of new offspring was ceased by the Indian Government. Protection is moderately effective in protected areas in India, Sri Lanka, and Iran.

4.7 CONSERVATION STATUS OFAVIFAUNA

- **Indian Peafowl (*Pavo cristatus*)**

- **Taxonomy**

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Aves	Galliformes	Phasianidae

- **Taxon Name *Pavo cristatus Linnaeus*, 1758**
- **Common Name(s)**

• English: Indian Peafowl, Common Peafowl, Peafowl

- **Assessment Information**
- **Red List Category & Criteria: Least Concern ver 3.1**
- **Year Published: 2016**

- **Date Assessed: October 1, 2016**
- **Justification for Least Concern:**

This species has an extremely large range, and hence does not appr oach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence <20,000 km2 combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation). The population trend appears to be stable, and h ence the species does not approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations). The population size has not been quantified, but it is not believed to approach the thresholds for Vulnerable under the population size criterion (<10,000 mature individuals with a continuing decline estimated to be >10% in ten years or three generations, or with a specified population structure). For these reasons the species is evaluated as Least Concern.

- **Previously Published Red List Assessments**

2012 – Least Concern (LC)
2009 – Least Concern (LC)
2008 – Least Concern (LC)
2004 – Least Concern (LC)
2000 – Lower Risk/least concern (LR/lc)
1994 – Lower Risk/least concern (LR/lc)
1988 – Lower Risk/least concern (LR/lc)
(*Source: http://dx.doi.org/10.2305/IUCN.UK.2012-1.RLTS.T22679435A40098247.en)

- **Geographic Range**

The Indian sub-continent is the natural habitat of the Indian Peafowl. It is found in good numbers in Indian Territory ranging from Outer Himalayas through vast stretch of the country including the Peninsula. It is also found in Pakistan, Nepal and Sri Lanka. The arid deserts of Rajasthan, the riverbanks of Gujarat and Madhya Pradesh, the foothills of the Himalayas in Uttar Pradesh and the forests of Haryana – these are considered to be the major and commonly-known habitats of peacocks in India.

- **Distribution Map**

- **Appearance**

The Indian peacock has iridescent blue and green plumage. The peacock "tail", known as a "train", consists not of tail quill feathers, but highly elongated upper tail coverts. These feathers are marked with eyespots, best seen when a peacock fans his tail. Both sexes of all species have a crest atop the head. The Indian peahen has a mixture of dull grey, brown, and green in her plumage. The female also displays her plumage to ward off female competition or signal danger to her young. Male peacock has a spectacular glossy green long tail feathers that may be more than 60 percent of the bird's total body length. These feathers have blue, golden green and copper colored ocelli (eyes). The long tail feathers are used for making rituals like court ship displays. The feathers are arched in to a magnificent fan shaped for macros the back of the bird and almost touching the found on both sides. Females do not have these graceful tail feathers. They have the fan like crest with whitish face and throat, chest nut brown crown and hind neck, metallic green upper breast and mantle, white belly and brown back rump and tail. Their primaries are dark brown.

- **Habitat and Behaviour**

The scrub jungles and forest edges are the natural habitat of this bird; has affinity towards moist & dry deciduous and semiarid biomes. It is also found along streams with good vegetation and in agricultural fields and in close proximity with the human settlements. Habitat mosaic of scrub and open areas with ample sites for "dust bathing" and "lekking". Dust bathing is critical as this bird has to condition its feathers and remove feather-degrading bacteria and other external parasites. The peafowl are forest birds that nest on the ground. The peafowl are terrestrial feeders but roost in trees. It has got a loud scream that can scary many enemies. The life expectancy is about 10-15 years.

- **Food and Feeding Habits**

Peafowls are omnivores, eating plant parts, flower petals, seed heads, insects and other arthropods, reptiles and amphibians. In the study area at some places, dense tree canopy cover supports good insect diversity which is very common food for peafowls.

- **Threats in the Study Area**

No perceptible threats were identified in the villages surveyed. Village residents are against hunting or poaching of the peafowl, due to culture and mythology reasons. Adult peafowl can usually escape ground predators by flying into trees.

a) For aging in groups provides some safety as there are more eyes to look out for predators.

b) Habitat loss, specially the shortage of tall trees in and around the villages for roosting and for providing shade during hot summer months.

c) Shortage of drinking water for the birds during the hot summer days.

d) Casualties caused by eating chemically treated agricultural crop seeds.

e) Illegal hunting by some communities.

- **Long Billed Vulture (Gyps indicus)**

- **Taxonomy**

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Aves	Accipitriformes	Accipitridae

- **Taxon Name** Gyps indicus (Scopoli, 1786)
- **Common Name(s)**

• English: Indian Vulture, Indian Griffon, Long-billed Griffon, Long-billed Vulture, Painted Vulture

- **Taxonomic Source(s):**

Rasmussen, P. C.; Parry, S. J. 2001. The taxonomic status of the "Long-billed" Vulture Gyps indicus. Vulture News 44: 18-21.

- **Identification Informations:**

92 cm. Typical Gyps vulture. Robust, strong features giving eagle-like bearing. Perched adults have pale- yellowish bill and cere; pale eyerings; large white neck-ruff; and buff back and upperwing coverts. The stout blackish neck has pale down. Juveniles have dark bill with pale culmen; pinkish head and neck covered in pale down and dingy heavily streaked underparts. In flight thighs are heavily feathered and concolourous with the rest of the underparts. Similar spp. Told from the allopatric and distinctive Slender-billed Vulture G. tenuirostris by robust build, clean plumage, pale bill (in adults) and downy head and neck (juveniles).

- **Assessment Information**
- **Red List Category & Criteria: Critically Endangered A2bce+4bce ver 3.1**
- **Year Published: 2017**

- **Date Assessed: October 1, 2017**
- **Justification for Least Concern:**

This species is classified as Critically Endangered because it has suffered an extremely rapid population decline as a result of mortality from feeding on carcasses of animals treated with the veterinary drug diclofenac.

- **Previously Published Red List Assessments**

2016 – Critically Endangered (CR)

http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T22729731A95021258.en

2015 – Critically Endangered (CR)

http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T22729731A79451078.en

2013 – Critically Endangered (CR)

http://dx.doi.org/10.2305/IUCN.UK.2013-2.RLTS.T22729731A48007205.en

2012 – Critically Endangered (CR)

2010 – Critically Endangered (CR)

2009 – Critically Endangered (CR)

2008 – Critically Endangered (CR)

2004 – Critically Endangered (CR)

2002 – Critically Endangered (CR)

2000 – Not Recognized (NR)

1994 – Not Recognized (NR)

1988 – Not Recognized (NR)

- **Geographic Range**

Range Description:

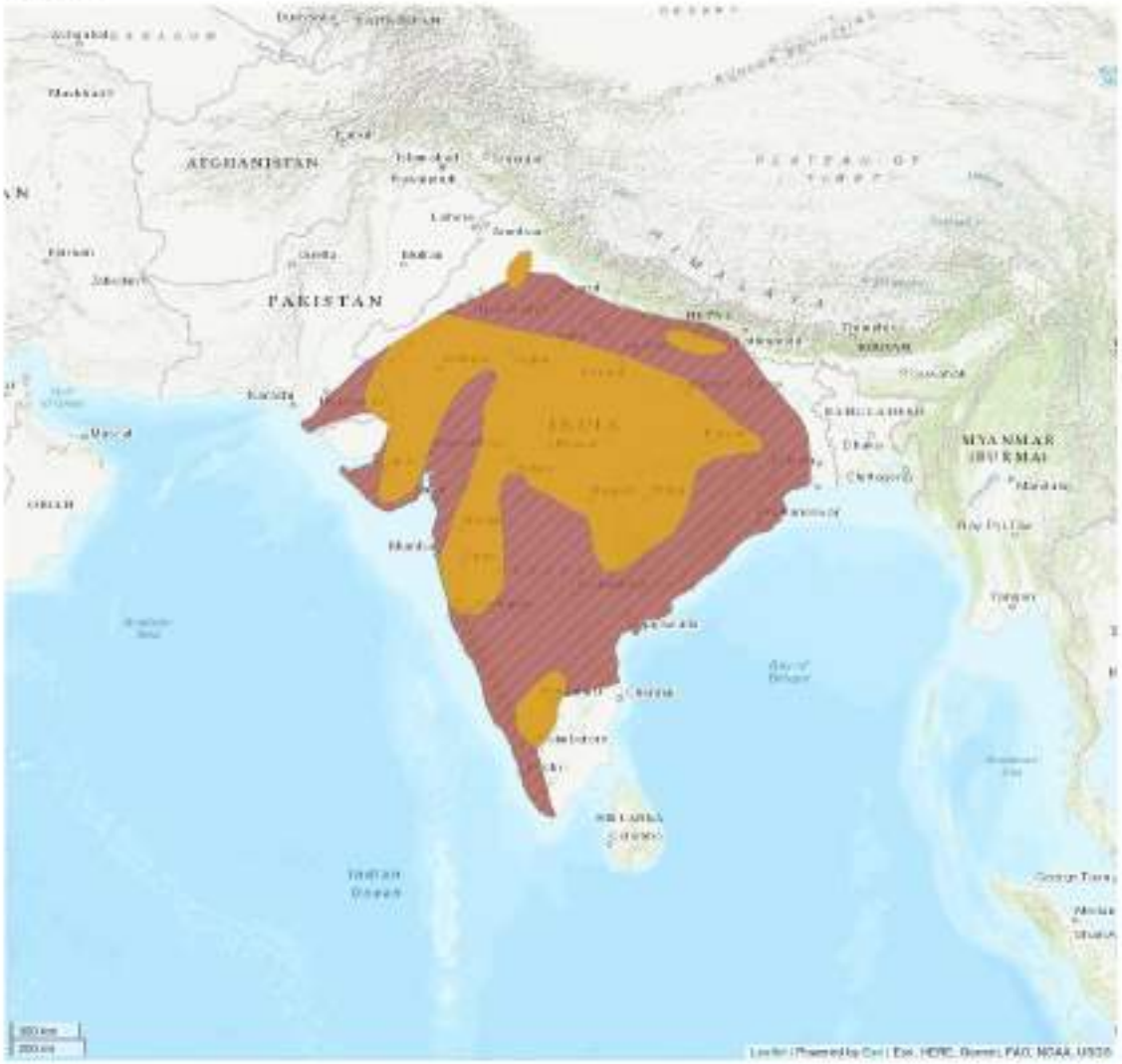
Gyps indicus breeds in south-east Pakistan and peninsular India south of the Gangetic plain, north to Delhi, east through Madhya Pradesh, south to the Nilgiris, and occasionally further south (Collar et al. 2001). The species was first recorded in Nepal in 2011 (Subedi and DeCandido 2013). It was common until very recently, but since the mid-1990s has suffered a catastrophic decline (over 97%) throughout its range. This was first noticed in Keoladeo National Park, India (Prakash et al. 2003), where counts of feeding birds fell from 816 birds in 1985-1986 to just 25 in 1998-1999. Only tiny populations in the Ramanagaram Hills of Karnataka and Nilgiri Forest Division in Tamil Nadu are known to remain in inland southern India, and it is rare elsewhere within its former range (Prakash et al. 2007, Venkitachalam and Senthilnathan 2015, 2016). Extensive research has identified the non-steroidal anti-inflammatory drug (NSAID) diclofenac to be the cause behind this rapid population collapse (Green et al. 2004, Oaks et al. 2004a, Shultz et al. 2004, Swan et al. 2006b), and other drugs have subsequently been identified to have similar effects on Gyps vultures (Naidoo et al. 2010, Zorrilla et al. 2015, Cuthbert et al. 2015). Diclofenac, used to treat domestic livestock, is ingested by vultures feeding on their carcasses leading to renal failure causing visceral gout (Oaks et al. 2004 a,b; Swan et al. 2006b, Gilbert et al. 2006). It is now rare in Pakistan, although a colony of 200-250 pairs was discovered in 2003 in Sindh Province (A. A. Khan in litt. 2003). In 2007, the total Indian population, based on extrapolations from road transects, was estimated at 45,000 individuals, with a combined average annual decline for this species and G. tenuirostris of over 16% during 2000-2007 (Prakash et al. 2007), though data indicate that the rate of population decline of G. tenuirostris and G. indicus combined has now slowed in India (Prakash et al. 2012). It is estimated that its relative abundance in Pakistan declined by 61% between 2003-2004 and 2006-2007, this was followed by a 55% increase by 2007-2008 (Chaudhry et al. 2012), and a new breeding colony appears to have developed near the India-Pakistan border in the Bikaner District, India.

- **Country Occurrence:** Native: India; Pakistan
- **Vagrant:** Nepal
- **Present -** origin uncertain: Afghanistan

- **Distribution Map**

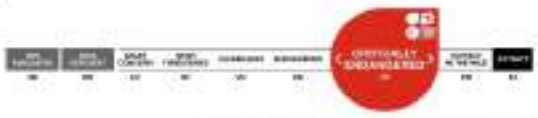
Distribution Map

Gyps indicus



Legend
EXTANT (RESIDENT)
POSSIBLY EXTINCT

Compiled by:
BirdLife International and Handbook of the Birds of the World (2017)
2017



- **Population**

A population estimate of c.45,000 individuals has been extrapolated from 2007 survey results published by Prakash et al. (2007), who recorded 337 individuals along 18,000 km of road transects. This very roughly equates to 30,000 mature individuals.

- **Trend Justification**

Survey results indicate that declines throughout the Indian Subcontinent probably began in the 1990s and were extremely rapid, resulting in an overall population decline of greater than 97% over a 10-15-year period.

Current Population Trend: Decreasing

- **Habitat and Ecology**

It is found in cities, towns and villages near cultivated areas, and in open and wooded areas. This species feeds almost entirely on carrion, and often associates with White-rumped Vulture G. bengalensis when scavenging at carcass dumps and slaughterhouses. It nests almost exclusively in colonies on cliffs and ruins, although in one area, where cliffs are absent, it has been reported nesting in trees. Vultures also play a key role in the wider landscape as providers of ecosystem services, and were previously heavily relied upon to help dispose of animal and human remains in India; which in turn reduces the amount of food available for potentially problematic species, such as feral dogs (Prakash et al. 2012b).

Systems: Terrestrial

- **Threats**

By mid-2000, Gyps vultures were being found dead and dying in Pakistan and throughout India, and major declines and local extirpations were being reported. The anti-inflammatory drug diclofenac, used to treat domestic livestock, has been identified as the cause of mortality, with renal failure resulting in visceral gout in the vast majority of examined vultures (Oaks et al. 2004a, Shultz et al. 2004, Swan et al. 2006b, Gilbert et al. 2006). Vultures are exposed to diclofenac and other NSAIDs through scavenging on the carcasses of largely cattle and buffalo that have been treated with the drugs prior to death and left for scavengers to consume (as is tradition in Hindu cultures). Vultures are unable to process diclofenac and other vulture-toxic NSAIDs that then cause renal failure and death. Modelling has shown that to cause the observed rate of decline in the species just one in 760 livestock carcasses need contain diclofenac residues (Green et al. 2004), and sampling livestock carcasses in India between 2004 and 2005 showed that 10% were contaminated with diclofenac (Taggart et al. 2009). Despite awareness programmes to educate locals about the association between diclofenac and vulture mortality, a survey in Nepal indicated that the vast majority of people still do not link diclofenac use to a decline in vulture populations (Paudel 2008), potentially leading to a slower uptake of meloxicam (a safe alternative). Recent bans of diclofenac in the region still have not eradicated its use in veterinary treatments, as it is still found in the carcasses of livestock and vultures (Cuthbert et al. 2014, 2015). This may be because the drug continues to be produced for human consumption,

which is then sold on for veterinary purposes (Cuthbert et al. 2011, T. Galligan in litt. 2016); though this is not somuch of a problem in Nepal and Pakistan (SAVE 2015). A second veterinary drug in use in India and particularly Bangladesh, ketoprofen, has also been identified to be lethal to the species, and measurements of residue levels in ungulate carcasses in India indicates that concentrations are sufficient to cause vulture mortalities (Naidoo et al. 2010). The availability of other NSAIDs, such as ketoprofen, is increasing (Cuthbert et al. 2011; Khan 2013) and concern has been raised about the toxicity of nimesulide and flunixin (Zorrilla et al. 2015, Cuthbert et al. 2015) as well as aceclofenac which is metabolised into diclofencac, and so is in effect as toxic to vultures as diclofenac (Galligan et al. 2016). Other likely contributory factors are changes in human consumption and processing of dead livestock (which have occurred in response to the collapse in vulture numbers), and poison and pesticide use, but these are probably of minor significance.

- **Conservation Actions**

Conservation Actions Underway

CITES Appendix II. It has been reported from many protected areas across its range. The Indian government has now passed a bill banning the manufacture of the veterinary drug diclofenac that has caused the rapid population decline across the Indian subcontinent; their aim was to phase out its use by late 2005 (Gilbert et al. 2006, Swan et al. 2006a), although its sale has not been banned and it is likely to remain in widespread use for several years. Similar laws banning import and manufacture of diclofenac are now in place in Nepal and Pakistan. A letter from the Drug Controller General of India in 2008 warned more than 70 drugs firms not to sell the veterinary form of diclofenac, and to mark human diclofenac containers 'not for veterinary use' (BirdLife International 2008). In October 2010, the government of Bangladesh banned the production of diclofenac for use in cattle, and the distribution and sale of the drug were due to be outlawed there during the first half of 2011 (M. M. H. Khan in litt. 2010). However, human diclofenac continues to be sold for veterinary use (Cuthbert et al. 2011), and as such the Government of India banned the manufacture of all diclofenac products in vial sizes larger than 3 ml (the single dose for humans) in 2015, which is predicted to make the drug too expensive and too complicated to use on large-bodied animals and thereby stop its misuse in livestock (T. Galligan in litt. 2016). Efforts to replace diclofenac with a suitable alternative are ongoing; drug companies have now developed meloxicam, an alternative to diclofenac, which has been tested on Gyps vultures with no illeffects (Swan et al. 2006a). Outreach activities have promoted this as the only vulture-safe alternative to diclofenac (T. Galligan in litt. 2016).

The Report of the International South Asian Vulture Recovery Plan Workshop in 2004 gave a comprehensive list of recommendations including establishing a minimum of three captive breeding centres each capable of holding 25 pairs (Bombay Natural History Society 2004) - ultimately at least 150 pairs of the three species should be held in captivity to ensure sufficient birds are available to reestablish wild colonies in the future (Lindsay 2008). Captive breeding efforts are ongoing and during 2008-2009 there were 71 individuals in captivity at two captive breeding centres in India (Pain et al. 2008, Bowden 2009). In 2009, captive birds laid eggs, raising hopes that they will successfully breed in captivity in the near future (Bowden 2009). By November 2011 there were 83 individuals in captivity at two centres, 11 of these were juveniles that had successfully fledged (Bowden et al. 2012); and by

2015 the Indian breeding centres were fledgy 60 juveniles per year of all three resident Gyps vultures combined (V. Prakash pers. comm. per C. Bowden in litt. 2016). SAVE (Saving Asia's Vultures from Extinction) has developed the concept of Vulture Safe Zones; areas (with a minimum of 100 km radius, equating to 30,000 km^2) around important vulture breeding colonies, where education and advocacy efforts are focused on eliminating the use of diclofenac and other vulture-toxic drugs (Galligan 2013, Mukherjee et al. 2014). Conservation activities include: meeting key groups (e.g. pharmacists, veterinarians and livestock owners); engaging government officials (e.g. drug control, livestock services and forest departments) at tehsil, district and state levels; engaging with the public (e.g. festival programmes, media coverage and signage); diclofenac-free district declaration; community-run formal or informal Vulture Safe Feeding Sites (i.e., vulture [Jatayu] restaurants); vulture-related income generation for villages at nesting or feeding sites; diclofenac-meloxicam exchanges; husbandry and veterinary training camps; and national and international ecotourism to feeding sites and conservation breeding sites (T. Galligan in litt. 2016). There are currently 12 provisional Vulture Safe Zones being established in India, Nepal, Pakistan and Bangladesh (Mukherjee et al. 2014). These areas will provide a safe environment into which birds bred in captivity can be released (Bowden et al. 2012). Diversionary feeding has been shown to reduce (but not eliminate) vulture mortality from diclofenac poisoning, and uncertainty over the movements of Asian Gyps vultures makes the effectiveness of measures such as these uncertain (Pain et al. 2008). Satellite tagging has been employed on Asian Gyps vultures to improve understanding of their movements and range use so as to aid the development of conservation strategies for the genus (Ellis 2004).

An action plan for vulture conservation in India was written in 2006 (Ministry of Environment & Forests 2006), but has not been updated. In 2012 the governments of India, Pakistan, Nepal and Bangladesh adopted a number of priority actions for the conservation of vultures, proposed by SAVE. These include banning large multi-dose vials of human diclofenac, testing other NSAIDs for toxicity to vultures and expanding the Vulture Safe Zones initiative (Galligan 2013). A multi-species action plan for AfricanEurasian Vultures is under development and is due to be considered by CMS at COP12 in October 2017.

Conservation Actions Proposed

Identify the location and number of remaining individuals. Measure the frequency of diclofenac treated carcasses available to vultures. Support the ban on the veterinary use of diclofenac, and attempt to implement a ban on other vulture-toxic NSAIDs. Support species management or restoration, as needed. Monitor remaining populations. Support captive breeding efforts at a number of separate centres. Manage genetic stock in the captive-bred population (Bowden et al. 2012). Promote the immediate adoption of meloxicam as an alternative to diclofenac. Test other non-steroidal antiinflammatory drugs (NSAIDs) to identify additional safe alternative drugs to diclofenac and also other toxic ones. Three drugs, aceclofenac, ketoprofen and nimesulide, are thought to be toxic to vultures (Cuthbert et al. 2015), and approximately another 10 drugs need to be tested (Galligan 2013). Fully implement restrictions in the size of diclofenac vials sold for human use to make them less practical to use for veterinary purposes and take action against companies that fail to comply with the diclofenac ban (Cuthbert et al. 2011). Attempt to estimate the potential value, in terms of ecosystem services, provided by wild vultures. Protect nesting areas. These and multiple

other Conservation Actions were proposed as part of SAVE (2014) and SAVE (2015) for all Asian vultures. Maintain and promote Vulture Safe Zones, including trans-boundary efforts. Within VSZs, promote livestock management training and provide free veterinary camps.

- **Blackbuck (Antilope cervicapra)**

- **Taxonomy**

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Cetartiodactyla	Bovidae

- **Taxon Name** Antilope cervicapra (Linnaeus, 1758)
- **Common Name(s)**

English: Blackbuck

French: Antilope Cervicapre

Spanish: Cervicapra

- **Assessment Information**
- **Red List Category & Criteria: Least Concern ver 3.1**
- **Year Published: 2017**
- **Date Assessed: June 21, 2016**
- **Justification for Least Concern:**

Although range and numbers have declined during the last 100 years, Blackbuck remain widespread and common in some areas, are increasing in many protected areas, and becoming a crop pest in other places. Habitat loss has reduced the overall range but is balanced, at least to some extent, by conversion of dense scrub and woodland to agriculture, creating more suitable, open habitats. Despite their adaptability, Blackbuck are subject to increasing pressure from human population growth, increasing numbers of domestic livestock, and economic development. There are no quantified data on population trend, but even if the species is declining overall, there is no evidence to indicate a

decline over 19 years (three generations) that is close to approaching the threshold for Vulnerable under criterion A.

- **Previously Published Red List Assessments:**

2008 – Near Threatened (NT)
http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T1681A6448761.en
2003 – Near Threatened (NT)
1996 – Vulnerable (VU)
1994 – Vulnerable (V)

- **Geographic Range**

Range Description:

The Blackbuck formerly occurred across almost the whole of the Indian subcontinent south of the Himalaya. Their range decreased during the 20th century and they are now extinct in Bangladesh and Pakistan. Blackbuck are still present in the terai zone of Nepal (Bashistha et al. 2012). The species has been introduced to the United States of America (Texas) and Argentina.

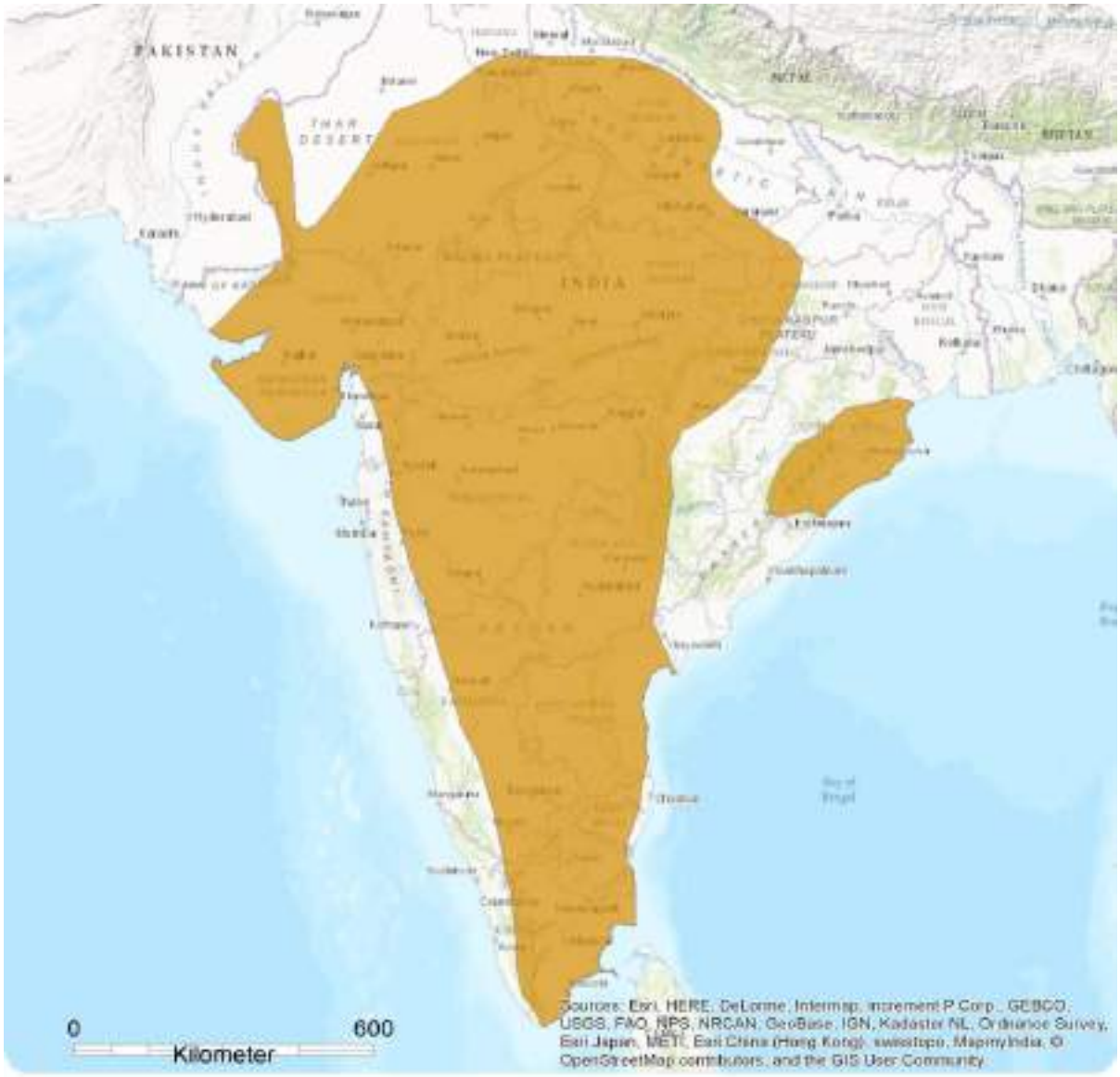
- **Country Occurrence:**

Native: India; Nepal

Regionally extinct: Bangladesh; Pakistan

Introduced: Argentina; United States

- **Distribution Map**



Range
Extant (resident)

Compiled by:
IUCN (International Union for Conservation of Nature)

- **Population**

It has been speculated that the population may have numbered 4 million a couple of centuries ago but only around 80,000 individuals were estimated in 1947. The population in India increased from an estimated 22,000-24,000 in the 1970s to an estimated 50,000 (ca 35,000 mature individuals) by 2000, with the largest numbers in the states of Rajasthan, Punjab, Madhya Pradesh, Maharashtra, and Gujarat (Rahmani 2001). Around 200 live in Nepal (Bashistha et al. 2012). Introduced populations in Argentina and the USA may number 8,600 and 35,000, respectively (Mallon and Kingswood 2001). No systematic census has been conducted and therefore no robust population estimates of current population size are available. However, it remains widespread and numerous in many places. The species has adapted to the margins of agricultural land and there is some evidence that clearance of scrub and woodland benefit it by creating suitable habitat. In some areas, the population has increased so much that the Blackbuck has become an agricultural pest, although not to the scale of Nilgai.
Current Population Trend: Unknown

- **Habitat and Ecology**

The species inhabits open grassland, dry thorn scrub, scrubland and lightly-wooded country as well as agricultural margins, where it is often seen feeding in fields. Blackbuck require water daily, which restricts distribution to areas where surface water is available for the greater part of the year. Blackbuck are primarily grazers, but browse when lack of grasses forces a greater dependency on leaf litter, flowers and fruits. They are mainly sedentary, but in summer may move longer distances in search of water and forage (Rahmani 2001).

- **Use and Trade**

Blackbuck declined sharply during the 20th century due to unsustainable hunting, and although they are now protected, some Blackbuck are still shot illegally.

- **Threats**

Although Blackbuck have disappeared from many areas due to habitat destruction through conversion to agricultural use and hunting, they are increasing in many protected areas and areas dominated by Vishnoi communities in Rajasthan and Haryana (Rahmani 2001). Conversion of dense scrub and woodland to grassland and agriculture also increases the area of suitable habitat.

- **Conservation Actions**

Blackbuck is fully protected by law in India. Blackbuck occur in many protected areas, including Velavadar Blackbuck Sanctuary in Gujarat and Point Calimere Wildlife Sanctuary in the far south of India. The species is listed in CITES Appendix III (Nepal).

5 CONSERVATION ACTION PLAN

5.1 INTRODUCTION

Each organism on this earth has a unique place in food chain that helps contribute to the ecosystem in its own special way. After independence India saw exponential growth as a result more and more forest land has been destroyed for development activities. Hence natural habitats of animals and plants are being destroyed which result many of the animals and birds are getting endangered. To protect these birds and animals many initiatives like Project tiger, Project elephant, Crocodile Conservation Project etc. have been taken up. Along with these conservation projects of the wild animals, few schemes that are worked upon to protect the biodiversity and minimize the mortality of critically endangered and threatened animals has also initiated. Instead of numerous initiatives in India, the wildlife is facing many problems in terms of survival by way of habitat loss, human invasion of inviolate spaces and developmental related activities obstructing the natural corridors of migrating animals. Hence it is necessary to conserve the forest and its wildlife for maintaining ecological balance. Wildlife conservation is the attempt to protect endangered animal and plant species, along with their natural habitat. The main objective is to make sure that their habitats will be preserved so that the future generations of both wildlife and human can enjoy it. To conserve wildlife awareness must be created among the people about its importance and involvement of local people is must in the wildlife protection.

Following action plan and financial projection has been proposed for implementation of the conservation plan in the project area.

5.2 ACTION PLAN

5.2.1 Special Stafff or the Protection and Anti-poaching

Special Staffs will be deployed by the forest department for patrolling and protection of the fauna and flora under their jurisdiction because the regular staff deployed for this purpose, due to their busy schedule, is unable to perform their work properly. Each of the special staff will be equipped with dress, raincoat, gumboots, sticks and wireless set for communication. Financial burden for the same has been included in financial projecton of this report.

5.2.2 Establishment of Emergency Response Mechanism

Immediate response is crucial to manage all conflict situations. A trained Emergency Response (ER) team consisting of an officer not below the rank of Assistant Conservator of Forests, one qualified veterinarian, and a minimum of five trained support staff may be formed in the identified conflict area. The Forest Division should have a well-trained operational ER team. Each ER team should be equipped with chemical capture equipment, drugs, appropriate cages, etc. and should wear specially designed uniforms so that they are easily identifiable during the operation. They should also have specially designed baffle boards for protection. The protocol for Emergency Response should be periodically rehearsed and reviewed to incorporate corrective measures to make it more efficient.

Establishing such well-advertised ER teams that respond effectively and quickly to conflict situations will help diffuse the usual public outrage and retaliation that invariably follows such conflicts. It will also harness the goodwill of local communities. In the long term, the efficient working of the ER teams will prevent escalation and spread of conflict. It will also prevent the situation from going out of control with people taking the law in their own hands.

5.2.3 Reducing man wildlife conflicts

Unauthorized entry into forest for illegal grazing, cutting or poaching are the major causes for Man-Wildlife conflicts. These practices will be reduced as much as possible.

5.2.4 Protection and development of habitat

Activities which may damage the habitat will be kept on watch.

5.2.5 Creating Small Water Hole/Khelis

Water holes will be constructed at the area where “Peacocks” generally (nearby habitat) found. Location of water holes will be suggested by the local forest department in consultation with the Gram Panchayat (Sarpanch).

5.2.6 Creation of drinking water facility

Water is the most important factors to all birds and animals. During drier season water availability in forest is limited, hence to provide water safely places suitable for mini watersheds will be identified in the core as well as in the buffer zone to store rainwater, so that water available throughout the year.

5.2.7 Conserving and restoring of forest area water bodies

Promote traditional techniques and practices for conserving ponds and other sources of water in the forest area.

5.2.8 Provision for environmental restoration

Ensure provision for environmental restoration during commissioning and after decommissioning of project.

5.2.9 Habitat Improvement Action Plan

Habitat improvement programme in the different villages will be under taken in the study area for shelter of the wild animals. This will be achieved by plantation of local varieties of the tree species near villages in study area. Plantation will also be carried in some forest patches identified by local forest department.

Habitat improvement programme will include plantation of native and fast growing plant species reported from the study are should be taken in to priority. In order to improve vegetation cover, it is

suggested to carry out extensive afforestation program different phases. These species will help to provide habitat for faunal species, and also increase the species diversity and maintain the naturalness of the surrounding area.

5.2.10 Seed/Saplings distribution among the villagers

During this habitat improvement programme the seeds and Saplings of indegenious fruit trees/plants will be distributed in the various villages of the study area. Compost packets will be also provided at the intervals of every six months by the proponent (in consultation of forest department).

5.2.11 Training and Awareness Programme

This is the most important aspect of wildlife conservation. People will be educated regarding the importance of wildlife conservation through mass publicity by installing sign boards, conducting audio visual classes and distributing literature in respective villages in the Study area. Experts in the field of wildlife conservation will also be invited to deliver talks through slides.

5.2.12 Promotoion of Renewable Energy Sources

To reduce the dependence on forests for fuelwood, promotion and distribution of renewable energy sources such as solar power cookers, biogas etc. will be promoted and distributed in the villages affected by the project activities.

5.2.13 Porcurement of Equipments

Various wildlife research and monitoring equoipments such as as Nets, tranqulizers and cage will be procured for propoer rescue and translocation of wildlife during emergency situation.

Signboards: Sign-board strobe displayed are

Wildlife has right to move through roads
Reptiles crossing; drive slowly
Plant tree saplings with your name
Fire destroys both the plants and animals
Capturing/ hunting wild animals is punishable offence
Don’t throw burning objects
Wildlife is our precious heritage
Inform forest officer if wildlife is in distress

5.3 MONITORING PLAN

Wildlife monitoring or estimation is a very important aspect for management of a Protected Area. It becomes more relevant and important, especially for a newly constituted Protected Area and the Landscape, where very less data is available on this subject. On account of above facts, a two-stage/ layer monitoring protocol is proposed for estimation of Wildlife in the Project study area which falls under Mahbubnagar, Nagarkarnool, Nalagonda, Rangareddy, Vikrabad and Narayanpet district Forest Divisions; is mentioned as below:

i. Protocol based on monitoring of Scheduled Speies under Wildlife (Protection) Act, 1972 using Daily/ Range level/ Long term Patrols.

ii. Monitoring for Vegetation & RET Species

5.3.1 Protocol based monitoring of Scheduled Speies under Wildlife (Protection) Act, 1972 using Daily/ Range level/ Long term Patrols.

Daily, range level and long range patrolling are important source for getting information of presence or absence of different wild animals in different areas of project area and other parts of forest division. Each patrolling team should use a GPS unit and a digital camera. Date, time and GPS coordinates of beginning of patrol should be recorded. Preferably the GPS unit shall be switched on throughout the patrol in a track log mode. The mode of patrol is also recorded, e.g. on foot, bicycle, motorcycle, vehicle etc. Signs and sightings of all Scheduled species while on patrol is recorded by entering the GPS coordinate, date and time of the sighting/sign as well as recording a digital picture of the same if possible.

Format for recording the Schdule Species presence

Date ---------- Time ---------- Range----------Beat ----------

GPSCoordinate:---------- Division Name----------

Put tick (√) marks in appropriate column			
S.no.			
3	Habitat Type	*note the habitat type*	
4	Male	*Tracks recorded*	*Not recorded*
5	Female	*Tracks recorded*	*Not recorded*
6	Cubs/Eggs	*Tracks recorded*	*Not recorded*
7	Other Carnivore Tracks	*Present*	*Not present*
8	Leopard	*Present*	*Not present*
9	Sloth bear	*Present*	*Not present*

5.3.2 Monitoring of Vegetation and RET Species

Line transact method shall be used monitoring of Vegetation and RET Species in the respective forest beats under the Forest Ranges and Divisions. Sampling for Vegetation and RET species and any impact due to humand distrurbance etc. will be done only once on a transect.

- Forest beat will be the sampling unit, and sampling will be done along the established line transect.
- The beginning and end point coordinates of the line transect need to be recorded using a GPS unit.

- Vegetation would need to be sampled every 400 m along the transect.

The vegetation would need to be quantified visually at the following categories for eachplot:

A. 15 m. radius circular plot:

- Within a distance of approximately 15 m of the observer the five most dominant trees (over-story, all vegetation >6 fit heights, including bamboo) need to be listed in the order of dominance (abundance)

- The observer needs to list the 5 most dominant shrub species (middle story, vegetation >40 cm and <6fit) in order of dominance (abundance) within 15m of the location. He needs to categorize shrub density (under-story vegetation) as absent, very low (25%), low (50%), medium (75%), and dense (100%). Shrubs will be assessed on five-point scale (0 to 4 i.e. absent to most abundant) for density estimation.

- If weeds are present, their abundance needs to be scored on 0 to 4 scale (0 being absent and 4 high abundance) and the three most common weeds seen in 15 m need to be listed in order of abundance.

- Within the same 15 m distance the observer needs to record number of signs of looping, wood cutting and presence/absence of human foot trail. Mention need to be made if people and or livestock are seen from the plot.

- The observer needs to visually quantify the canopy cover at the location. The observer should subjectively classify the proportion of the sky above him that is covered by canopy foliage and categorize it into <0.1,0.1 -0.2,0.2-0.4,0.4-0.6,0.6- 0.8, >0.8 canopy cover.

- A mention needs to be made in the data sheet regarding the number of permanent human settlements, human population, and livestock population present in the beat (to the best of his knowledge).

- A mention needs to be made based on the observers' knowledge if any non timber forest product is collected fromthebeat. If yes, which NTFP and to score the magnitude of collection on a 4 point scale (0- no collection 4-high rate of collection).

- If the beat was burnt (natural or management practice), the proportion burnt in the past 3 years need to be mention in the datasheet.

Data Sheet-3A VEGETATION (15m plot)

Name ofObserver:…… Date:…… Forest Circle: …… ForestDivision……

Range:…… Beat:…… ID No. of Line Transect:……

Plot No.	CanopyCover(0-1)	Tree Species (Descending Order of dominance, all veg. >6fit)					Shrub Species (Descending Order of dominance, all veg. >20cm &<6fit)					Shrub Abundance 0 to 4 0-absent to 4-very high	Weed/invasive Species (DescendingOrder-of dominance)			Broadvegetation
		1	2	3	4	5	1	2	3	4	5		1	2	3	

** Bamboo more than 2 m., should be entered in "tree" category, less than 2m in "shrub" category.*

Data Sheet-3B Human Disturbance

Name of Observer: ……Date: ……Forest Circle: ……Forest Division……

Range: …… Beat: ……ID No. of Line Transect: ……

Plot No.	Human Disturbances 0-4 Rating, 0-No, 4-Very high						
	Wood Cutting 0-4	Lopping 0-4	Grass/ Bamboo cutting 0-4	Presence of human/ livestock/ trail 0-4	Weed Abundance 0-4	People Seen Y/N	Livestock Seen Y/N

Are there any permanent human settlements in the beat? (Yes/No). If Yes, howmany?_ Approximate human population_____,approximate livestock population_____

Cattle____ Goat/Sheep_____Other Livestock

Is there NTFP collection inthebeat _____ Yes/No.? If yes, what NTFP iscollected?___

Rate NTFP collection on a scale of 0-4, 0-No to4-Veryhigh_____

The proportion of the beat that was burnt during the past yearwas_____ secondyear was____third year was_____1 m radius circularplot

B. 1 m. radius circular plot:

This plot should be laid 5m away from the centre of the 15m circular plat. The observer needs to use a 2m long stick to define an imaginary circle around him with the stick as the diameter. Within this circular plot (2m diameter) the observer needs to a) quantify the percent ground cover, i.e. the proportion of the ground covered by herbs, grasses, litter, and bare ground, b) List the 3 most dominant grass species, and herb species in order of dominance.

Recording Ground Cover in 1 m radius plot

Name of Observer: ……Date: ……Forest Circle: ……Forest Division……

Range: …… Beat: ……ID No. of Line Transect: ……

Plot No.	Dry leaf litter %	Ground Cover (The total percentage of following 5 columns should be 100%)					Grass Species (Report in descending order of numbers)			Herb Species (Report in descending order of numbers)			Remarks
		Dry Grass %	Green Grass %	Herb (Small Plants) %	Weeds %	Bare Ground %	1	2	3	1	2	3	

5.4 BUDGETARY FOR CONSERVATION PLAN

The proponent as proposed a sum of **Rs 539.00 Lakh** for the wildlife conservation plan under the following heads in consultation of local forest department. **Table 5.1 and Table 5.2** gives the details of budget.

Table 5.1: Budgetary allocation for conservation Plan

Year	Activities	Budget to be allocated (INR) in Lakhs
1st Year	Organizing Wild Life Awareness Programmes for conservation of wildlife and awareness of local people and students (Engaging one Educational Officer, One Eco-development Officer and One Biologist for organizing programs)	15.000
	Establishment of Animal Rescue Station, purchase of Rescue Van with equipment and Sqaud (Veterinary Officer & Trained teams)	25.000
	Purchase of equipment's such as Nets, tranquillizers equipment's and Cages etc. for proper rescue and translocation of wild animals	2.000
	Training the Emergency Response & Rescue Team	2.000

	Survey and identification of Habitats of above Schedule-I animals and birds like Vulture, Smooth coated otter, Crocodile, Wolf & Blackbuck.	5.000
	Survey, site identification, Construction of Khelis/ Water holes (Small water Ponds, Percolation tanks and check dam inside forests) & Rainwater harvesting pits in the study area and environs	20.000
	Identification of natural habitats (forests, weed eradication, pastures, grasslands etc.) for Conservation measures	10.000
	Promotion & Distribution of Alternative Energy Sources such as Solar Power, Biogas in the Project Affected Villages	5.000
	Installation of submersible water pumps of solar for wild animal in ATR	14.000
	Monitoring wildlife through E-eye (E-Surveillance) to prevent man-animal conflict in Amrabad Tiger Reserve	50.000
	SUBTOTAL	**148.000**
2nd Year	Organizing Wild Life Awareness Programmes for conservation of wildlife and awareness of local people and students (Engaging one Educational Officer, One Eco-development Officer and One Biologist for organizing programs)	15.000
	Maintenance and running charges of Animal Rescue Station & Emergency Response Team (Veterinary Officer & Trained teams).	5.000
	Construction of Fire watch tower cum protection sheds for wildlife	13.000
	Conservation programmes for natural habitats (forests, weed eradication, pastures/grasslands etc.) for Conservation measures	5.000
	Engaging Animal Trackers for protection and conservation of Schedule-I animals and their habitats, which were identfied during 1st year.	5.000
	Construction of water Khelis/ Water holes, artificial ponds & rainwater harvesting pits etc.	10.000
	Plantation of suitable fruit & flower bearing plant species in the Study area so that the wild herbivores animals can reside within the forest.	15.000
	Installation of solar submersible water pumps for wildlife	18.000
	Promotion & Distribution of Alternative Energy Sources such as Solar Power, Biogas in the Project Affected Villages	2.000

	Maintenance of tree groves, Dense bushy structure and roosting and nesting sites	2.000
	Monitoring wildlife through E-eye (E-Surveillance) to prevent man-animal conflict in Amrabad Tiger Reserve	50.000
	SUBTOTAL	**140.000**
3rd Year	Organizing Wild Life Awareness Programmes for conservation of wildlife and awareness of local people and students (Engaging one Educational Officer, One Eco-development Officer and One Biologist for organizing programs)	15.000
	Maintenance and running charges of Animal Rescue Station & Emergency Response Team (Veterinary Officer & Trained teams).	5.000
	Construction of water Khelis/ Water holes, artificial ponds & Rainwater Harvesting Pits etc.	20.000
	Engaging Animal Trackers for protection and conservation of Schedule-I animals and their habitats, which were identfied during 1st year.	5.000
	Construction of fire watch tower cum protectionsheds for Wildlife	10.000
	Conservation programmes for natural habitats (forests, pastures/grasslands etc.) for Conservation measures	5.000
	Maintenance & Repair of submersible solar water pumps.	10.000
	Maintenance of plantation of suitable fruit & flower bearing plant species in the Study area so that the wild herbivores animals can reside within the forest.	5.000
	Promotion & Distribution of Alternative Energy Sources such as Solar Power, Biogas in the Project Affected Villages	5.000
	Maintenance of tree grooves, Dens bushy structure and roosting and nesting sites	2.000
	Maintenance Monitoring wildlife through E-eye (E-Surveillance) to prevent man-animal conflict in Amrabad Tiger Reserve	25.000
	SUBTOTAL	**107.000**
4th Year	Organizing Wild Life Awareness Programmes for conservation of wildlife and awareness of local people and students (Engaging one Educational Officer, One Eco-development Officer and One Biologist for organizing programs)	15.000

	Maintenance and running charges of Animal Rescue Station & Emergency Response Team (Veterinary Officer & Trained teams).	5.000
	Engaging Animal Trackers for protection and conservation of Schedule-I animals and their habitats, which were identfied during 1st year.	5.000
	Conservation programmes for natural habitats (forests, pastures/grasslands etc.) for Conservation measures	5.000
	Maintenance & Repair of submersible solar water pumps.	5.000
	Maintenance of tree groves, Dens, bushy structure and roosting and nesting sites.	5.000
	Maintenance of plantation of suitable fruit & flower bearing plant species in the Study area so that the wild herbivores animals can reside within the forest.	5.000
	Construction of water Khelis/ Water holes, artificial ponds & Rainwater Harvesting Pits etc.	10.000
	Construction of fire watch tower cum protectionsheds for Wildlife	12.000
	Maintenance Monitoring wildlife through E-eye (E-Surveillance) to prevent man-animal conflict in Amrabad Tiger Reserve	10.000
	SUBTOTAL	**77.000**
5th Year	Organizing Wild Life Awareness Programmes for conservation of wildlife and awareness of local people and students (Engaging one Educational Officer, One Eco-development Officer and One Biologist for organizing programs)	15.000
	Maintenance and running charges of Animal Rescue Station & Emergency Response Team (Veterinary Officer & Trained teams).	5.000
	Engaging Animal Trackers for protection and conservation of Schedule-I animals and their habitats, which were identfied during 1st year.	5.000
	Conservation programmes for natural habitats (forests, pastures/grasslands etc.) for Conservation measures	5.000
	Maintenance of plantation of suitable fruit & flower bearing plant species in the Study area so that the wild herbivores animals can reside within the forest.	5.000
	Maintenance of tree groves, Dens, bushy structure and roosting and nesting sites.	5.000

	Construction of water Khelis/ Water holes, artificial ponds & Rainwater Harvesting Pits etc.	5.000
	Construction of fire watch tower cum protectionsheds for Wildlife	12.000
	Maintenance Monitoring wildlife through E-eye (E-Surveillance) to prevent man-animal conflict in Amrabad Tiger Reserve	10.000
	SUBTOTAL	**67.000**
	Grand Total :	**539.000**

Table 5.2: Year wise fund to be submitted by the user agency to State Forest Department, Telangana

Year	1	2	3	4	5
Provision in Lakhs	148.00	140.00	107.00	77.00	67.00
Provision in %	27.5%	25.97%	19.85%	14.28%	12.43%

6 CONCLUSION

Any developmental projects invariably involve the alteration of environmental conditions of a particular geographical area. As a result, these projects impose some pressure on the social, physical and biological components/structure of the project area that can affect the surrounding environment adversely. The area with such developmental projects in place may have an important effect on the subsequent environmental impacts. These impacts need to be assessed before the setting up of the projects. Therefore, such developmental activities should be carried out in harmony with the carrying capacity of nature and through judicious planning.

Large-scale development projects alter the natural surrounding and hence impact on ecosystem and its components i.e. flora and fauna, is obvious. Before implementing such projects, it is vital to understand the baseline status of floral and faunal diversity. The baseline data helps to design project in such a way that any harmful impacts on the vegetation and fauna can be avoided. It also provides an insight to mitigate plans to reorganize adverse impact on the natural surroundings.

The Baseline study for the existing ecological environment was carried out in a phased and constructive manner. Collection and generation of ecological data has been completed at two levels: Field Studies and Secondary data sources.

Field Survey was conducted by a team comprised of terrestrial and aquatic ecologists during Monsoon (07th-28th August, 2019), Post-Monsoon (5th-24th November 2019) and Pre-Monsoon (22nd February-12th March 2020).

The forests in the study area were classified into different forest type with the help of Forest Working Plan of Mahbubnagar, Rangareddy, Nagarkarnool, Vikrabad, Nalgonda and Narayanept Forest Divisions. Forest types of study area have been grouped into 5A/C3 Southern Dry Mix Deciduous Forest and 5A/C1b Dry Teak Forest.

During the surveys an inventory of different plant groups found in the study area was prepared. In the study area 57 species of plants were recorded. These include 32 trees, 12 shrubs, 13 species of herbs and climbers respectively.

32 tree species recorded in the study area belongs 22 families. The most dominant families representing the tree species in the study area were Fabaceae (06 species) followed by Combretaceae (04 species), Myrtaceae and Lamiaceae (with 02 species equally) respectively. The other 18 families represent only 01 tree species each.

The 12 species recorded in the study area belongs to 08 families. Apocynaceae, Rubiaceae, Malvaceae and Lamiaceae were found to be the most dominant families with 02 species in each family.

A total of 13 herbaceous species including herbs, grasses and climbers were recorded in the study area. The most dominant species were Poaceae with 03 species followed by Fabaceae with 02 species respectively.

During the present survey a total of Three (03) Schedule-I Species including two (02) Mammalian species i.e. Indian Wolf (*Canis lupus pallipes)* & Leopard (*Panthera* pardus) and one (01) avifaunal species i.e. Indian Peafawl (*Pavo cristatus)* is reported/observed in the project study area and its environs (10 km raidus).

For the conservation of wildlife in the Mahbubnagar, Nagarkarnool, Nalagonda, Rangareddy, Vikrabad and Narayanpet Forest Divisions; financial allocation of INR **539.00 Lakhs (5.39 crores)** have been made to fulfill the planned activities.

6.1 FURTHER SUGGESTIONS

- Stopping the increased vehicle pollution, wildlife road fatalities and damage to precious habitat by peoples to start movement towards these areas.
- To carry annual census research projects to ecology and habitat use by peacock, Wolf and Leopard.
- By making provision of veterinary care and cages for injured or sick deformed birds.
- The prolific use of insecticides / pesticides should be checked as these harmful chemicals are detrimental and instrumental for killing of insects / butterflies which are natural prey for the birds.
- Declare the animal as economically valuable
- Enact stricter laws to control the capture or exploitation of females of any endangered species and enforce them.
- Indigenous knowledge of endangered animals should be enlisted in all tribal areas.
- Forest Officals should have frequent coordination with the local inhabitants for checking any poaching/illegal tree felling
- Since the proposed PRLIS project falls under 06 Forest Divisons i.e. Mahbubnagar, Nagarkarnool, Nalagonda, Rangareddy, Vikrabad and Narayanpet Forest Divisions, coordination among all the six (06) Divsions are important to implement the conservation plan and their should be a centralized system for information sharing among all the division related to any wildlife poaching, injury, casulaity, illigal trading and tree felling, etc.
- Captive breeding should be introduced on a commercial scale and value-added products extracted with people's participation. Profits should be equally shared. This may also discourage the illegal trade.

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F. No. 8-43/2017-FC
Government of India
Ministry of Environment, Forests and Climate Change
(Forest Conservation Division)
****

Indira Paryavaran Bhawan,
Aliganj, Jorbagh Road,
New Delhi - 110003.

Dated: 03rd April, 2018

To,

The Special Secretary to Government (Forests)
Environment, Forests, Science & Technology Deptt.,
Government of Telangana State Secretariat,
Hyderabad.

Sub: **Diversion of 205.4811 ha of forest land in Achampet Division of Nagarkurnool District for works of Lift I Pump house (Package-1) and formation of Anjanagiri Reservoir (Package-2), Earth work Excavation & Construction of Tunnel in between Anjanagiri Reservoir at Narlapur (V) and Veerajaneya Reservoir at Yedula (V) (Package- 4) of Palamuru Rangareddy Lift Irrigation Scheme Project in favour of Chief Engineer, PRLIS, Hyderabad.**

Sir,

I am directed to refer to the State Government of Telangana's letter No. 1999/For. 1 (1)/2017 dated 26th May, 2017 on the above mentioned subject, wherein prior approval of the Central Government for diversion of 205.4811 ha of forest land in Achampet Division of Nagarkurnool District for works of Lift – I Pump house (Package-1) and formation of Anjanagiri Reservoir (Package-2), Earth work Excavation & Construction of Tunnel in between Anjanagiri Reservoir at Narlapur (V) and Veerajaneya Reservoir at Yedula (V) (Package- 4) of Palamuru Rangareddy Lift Irrigation Scheme Project in favour of Chief Engineer, PRLIS, Hyderabad was sought in accordance with Section – 2 of the forest (Conservation) Act, 1980. The said proposal has been examined by the Forest Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act.

2. After careful consideration of the proposal of the State Government of Telangana and on the basis of the recommendations of the Forest Advisory Committee, *in-principle approval/Stage-I Clearance* of the Central Government is hereby granted for diversion of 205.4811 ha of forest land under Forest (Conservation) Act, 1980 in Achampet Division of Nagarkurnool District for works of Lift – I Pump house (Package-1) and formation of Anjanagiri Reservoir (Package - 2), Earth work Excavation & Construction of Tunnel in between Anjanagiri Reservoir at Narlapur (V) and Veerajaneya Reservoir at Yedula (V) (Package 4) of Palamuru Rangareddy Lift Irrigation Scheme Project in favour of Chief Engineer, PRLIS, Hyderabad subject to the following conditions:-

(I) Legal status of the diverted forest land shall remain unchanged;

(II) **Compensatory afforestation over the non-forest land, equal in extent to the area of forest land being diverted shall be raised within a period of three years with effect from the date of issue of Stage-II clearance and maintained thereafter in accordance with the approved Plan in consultation with the State Forest Department at the cost of the user agency. At least 1000 saplings per hectares shall be planted over 205.4811 ha. (205481 plants). If it is not possible to plant these many seedlings in the identified DFL, the balance seedlings will be planted in other suitable degraded forest land as per the prescriptions of the Working Plan at the cost of the User agency. In such case CA cost will be revised and duly approved by competent authority and deposited through online in the CAF managed by CAMPA;**

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(iii) 25% of the CA cost additionally will be spent towards Soil and Moisture Conservation activities in the proposed CA area as per site requirement and deposited in CAF, through online;

(iv) The non-forest land identified for raising compensatory afforestation shall be transferred and mutated in favour of the State Forest Department before issue of the Stage - II clearance;

(v) The non-forest land to be transferred and mutated in favour of the State Forest Department for raising Compensatory Afforestation shall be notified as reserved Forest under Section-4 or Protected Forest under Section-29 of the Indian Forest Act, 1927 or under the relevant Section(s) of the local Forest Act;

(vi) The land identified for the purpose of CA shall be clearly depicted on a Survey of India toposheet of 1:50,000 scale;

(vii) The User Agency shall transfer the cost of raising and maintaining the compensatory afforestation at the current wage rate in consultation with State Forest Department in the account of Ad-hoc CAMPA of the concerned State through online portal. The scheme may include appropriate provision for anticipated cost increase for works scheduled for subsequent years;

(viii) The User Agency shall transfer the funds for the Net Present Value (NPV) of the forest land being diverted under this proposal from the User Agency as per the orders of the Hon'ble Supreme Court of India dated 28.03.2008, 24.04.2008 and 09.05.2008 in Writ Petition (Civil) No. 202/1995 and the guidelines issued by this Ministry vide its letter No. 5-3/2007-FC dated 05.02.2009 through online portal of Ad-hoc CAMPA account of the State Concerned;

(ix) At the time of payment of the Net Present Value (NPV) at the then prevailing rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined as per the final decision of the Hon'ble Supreme Court of India;

(x) The State Government shall impose the quantum of penalty as admissible due to violations of provisions of Forest Conservation Act 1980, as per the guidelines issued vide this Ministry's letter no. 11-42/2017-FC dated 29.01.2018 and the payment in this regard shall be deposited, into the account of Ad-hoc CAMPA through web portal of this Ministry;

(xi) The user agency should ensure that the compensatory levies (CA cost, NPV, etc.) are deposited through challan generated online on web portal and deposited in appropriate bank online only. Amount deposited through other mode will not be accepted as compliance of the Stage- I clearance;

(xii) Any fund received from the user agency under the project, except the funds realized for regeneration / demarcation of safety zone, shall be transferred to Ad-hoc CAMPA through Online-portal of Ad-hoc CAMPA account of the State Concerned;

(xiii) The User Agency shall prepare and implement the R & R Plan as per the R&R policy of State Government in consonance with National R & R policy, Government of India before commencement of the project work and implementation. The said R&R plan will be monitored by the state government / Regional office of MoEF & CC along with indicators for monitoring and expected observable milestones.

(xiv) The State Government shall furnish report regarding action taken on the violations including fixing of responsibility on the errant officials and also status of compliance of the

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conditions / penalty imposed by the Committee constituted by State Government under the Chairmanship of Principal Secretary (Forest) vide G.O.No.806, I & CAD (Projects II) Department dated 26.09.2017;

(xv) The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986;

(xvi) The User Agency shall obtain clearance from the Standing Committee of NBWL for areas falling in the protected area and its Eco-Sensitive Zone before commencement of work;

(xvii) The Forest Department shall prepare a Plan of Action to utilize the water potential available nearby for the benefit of forest crop and also to the wild animals at the cost of user agency;

(xviii) A plan for conservation of Wildlife will be made by the user agency in consultation with the PCCF (Wildlife) to be implemented at the cost of user agency;

(xix) This Stage-I approval would also be subject to the outcome of the litigation pending before the Hon'ble NGT/ Courts with respect to this proposal;

(xx) A Catchment Area Treatment Plan as approved by the State Government be implemented by State Forest Department at the project cost;

(xxi) The user agency shall carry out muck disposal at pre-designated sites in such a manner so as to avoid its rolling down with approval plan;

(xxii) The tree felling in the forest area, so diverted, shall only be as per the actual requirement and with prior permission of the competent authority

(xxiii) The User agency shall undertake afforestation along the periphery of the reservoir;

(xxiv) There shall be no tree felling between FRL (Full Reservoir Level) and FRL -4 meters and the forest land located between FRL and the FRL-4 meters may be afforested by planting appropriate indigenous tree species;

(xxv) The User agency shall provide free water for the forestry related projects;

(xxvi) Layout plan of the proposal shall not be changed without the prior approval of the Central Government;

(xxvii) No labour camp shall be established on the forest land;

(xxviii) The forest land shall not be used for any purpose other than that specified in the proposal and under no circumstances be transferred to any other agency, department or person;

(xxix) The State Government shall ensure that the user agency shall provide alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;

(xxx) Boundary of the forest land proposed to be diverted shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, forward and back bearing, distance from pillar to pillar and GPS co-ordinates;

(xxxi) The State Government shall maintain the character of the project as an irrigation project and to ensure continued benefit to the farmers in the command area, no more diversion of water from the project for Industrial projects will be permitted in future;

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(xxxii) The State Government shall complete settlement of rights, in terms of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, if any, on the forest land to be diverted and submit the documentary evidence as prescribed by this Ministry in its letter No. 11-9/1998-FC (pt.) dated 03.08.2009 read with 05.07.2013, in support thereof;

(xxxiii) Action taken by the State Government against erring officials shall be submitted;

(xxxiv) Necessary correction in the revenue record shall be effected so as to include forest land in question which is already notified;

(xxxv) Shape/KML file of 237 ha. land identified for CA shall be submitted;

(xxxvi) The proof of reconciled field records with demarcation shall also be submitted;

(xxxvii) Any other condition that the concerned Regional Office of this Ministry may stipulate, from time to time, in the interest of conservation, protection and development of forests & wildlife;

(xxxviii) The User agency shall submit the annual self -compliance report in respect of the above conditions to the State Government, concerned Regional Office and this Ministry by the end of March of every year regularly; and

(xxxix) The User Agency and the State Government shall ensure compliance to provisions of the all Acts, Rules, Regulations, Guidelines, NOT order (s) and relevant Hon'ble Court Order (s), if any, pertaining to this project for the time being in force, as applicable to the project.

3. After receipt of the report on compliance to the conditions stipulated in the paragraph-2 above from the State Government of Telangana, Final /Stage-II approval for diversion of the said forest under Section-2 of the Forest (Conservation) Act, 1980 will be issued by this Ministry. Transfer of the said forest land to the user agency shall not be effected by the State Government of Telangana till final/stage-II approval for its diversion is issued by this Ministry.

Yours faithfully,

(Nishesh Saxena)
Sr. Assistant Inspector General of Forests (FC)

Copy to:-

1. The Principal Chief Conservator of Forests, Government of Telangana, Hyderabad.
2. The Addl. Principal Chief Conservator of Forests (Central), Regional Office (South Eastern Zone), Chennai.
3. The Nodal Officer, under the forest (Conservation) Act, 1980, Forest Department, Government of Telangana, Hyderabad.
4. User Agency.
5. Monitoring Cell, FC Division, MoEF & CC, New Delhi, for uploading.
6. Guard File.

(Nishesh Saxena)
Sr. Assistant Inspector General of Forests (FC)

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F. No. 8-43/2017-FC
Government of India
Ministry of Environment, Forests and Climate Change
(Forest Conservation Division)

Indira ParyavaranBhawan,
JorBagh Road, Aliganj
New Delhi – 110 003
Dated: 25th January, 2019

To

The Special Secretary to Government,
Environment, Forests, Science
& Technology Department, Secretariat,
Government of Telangana,
Hyderabad.

Sub: Diversion of 205.4811 ha of forest land in Achampet Division of Nagarkurnool District for works of Lift – I Pump house (Package-1) and formation of Anjanagiri Reservoir (Package - 2), Earth work Excavation & Construction of Tunnel in between Anjanagiri Reservoir at Narlapur (V) and Veerajaneya Reservoir at Yedula (V) (Package 4) of Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) Project in favour of Chief Engineer, PRLIS, Hyderabad.-regarding,.

Sir,

I am directed to refer to the Government of Telangana's letter No. 1999/For.I (1)/2017 dated 26th May, 2017 on the above mentioned subject, wherein prior approval of the Central Government under Section 2 of Forest (Conservation) Act, 1980 for diversion of 205.4811 ha of forest land in Achampet Division of Nagarkurnool District for works of Lift – I Pump house (Package-1) and formation of Anjanagiri Reservoir (Package - 2), Earth work Excavation & Construction of Tunnel in between Anjanagiri Reservoir at Narlapur (V) and Veerajaneya Reservoir at Yedula (V) (Package 4) of Palamuru Rangareddy Lift Irrigation Scheme Project in favour of Chief Engineer, PRLIS, Hyderabad, was sought, in accordance with Section-2 of the Forest (Conservation) Act, 1980. After careful consideration of the proposal by the Forest Advisory Committee constituted under Section-3 of the said Act, ***In-principle/ Stage-I*** approval for diversion of the said forest land was accorded by the Ministry vide its letter even number dated 03.04.2018 subject to fulfillment of certain conditions. The State Government has furnished compliance report in respect of the conditions stipulated in the stage-I approval and has requested the Central Government to grant Stage II / final approval.

2. In this connection, I am directed to say that on the basis of the compliance report furnished by the State Government of Telangana's letter No. 1999/For.I (1)/2017 dated 10th January, 2018 *Final approval/Stage-II clearance* of the Central Government is hereby granted under Section-2 of the Forest (Conservation) Act, 1980 for diversion of 205.4811 ha of forest land in Achampet Division of Nagarkurnool District for works of Lift – I Pump house (Package-1) and formation of Anjanagiri Reservoir (Package - 2), Earth work Excavation & Construction of Tunnel in between Anjanagiri Reservoir at Narlapur (V) and Veerajaneya Reservoir at Yedula (V) (Package 4) of Palamuru Rangareddy Lift Irrigation Scheme Project in favour of Chief Engineer, PRLIS, Hyderabad, subject to the following conditions:-

(i) Legal status of the diverted forest land shall remain unchanged;

(ii) The Compensatory afforestation over the non-forest /degraded forest land, equal in extent to the 205.4811 ha. of forest land being diverted shall be raised on identified non-forest land within a period of three years with effect from the date of issue of Stage-II clearance and maintained thereafter in accordance with the approved CA Scheme/Plan by the State Forest Department from the funds already provided by the user agency;

(iii) The State Government shall ensure that the State Forest Department shall implement the approved soil and moisture conservation (SMC) activities on the CA land from the funds already provided by the User Agency;

(iv) *The State Government shall ensure that the penal compensatory afforestation* shall also be raised on identified degraded forest land equal to extent in double the broken up area within three years from the date of Stage II Clearance and maintained thereafter by the State Forest Department from the funds already provided by the user agency.

(v) The State Government shall ensure that the non-forest land to be transferred and mutated in favour of the State Forest Department for raising Compensatory Afforestation shall be notified as reserved Forest under Section-4 or Protected Forest under Section-29 of the Indian Forest Act, 1927 or under the relevant Section(s) of the local Forest Act;

(vi) The State Government shall ensure that the civil structures recommended in the project shall be designed in such a way to allow smooth passage of the wild animals and the user. The Forest Department shall prepare a Plan of Action to utilize the water potential available nearby for the benefit of forest crop and also to the wild animals at the cost of user agency;

(vii) The user agency shall pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India and transfer the same to the ad-hoc CAMPA under intimation to this Ministry.

(viii) *The State Government / User Agency shall ensure* to obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;

(ix) *The State Government / User Agency shall ensure* to raise afforestation alongwith the periphery of the reservoirs and canals;

(x) *The State Government / User Agency shall ensure that* the trees available between full reservoir level (FRL) and FRL—4 meters are not felled;

(xi) *The State Government / User Agency shall ensure* to provide free water for the forestry related projects;

(xii) The State Government / User Agency shall obtain clearance from the Standing Committee of NBWL for areas falling in the protected area and its Eco Sensitive Zone before commencement of work;

(xiii) The State Government shall take appropriate measures in the project area to increase the fodder availability in the forest for wildlife, desilting of tanks and water holes in the forest areas to increase the water availability for wildlife, anti-poaching strategy and Anti-encroachment strategy, provision of salt licks and launching of public awareness programmes.

(xiv) The State Govt. shall follow the regulations on eco sensitive zone, if applicable.

(xv) The order of the NGT and other courts, which may be pending against this proposal, may be complied by the state government and the user agency.

(xvi) The State Government shall ensure that the approved Catchment Area Treatment (CAT) plan is implemented by the State Forest Department from the funds already provided by the user agency.

(xvii) The State Government shall ensure that the Wildlife Conservation Plan duly approved by PCCF (Wildlife) is implemented by the State Forest Department from the funds already provided by the user agency;

(xviii) The State Government shall ensure to prevent illegal occupation/encroachment of forest land by the families to be displaced from the project site, the user agency shall ensure that each family being displaced from the project site actually acquires and settles on non-forest land. Apart from taking other measures to achieve the said objective, as a measure to discourage the project affected families from encroaching into the forest land, payment of annuity for a period of at-least five years at the rate of the minimum wage payable to the unskilled person for 200 person-days per annum to each adult member of the project affected families, on receipt of a certificate signed by a forest officer not below the rank of a Range Officer having jurisdiction over the area where such person has settled after displacement from the project site, should be incorporated in the R & R plan. Payment of the said annuity should be an additionally and not in replacement of any of the benefits to be accrued to the project affected persons, as per the present R&R Plan.

(xix) The State Government shall ensure that the User agency will track location of each displaced family and ensure that none of them encroach/occupy forest land. In support of compliance to this condition at least for five years from the date of taking possession of the forest land, the user agency shall submit an annual certificate to the Principal Chief Conservator of Forests, Telangana that none of the persons displaced from the project land has encroached/ settled on the forest land during the year;

(xx) The State Government and the user agency shall implement the approved R&R Plan as per the R&R Policy of State Government in consonance with National R&R Policy, Government of India before the commencement of the project work. The said R&R Plan will be monitored by the State Government/concerned Regional Office of MoEF& CC, GoI along with indicators for monitoring and expected observable milestones;

(xxi) The State Government shall ensure that the User Agency provides fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;

(xxii) The State Government shall ensure that the boundary of the diverted forest land has been demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS co-ordinates of each pillar;

(xxiii) The State Government shall ensure that the layout plan of the proposal shall not be changed without the prior approval of the Central Government;

(xxiv) The State Government shall ensure that the forest land is not used for any purpose other than that specified in the proposal;

(xxv) The State Government shall ensure that the forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government;

(xxvi) The State Government shall ensure that the water is provided from the reservoir and canals to the Forest Department for raising and maintenance of plantations and nurseries around the site whenever required, free of charge. The quantity and time of supply of water shall be as decided by the Forest Department;

(xxvii) The State Government shall ensure that the User Agency carries out muck disposal at pre-designated sites in such a manner so as to avoid its rolling down and the dumping area for muck disposal shall be stabilized and reclaimed by planting suitable species by the User Agency at the cost of project under the supervision of State Forest Department. Retaining walls and terracing shall be carried out to hold the dumping material in place. Stabilization and reclamation of such dumping sites shall be completed before handing over the same to the State Forest Department in a time bound manner as per Plan;

(xxviii) The State Government shall ensure that the User Agency submits the annual self compliance report in respect of the above conditions to the State Government and to the concerned Regional Office of the Ministry regularly

(xxix) Any other condition that the concerned Regional Office of this Ministry may stipulate, from time to time, in the interest of conservation, protection and development of forests & wildlife.

(xxx) The State Government and the User Agency shall ensure compliance to provisions of all the Acts, Rules, Regulations, Guidelines, and relevant Hon'ble Court Order (s), if any, pertaining to this project for the time being in force, as applicable to the project;

(xxxi) **As per para 3.4 (iii) of Ministry's Guidelines issued under Forest (Conservation) Act, 1980, a Monitoring Committee shall be constituted with a nominee of the Central Government to monitor the conditions being stipulated, including those pertaining to CA are carried out;**

Yours faithfully,

25/07/2019

(Shrawan Kumar Verma)
Dy. Inspector General of Forests

Copy to:

1. The Principal Chief Conservator of Forests, Government of Telangana, Hyderabad.
2. The Nodal Officer (FCA), Office of the PCCF, Government of Telangana, Hyderabad.
3. The Addl. Principal Chief Conservator of Forests (Central), Regional Office (Southern Eastern Zone), Chennai
4. User Agency
5. Monitoring Cell, FC Division, MoEF&CC, New Delhi.
6. Guard File.

25/07/2019

(Shrawan Kumar Verma)
Dy. Inspector General of Forests

GOVERNMENT OF TELANGANA
FOREST DEPARTMENT

From:
Smt. R.Sobha, I.F.S.,
Prl. Chief Conservator of Forests (HoFF) &
Chief Wildlife Warden
Aranya Bhavan
Saifabad, Hyderabad

To:
The Chief Engineer
Irrigation,
Nagarkurnool.

Rc.No. 8025/2017/WL-1, dt: 03.09.2021.

Sir,

Sub:- TSFD – WL – PRLIS Project - Issue of No Objection (NOC) Letter for distance from the Protected Forest and Eco-sensitive Zones for Palamaru Rangareddy Lift Irrigation Scheme in the State of Telangana – NOC issued as requested - Regarding.

Ref:-
1. Chief Engineer, Irrigation, Nagarkurnool Lr. No. CE/Irr/Ngkl/OT1/TS1/ NOC/980/1 Dt. 27.08.2021.
2. PCCF(HoFF), U.O. Note No.2573/2017/FCA-4, dt.02.09.2021.
3. PCCF, Rc. No. 2573/2017/FCA-1, dt. 27.09.2017.

*****

This is to inform that, in the above reference 1st cited, the Chief Engineer, Irrigation, Nagarkurnool has informed that the Govt. of Telangana has accorded administrative approval for the Palamaru Rangareddy Lift Irrigation Scheme to irrigate an Ayacut of 10 lakh acres by lifting water from foreshore of Srisailam project on Krishna river near Yellur in Kolapur Range of Achampet Division.

The Chief Engineer stated that, under phase-I of the proposed project the works taken up are main conduit, series of canals, tunnels, lifts and reservoirs which are under progress. It is also stated that under Phase-II the works to be taken up consists of main canals from the reservoirs, branch canals, distributaries and field channels.

The C.E. informed that the project alignment and main canals do not pass through any area which is within 10 kms of Protected Areas or Eco-sensitive Zones of Protected Areas. In view of this the Chief Engineer has requested this office to issue an "No Objection letter to this effect".

In the U.O. Note of PCCF (HoFF) in 2nd reference cited, it is stated that the Dy. Executive Engineer has furnished KMZ files of the alignment of distributaries, canals, Ayacut of PRLIS on 30.08.2021 through e-mail to the FCA Section. Further, the User Agency informed that, while submitting the proposal for "Diversion of **205.4811 ha** of forest land in Achampet Division of Nagarkurnool District for works of Lift-I Pump house (Package-1) and formation of Anjanagiri Reservoir (Package-2), Earth work Excavation & Construction of Tunnel in between Anjanagiri Reservoir at Narlapur (V) and Veeranjaneya Reservoir at Yedula (V) (Package-4) of **Palamuru Rangareddy Lift Irrigation Scheme Project** in favour of Chief Engineer, PRLIS,

Hyderabad" it has been submitted to Government that the proposed area is falling outside core and buffer areas of Amrabad Tiger Reserve and proposed eco-sensitive zone of Amrabad Tiger Reserve. Accordingly, Stage II (final) approval has been granted.

In the U.O. Note of FCA Section in 2nd reference cited, it is started that, the KMZ file furnished by I&CADD was sent to GIS cell for verification. Upon verification the GIS cell has reported that "On verification of .KMZ files (other than the areas for which forest clearances are granted) sent by DEE, it is observed that the distributaries and main canal are falling outside the protected areas and beyond 10 km from the periphery of the protected areas (WLS & NP), as per the information i.e., proxy GIS layers of forest boundaries available with IT wing".

It is also noted that, in the reference 3rd cited, the PCCF(HoFF) had addressed a letter to the Director General of Forests & SS, MoEF&CC, GoI, in which it is stated that the proposed PRLIS project is located at a distance of 11.95 kms from the boundary of core area of Amarabad Tiger Reserve and the boundary of the Amarabad Wildlife Sanctuary which are co-terminus. It is also stated in the report that, the proposed project is located at a distance of 2.56 kms from the boundary of buffer area of Amarabad Tiger Reserve and at a distance of 1.56 kms from the proposed Eco-sensitive Zone of Amarabad Tiger Reserve. It is also stated that, the proposed project is beyond the deemed 10 kms ESZ from the boundary of core area of Amarabad Tiger Reserve and the boundary of the Sanctuary which are co-terminus.

Therefore, keeping in view the submissions made by the Chief Engineer, Irrigation, Nagarkurnool in reference 1st cited that, the proposed PRLIS does not fall within 10 kms of any Protected Area along the alignment of the project and the findings of GIS cell after verification of the KMZ files submitted by the Dy. E.E., I&CADD in the reference 2nd cited to the effect that, there are no Protected Areas within 10 kms of the proposed project and the letter of PCCF (HoFF) addressed to DG., Forests, MoEF&CC, GoI in reference 3rd cited, this "Letter of No Objection" is issued for the PRLIS.

This "Letter of No Objection" is issued subject to condition that the alignment of canals/ distributaries submitted to the Forest department in KMZ files and in printed map, signed by the Chief Engineer, Irrigation, Nagarkurnool, received on 02.09.2021, is final. Further that, there shall be no change on the ground while execution of work. The "Letter of No Objection" shall be void if any of the above conditions are violated.

Yours faithfully,
Sd/- R. Sobha,
Prl. Chief Conservator of Forests (HoFF)
& Chief Wildlife Warden.

Copy to the PCCF(SF), O/o.PCCF(HoFF) for information.
Copy to the CCF/FDPT, KTR for information and necessary action.
Copy to FCA – 4 for information.

//True copy//

3/9/21

for Prl. Chief Conservator of Forests

ENVIRONMENTAL BASE LINE DATA GENERATION REPORT

Season -Monsoon - 2019

Client

Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) Canal Network – Phase II (Irrigation)

Mahbubnagar District, Telangana State

Sponsor

M/s. Voyants Solutions Private Limited.

403, 4th Floor, Park Centre, Sector-30,
Opp. 32nd Milestone, NH-8, Gurgaon-122001, Haryana.

CONDUCTED BY

VISON LABS
ENVIRONMENTAL CONSULTANTS & ANALYTICAL SERVICES

Recognised by MoEF&CC, ISO 9001:2015, OHSAS 18001:2007
H.No.16-11-23/37/A, 2nd Floor,
Above Andhra Bank, Opp: R.T.A Office,
Musaarambagh, Malakpet, Hyderabad.
Tel Fax: 040 – 24544320, 24558363.
Website: visonlabs.com
Email info@visonlabs.com & vison.labs@gmail.com

R E P O R T

Season -Monsoon - 2019

FOR

Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) Canal Network – Phase II (Irrigation) Mahbubnagar District, Telangana State

Sponsor

Voyants Solutions Private Limited.

403, 4th Floor, Park Centre, Sector-30,
Opp. 32nd Milestone, NH-8, Gurgaon-122001, Haryana.

For and behalf of Vison Labs

Approved By : T Laxmikanth Reddy

Signed :
Position : Chief Executive

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SCOPE OF WORK

Monitoring of Ambient Air Quality, Water quality, Soil quality and Ambient Noise Quality measurement are part of the scope of work given to M/s Vison Labs. The environmental Monitoring has been carried out at the following locations:

A] Ambient Air Quality Locations:

Location Code	Location Name	Co-Ordinates
AAQ-1	Boin Palli Village	16°44'28.05"N, 78°20'46.55"E
AAQ-2	Munimokesham Village	16°50'46.30"N, 77°51'5.10"E
AAQ-3	Madhanapuram Village	16°55'38.81"N, 78°44'13.16"E
AAQ-4	Bandanadi Gudur Village	17° 5'53.30"N, 78°30'18.60"E
AAQ-5	Medipalle Kalan Village	17°13'53.28"N , 78° 0'41.00"E
AAQ-6	Yenkepalle Village	17° 9'6.10"N, 77°38'0.80"E

B] Ambient Noise Quality Locations:

Location Code	Noise Level Locations Name	Date Of Monitoring	Co-Ordinates
N-1	Boin Palli Village	14.08.2019	16°44'22.89"N, 78°20'51.91"E
N-2	Munimokesham Village	16.08.2019	16°50'46.10"N, 77°51'5.70"E
N-3	Madhanapuram Village	13.08.2019	16°55'39.15"N, 78°44'11.58"E
N-4	Bandanadi Gudur Village	19.08.2019	17° 5'51.93"N, 78°30'22.08"E
N-5	Medipalle Kalan Village	21.08.2019	17°13'53.17"N, 78° 0'41.10"E
N-6	Yenkepalle Village	08.08.2019	17° 9'9.30"N, 77°38'2.65"E

C] Ground Water Quality Location:

Location Code	Ground Water Location Names	Date of Sampling	Co-Ordinates
GW-1	Boin Palli Village	21.08.2019	16°44'32.94"N, 78°20'53.19"E
GW-2	Munimokesham Village	20.08.2019	16°50'47.40"N, 77°51'4.60"E
GW-3	Madhanapuram Village	21.08.2019	16°55'41.37"N, 78°44'11.74"E
GW-4	Bandanadi Gudur Village	20.08.2019	17°5'54.17"N, 78°30'19.87"E
GW-5	Medipalle Kalan Village	21.08.2019	17°13'55.34"N, 78° 0'45.35"E
GW-6	Yenkepalle Village	21.08.2019	17°9'8.30"N, 77°38'2.17"E

D] Surface Water Quality Location:

Location Code	Surface Water Location Names	Date of Sampling	Co-Ordinates
SW1	BoinPalli Village	21.08.2019	16°44'18.06"N, 78°20'56.08"E
SW2	Munimokesham Village	21.08.2019	16°50'43.78"N, 77°51'11.54"E
SW3	Madhanapuram Village	21.08.2019	16°55'40.95"N, 78°44'5.86"E
SW4	BandanadiGudur Village	23.08.2019	17° 6'20.63"N, 78°30'21.48"E
SW5	Medipalle Kalan Village	23.08.2019	17°14'26.75"N, 78° 2'58.44"E
SW6	Yenkepalle Village	22.08.2019	17° 9'8.65"N, 77°38'8.41"E
SW7	500 m Upstream of Water sourcing area	23.08.2019	16° 6'27.61"N, 78°24'29.72"E
SW8	500 m downstream of Water sourcing area	23.08.2019	16° 5'39.45"N, 78°23'57.99"E

E] Soil Quality Location

Location Code	Soil Location Name	Sample Collection Dates	Co-Ordinates
S-1	Boin Palli Village	21.08.2019	16°44'27.64"N, 78°20'41.87"E
S-2	Munimokesham Village	21.08.2019	16°50'42.88"N, 77°51'9.17"E
S-3	Madhanapuram Village	21.08.2019	16°55'43.62"N, 78°44'4.32"E
S-4	Bandanadi Gudur Village	21.08.2019	17° 5'53.58"N, 78°30'16.21"E
S-5	Medipalle Kalan Village	21.08.2019	17°13'53.37"N, 78° 0'46.54"E
S-6	Yenkepalle Village	21.08.2019	17° 8'57.69"N, 77°37'56.65"E

MONITORING AND ANALYSIS METHODOLOGY

The consultant had Pre-identified the monitoring stations for Air, Water and Noise. Time bound program for carrying out fieldwork was prepared and was followed as far as possible. The IS methods are followed to decide the monitoring stations, analysis of different samples and also alternative methods are used, where the cross verification is required.

Ambient Air Quality Monitoring:

Respirable Dust Samplers (RDS) with gaseous attachment have been used for PM10/PM2.5 Sampling. RDS with Gaseous attachment assembly is used for the collection of gaseous pollutants such as SO_2, NO_2, NH_3, O_3, Bap, Benzene, As, Ni, Pb and CO.

Ambient Air monitoring instruments

Instrument	Make	Model No.	Range and Sensitivity	
			PM10/PM2.5	Gases
Respirable Dust Sampler (RDS)	M/s. ECO Tech	AAS-271	PM_{10} 2.3 m^3/hour $PM_{2.5}$ 1.0 m^3/hour ±0.02 m^3/hour	0 – 3 LPM ± 0.2 LPM

Testing Method to be followed for Ambient Air Quality

Particular		Testing Method to be Followed
Ambient Air Monitoring Parameter		
A	PM_{10}	IS-5182 (part – IV) 2006
B	$PM_{2.5}$	EPA - Quality Assurance Guidance Document 2.12
C	SO_2 (Sulfur Dioxide)	IS 5182 (Part – II) 2001, with Improved West & Gaeke Method
D	NO_2 (Nitrogen Dioxide)	Modified Jacobs – Hochheiser Method / Arsenite Method
E	CO (Carbon Monoxide)	Indicator Tube Method/CO Analyzer

Noise Level Measurement

Instant sound level meter is used for the collection of data related to noise at an interval of one hour per reading. Noise level for 24 hours was conducted location.

Noise (Sound) Measuring Instrument

Instrument	Make	Model No.	Detection Limit
Integrated Sound Level Measurement Instrument Standard Accessories	HTC	SL-1352	Lower level: 35-80dB(A) Higher level: 80-130dB(A)

Testing Method to be followed

Sr.No.	Particular		Testing Method to be Followed
	Noise Level Measurement		
1	A	Noise Level in dB (A) for continuous 24 hours at 1 hour interval	Comply With IEC61672-1 Class - 2 Standard

Water Quality Survey

Water samples were collected in Pre-sterilized sampling container. Chemical and Metals analysis was carried out as per standard Methods for water Analysis, Published by BIS, AWWA, APHA, etc.

Soil Quality Survey

Soil samples were collected in sealed sampling Polyethylene covers. Chemical and Metals analysis was carried out as per standard Methods for Soil Analysis, Published by BIS etc.

Quality Assurance

VISON LABS is accredited by Ministry Of Environment & forests, GOVT. OF INDIA and follows quality systems as per ISO 9001:2015. The QA/QC procedures are laid prior to sample collection and laboratory analysis. It includes the standard procedures of sample collection, preservation, transportation and laboratory analysis with all documented procedures and continuous monitoring of Quality Control Division.

Results of Survey Data

The Survey results of Ambient Air Quality, Ambient Noise Monitoring and Water Sampling analysis are presented below

Ambient Air Quality Monitoring

The Ambient Air Quality has been monitored at Six locations. The table showing Ambient Air Quality is present in **Table -1 to Table 6** respectively.

TABLE-1

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Boin Palli Village (AAQ1)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
August - 2019						
1st Week	05.08.2019	27.6	15.5	4.3	11.3	<1.0
	06.08.2019	30.3	16.9	4.2	10.5	<1.0
2nd Week	12.08.2019	33.3	18.6	4.3	10.9	<1.0
	13.08.2019	30.9	17.2	4.1	11.6	<1.0
3rd Week	19.08.2019	29.6	16.6	4.6	11.4	<1.0
	20.08.2019	26.6	14.9	4.1	10.8	<1.0
4th Week	26.08.2019	33.3	18.6	4.2	11.6	<1.0
	27.08.2019	30.0	16.7	4.0	10.8	<1.0
Arithmetic Mean		**30.2**	**16.9**	**4.2**	**11.1**	**<1.0**
Maximum		**33.3**	**18.6**	**4.6**	**11.6**	**<1.0**
Minimum		**26.6**	**14.9**	**4.0**	**10.5**	**<1.0**
Percentile Values						
50th percentile		**30.2**	**16.8**	**4.2**	**11.1**	**<1.0**
98th percentile		**33.3**	**18.6**	**4.6**	**11.6**	**<1.0**

TABLE-2

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Munimokesham Village (AAQ-2)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
August - 2019						
1st Week	07.08.2019	22.6	12.2	4.2	9.6	<1.0
	08.08.2019	20.9	11.3	4.3	9.3	<1.0
2nd Week	14.08.2019	21.9	11.8	4.1	8.9	<1.0
	15.08.2019	20.2	10.8	4.3	9.6	<1.0
3rd Week	21.08.2019	21.0	11.3	4.2	10.1	<1.0
	22.08.2019	21.1	11.4	4.6	8.8	<1.0
4th Week	28.08.2019	24.0	13.0	4.1	10.5	<1.0
	29.08.2019	23.3	12.4	4.1	9.9	<1.0
Arithmetic Mean		**21.9**	**11.8**	**4.2**	**9.6**	**<1.0**
Maximum		**24**	**13**	**4.6**	**10.5**	**<1.0**
Minimum		**20.2**	**10.8**	**4.1**	**8.8**	**<1.0**
Percentile Values						
50th percentile		**21.5**	**11.6**	**4.2**	**9.6**	**<1.0**
98th percentile		**23.9**	**12.9**	**4.6**	**10.4**	**<1.0**

TABLE-3

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Madhanapuram Village (AAQ-3)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
August - 2019						
1st Week	05.08.2019	18.8	10.5	4.2	8.2	<1.0
	06.08.2019	18.6	10.1	4.1	9.0	<1.0
2nd Week	12.08.2019	18.7	9.9	4.0	7.9	<1.0
	13.08.2019	19.2	11.3	4.1	9.4	<1.0
3rd Week	19.08.2019	20.2	10.9	4.3	7.9	<1.0
	20.08.2019	18.3	9.9	4.0	8.8	<1.0
4th Week	26.08.2019	19.1	10.3	4.0	8.1	<1.0
	27.08.2019	20.3	10.2	4.1	9.0	<1.0
Arithmetic Mean		**19.2**	**10.3**	**4.1**	**8.5**	**<1.0**
Maximum		**20.3**	**11.3**	**4.3**	**9.4**	**<1.0**
Minimum		**18.3**	**9.9**	**4.0**	**7.9**	**<1.0**
Percentile Values						
50th percentile		**19.0**	**10.3**	**4.1**	**8.5**	**<1.0**
98th percentile		**20.3**	**10.9**	**4.3**	**9.3**	**<1.0**

TABLE-4

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Bandanadi Gudur Village (AAQ-4)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
August - 2019						
1st Week	05.08.2019	21.6	11.9	4.1	9.1	<1.0
	06.08.2019	20.0	11.6	<4.0	8.4	<1.0
2nd Week	12.08.2019	19.5	10.5	4.1	9.0	<1.0
	13.08.2019	21.5	10.3	<4.0	8.5	<1.0
3rd Week	19.08.2019	18.9	10.7	<4.0	8.3	<1.0
	20.08.2019	20.4	11.5	4.2	9.2	<1.0
4th Week	26.08.2019	22.3	11.7	4.2	8.5	<1.0
	27.08.2019	21.7	10.3	4.0	8.1	<1.0
Arithmetic Mean		**20.7**	**11.1**	**4.1**	**8.6**	**<1.0**
Maximum		**22.3**	**11.9**	**4.2**	**9.2**	**<1.0**
Minimum		**18.9**	**10.3**	**<4.0**	**8.1**	**<1.0**
Percentile Values						
50th percentile		**21.0**	**11.1**	**4.1**	**8.5**	**<1.0**
98th percentile		**22.2**	**11.9**	**4.2**	**9.2**	**<1.0**

TABLE-5

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Medipalle Kalan Village (AAQ-5)

S.No	Date of Sampling	PM 10 µg/m³	PM 2.5 µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
August - 2019						
1st Week	07.08.2019	22.3	13.6	4.2	8.9	<1.0
	08.08.2019	20.9	11.8	4.2	9.0	<1.0
2nd Week	14.08.2019	21.5	12.3	4.3	8.6	<1.0
	15.08.2019	18.9	9.9	4.3	8.1	<1.0
3rd Week	21.08.2019	20.5	10.0	4.2	7.9	<1.0
	22.08.2019	22.4	11.7	4.2	8.6	<1.0
4th Week	28.08.2019	19.8	9.9	4.1	9.3	<1.0
	29.08.2019	20.2	10.1	4.1	8.0	<1.0
Arithmetic Mean		**20.8**	**11.2**	**4.2**	**8.6**	**<1.0**
Maximum		**22.4**	**13.6**	**4.3**	**9.3**	**<1.0**
Minimum		**18.9**	**9.9**	**4.1**	**7.9**	**<1.0**
Percentile Values						
50th percentile		**20.7**	**10.9**	**4.2**	**8.6**	**<1.0**
98th percentile		**22.4**	**13.4**	**4.3**	**9.3**	**<1.0**

TABLE-6

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Yenkepalle Village (AAQ-6)

S.No	Date of Sampling	PM 10 µg/m³	PM 2.5 µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
August - 2019						
1st Week	07.08.2019	24.5	13.5	4.2	10.9	<1.0
	08.08.2019	23.1	12.8	<4.0	12.0	<1.0
2nd Week	14.08.2019	22.8	11.9	4.4	11.2	<1.0
	15.08.2019	21.6	11.9	4.3	9.5	<1.0
3rd Week	21.08.2019	23.4	12.5	<4.0	10.4	<1.0
	22.08.2019	24.5	10.8	5.4	11.8	<1.0
4th Week	28.08.2019	23.6	11.8	4.5	13.0	<1.0
	29.08.2019	21.5	12.3	5.3	12.2	<1.0
Arithmetic Mean		**23.1**	**12.2**	**4.7**	**11.4**	**<1.0**
Maximum		**24.5**	**13.5**	**5.4**	**13**	**<1.0**
Minimum		**21.5**	**10.8**	**<4.0**	**9.5**	**<1.0**
Percentile Values						
50th percentile		**23.3**	**12.1**	**4.5**	**11.5**	**<1.0**
98th percentile		**24.5**	**13.4**	**5.3**	**12.9**	**<1.0**

AMBIENT NOISE LEVELS IN THE STUDY AREA

The statistical analysis is done for measured noise levels at Six locations in the study area. The Noise Readings are analyzed for L_{day} and L_{night}, The statistical analysis results are given in **TABLE-7**

TABLE-7

Ambient Noise Quality Locations

Location Code	Noise Level Locations Name	Date Of Monitoring	Co-Ordinates
N-1	Boin Palli Village	14.08.2019	16°44'32.59"N, 78°20'51.27"E
N-2	Munimokesham Village	16.08.2019	16°50'49.96"N, 77°51'0.49"E
N-3	Madhanapuram Village	13.08.2019	16°55'42.94"N, 78°44'4.20"E
N-4	Bandanadi Gudur Village	19.08.2019	17° 5'52.18"N, 78°30'16.95"E
N-5	Medipalle Kalan Village	21.08.2019	17°13'52.63"N, 78° 0'49.94"E
N-6	Yenkepalle Village	08.08.2019	17° 8'57.69"N, 77°37'56.65"E

AMBIENT NOISE LEVELS IN THE STUDY AREA

All the values are expressed in dB (A)

Time	N-1	N-2	N-3	N-4	N-5	N-6
HOURS						
06:00 – 07:00	40.8	39.9	38	36.3	39.8	38.1
07:00 – 08:00	45.9	42.8	41.1	38.5	41.8	40.7
08:00 – 09:00	48	44.4	42.8	40	44.2	41.8
09:00 – 10:00	45.6	46	44.4	42.2	46.2	45.7
10:00 – 11:00	44.5	44.6	44.1	44.1	44.0	45.8
11:00 – 12:00	44.4	44.0	42.5	44.7	43.6	44.5
12:00 – 13:00	46.0	40.7	41.2	41	41.5	43.3
13:00 – 14:00	42.5	39.9	43.8	40.3	44.2	41.8
14:00 – 15:00	44.0	41.6	45.3	41.9	41.2	39.2
15:00 – 16:00	46.1	44.9	42.7	43.8	45.7	40.7
16:00 – 17:00	47.0	46.1	45.5	45.4	43.0	43.8
17:00 – 18:00	43.9	47.0	46.2	43.2	41.2	41.8
18:00 – 19:00	42.3	43.6	43.7	41.6	42.9	44.6
19:00 – 20:00	40.9	41.3	40.8	40.3	43.9	41.1
20:00 – 21:00	40.2	38.7	39.0	38.0	39.6	39.8
21:00 – 22:00	37.7	36.2	36.5	35.5	37.4	37.6
22:00 – 23:00	40.8	39.9	38.0	36.3	39.8	38.1
23:00 – 24:00	45.9	42.8	41.1	38.5	41.8	40.7
24:00 – 01:00	48.0	44.4	42.8	40.0	44.2	41.8
01:00 – 02:00	45.6	46.0	44.4	42.2	46.2	45.7
02:00 – 03:00	44.5	44.6	44.1	44.1	44.0	45.8
03:00 – 04:00	44.4	44.0	42.5	44.7	43.6	44.5
04:00 – 05:00	46.0	40.7	41.2	41.0	41.5	43.3
05:00 – 06:00	42.5	39.9	43.8	40.3	44.2	41.8
L Day	**44.5**	**43.5**	**43.1**	**41.9**	**43.1**	**42.6**
L Night	**34.4**	**32.8**	**33.3**	**32.1**	**32.8**	**33.3**

Observations

a) Day Time Noise Levels (L_{day})

The daytime (L_{day}) noise levels are observed to be in the range of 44.5 – 41.9 dB (A).

b) Night time Noise Levels (L_{night})

The nighttime (L_{night}) Noise levels were observed to be in the range of 34.4 – 32.1 dB (A).

Ground Water Quality

Six Ground water samples was collected and analyzed. The analytical results are given in **TABLE-8 to TABLE – 9**

TABLE-8

Location Code	Bore Well Location	Date of Sampling
GW-1	BoinPalli Village	21.08.2019
GW-2	Munimokesham Village	20.08.2019
GW-3	Madhanapuram Village	21.08.2019

GROUND WATER QUALITY ANALYSIS RESULTS

S.No.	Parameter	Units	Requirement (Desirable Limits) Max	Permissible Limits in the Absence of Alternate Source Max	GW-1	GW-2	GW-3
1.	pH at 25 ^oC	-	6.5 – 8.5	NR	7.29	8.12	7.12
2.	Color	Hazen	5	15	<01	<01	<01
3.	Turbidity	NTU	1	5	1.45	1.60	1.38
4.	TSS	mg/l			5	6	5
5.	Total Dissolve solids	mg/l	500	2000	1122	314	302
6.	Total Hardness as $CaCO_3$	mg/l	200	600	623	98	141
7.	Total Alkalinity	mg/l	200	600	303	98	148
8.	Calcium as Ca	mg/l	75	200	138	23	33
9.	Magnesium as Mg	mg/l	30	100	66.9	9.8	13.8
10.	Chloride as Cl	mg/l	250	1000	241.9	53.3	24.9
11.	Residual Free Chlorine	mg/l	0.2	1.0	<0.001	<0.001	<0.001
12.	Phenolic Compounds	mg/l	0.001	0.002	<0.001	<0.001	<0.001
13.	Mineral Oil	mg/l	0.5	No relaxation	<0.01	<0.01	<0.01
14.	Sulphate as SO_4	mg/l	200	400	209.7	52.9	27.3
15.	Fluorides as F^-	mg/l	1.0	1.5	0.8	0.3	0.3
16.	Nitrates as NO_3	mg/l	45	No relaxation	10.3	4.2	4.1
17.	Iron as Fe	mg/l	0.3	No relaxation	0.2	0.1	0.1
18.	Zinc as Zn	mg/l	5	15	<0.001	<0.001	<0.001
19.	Lead as Pb	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001
20.	Arsenic as orc	mg/l	0.01	0.05	<0.001	<0.001	<0.001
21.	Mercury as Hg	mg/l	0.001	No relaxation	<0.0001	<0.0001	<0.0001
22.	Cadmium as Cd	mg/l	0.003	No relaxation	<0.001	<0.001	<0.001
23.	Total Chromium	mg/l	0.05	No relaxation	<0.0001	<0.0001	<0.0001
24.	Copper as Cu	mg/l	0.05	1.5	0.005	<0.001	<0.001
25.	Manganese as Mn	mg/l	0.1	0.3	<0.001	<0.001	<0.001
26.	Selenium as Se	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001
27.	Cyanide as CN	mg/l	0.05	No relaxation	<0.001	<0.001	<0.001
28.	Aluminium as Al	mg/l	0.03	0.2	<0.001	<0.001	<0.001
29.	Boron as B	mg/l	0.5	1.0	<0.001	<0.001	<0.001
30.	Pesticide Residue	µg/L	--	--	<0.1	<0.1	<0.1
31.	Coli form	MPN/250ml	Should not be detected	Should not be detected	Not detected	Not detected	Not detected
32.	E. Coli	MPN/250ml	Should not be detected	Should not be detected	Not detected	Not detected	Not detected

Results & Conclusions

The sampling and analysis was done as per standard methods prescribed 3025 and APHA 23nd ed-2017.

TABLE-9
Ground Water Quality

Location Code	Bore Well Location	Date of Sampling
GW-4	BandanadiGudur Village	20.08.2019
GW-5	Medipalle Kalan Village	21.08.2019
GW-6	Yenkepalle Village	21.08.2019

GROUND WATER QUALITY ANALYSIS RESULTS

S.No.	Parameter	Units	Requirement (Desirable Limits)	Permissible Limits in the Absence of Alternate Source	GW-4	GW-5	GW-6
1.	pH at 25 ^oC	-	6.5 – 8.5	NR	7.23	7.68	7.45
2.	Color	Hazen	5	15	<01	<01	<01
3.	Turbidity	NTU	1	5	1.23	1.32	1.64
4.	TSS	mg/l			4	4	6
5.	Total Dissolve solids	mg/l	500	2000	568	541	563
6.	Total Hardness as $CaCO_3$	mg/l	200	600	326	329	332
7.	Total Alkalinity	mg/l	200	600	238	328	295
8.	Calcium as Ca	mg/l	75	200	92	72	69
9.	Magnesium as Mg	mg/l	30	100	23.6	39.4	37.4
10.	Chloride as Cl	mg/l	250	1000	59.2	20.5	61.2
11	Residual Free Chlorine	mg/l	0.2	1.0	<0.02	<0.02	<0.02
12	Phenolic Compounds	mg/l	0.001	0.002	<0.001	<0.001	<0.001
13.	Mineral Oil	mg/l	0.5	No relaxation	<0.01	<0.01	<0.01
14	Sulphate as SO_4	mg/l	200	400	69.1	27.4	22.3
15	Fluorides as F^-	mg/l	1.0	1.5	0.4	0.5	0.6
16	Nitrates as NO_3	mg/l	45	No relaxation	7.3	6.4	7.7
17	Iron as Fe	mg/l	0.3	No relaxation	0.1	0.1	0.1
18	Zinc as Zn	mg/l	5	15	<0.001	<0.001	0.011
19	Lead as Pb	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001
20	Arsenic as orc	mg/l	0.01	0.05	<0.001	<0.001	<0.001
21	Mercury as Hg	mg/l	0.001	No relaxation	<0.0001	<0.0001	<0.0001
22	Cadmium as Cd	mg/l	0.003	No relaxation	<0.001	<0.001	<0.001
23	Total Chromium	mg/l	0.05	No relaxation	<0.0001	<0.0001	<0.0001
24	Copper as Cu	mg/l	0.05	1.5	<0.0001	<0.0001	<0.0001
25	Manganese as Mn	mg/l	0.1	0.3	<0.001	<0.001	<0.001
26	Selenium as Se	mg/l	0.01	No relaxation	<0.0001	<0.0001	<0.0001
27	Cyanide as CN	mg/l	0.05	No relaxation	0.06	<0.001	<0.001
28	Aluminium as Al	mg/l	0.03	0.2	<0.001	<0.001	<0.001
29	Boron as B	mg/l	0.5	1.0	<0.001	<0.001	<0.001
30	Pesticide Residue	µg/L	--	--	<0.001	<0.001	<0.001
31	Coli form	MPN/250ml	Should not be detected	Should not be detected	<0.001	<0.001	<0.001
32	E. Coli	MPN/250ml	Should not be detected	Should not be detected	0.008	0.004	0.018

Results & Conclusions

The sampling and analysis was done as per standard methods prescribed 3025 and APHA 23nd ed-2017.

Surface Water Quality

Six Surface water sample was collected and analyzed. The analytical results are given in **TABLE-10**

TABLE-10

Location Code	Location Name	Sample Collection Dates
SW1	Surface Water Collected at Boinpalli Village	21.08.2019
SW-2	Surface Water Collected at Munimokesham Village	21.08.2019
SW-3	Surface Water Collected at Madhanapuram Village	21.08.2019
SW-4	Surface Water Collected at BandanadiGudur Village	23.08.2019
SW-5	Surface Water Collected at Medipalle Kalan Village	23.08.2019
SW-6	Surface Water Collected at Yenkepalle Village	22.08.2019
SW7	500 m Upstream of Water sourcing area	23.08.2019
SW8	500 m downstream of Water sourcing area	23.08.2019

TEST RESULTES

S.No	Parameter	Units	IS:2296 Class C Limits	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8
1.	pH at 25 ^oC	-	6.5 – 8.5	8.15	7.87	8.10	7.76	7.87	7.91	8.32	8.45
2.	Color	Hazen	300	50	40	30	50	40	30	80	80
3.	Turbidity	NTU	--	16.5	12.4	9.6	11.7	13.6	8.30	26.4	42.6
4.	Total Dissolve solids	mg/l	1500	151	218	218	181	190	162	149	162
5.	EC	µS/cm		151	218	218	181	190	162	149	162
6.	Total Hardness as $CaCO_3$	mg/l	--	82	120	130	102	100	84	60	50
7.	Total Alkalinity	mg/l	--	66	100	120	85	94	70	55	50
8.	Calcium as Ca	mg/l	--	20	28.0	28.4	24.5	20.0	20.4	14.0	12
9.	Magnesium as Mg	mg/l	--	7.9	12.0	14.8	9.6	12.5	7.2	5.8	4.8
10.	Sodium as Na	mg/l		15	21	23	19	15	16	12	10
11	Chloride as Cl	mg/l	600	24.6	35.0	50.0	30.0	35.0	30.0	20	20
12	Residual Free Chlorine	mg/l	--	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
13.	Phenolic Compounds	mg/l	0.005	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
14	Mineral Oil	mg/l	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15	Sulphate as SO_4	mg/l	400	18.5	31.4	21.6	34.3	32.0	23.9	32	37
16	Fluorides as F^-	mg/l	1.5	0.11	0.20	0.18	0.14	0.14	0.10	0.20	0.20
17	Nitrates as NO_3	mg/l	50	2.6	3.8	4.0	3.1	3.4	3.1	3.1	3.1
18	Iron as Fe	mg/l	50	0.02	0.04	0.06	0.04	0.04	0.04	0.06	0.06
19	Zinc as Zn	mg/l	15	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20	Lead as Pb	mg/l	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21	Arsenic as orc	mg/l	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Mercury as Hg	mg/l		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
23	Cadmium as Cd	mg/l	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24	Total Chromium	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
25	Copper as Cu	mg/l	1.5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26	Manganese as Mn	mg/l	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27	Selenium as Se	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Cyanide as CN	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
29	Aluminum as Al	mg/l	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
30	Boron as B	mg/l	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
31	Pesticide Residue	µg/L	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
32	Dissolved Oxygen	mg/l	4.0	3.7	3.2	3.1	2.9	3.0	2.8	8.9	9.7
33	Chemical Oxygen Demand	mg/l	--	20	30	30	40	20	30	12	14
34	Biochemical oxygen Demand	mg/l	3.0	06	08	07	09	07	06	<3.0	<3.0
35	SAR			0.72	0.84	0.87	0.83	0.65	0.78	0.68	0.61
36	Coliform	MPN/250ml	Should Not > 5000	2500	1800	1200	900	2100	1200	455	630
37	E. Coli	MPN/250ml	--	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Results & Conclusions

The sampling and analysis were done as per standard methods prescribed IS: 3025 and APHA 23nd ed-2017.

Soil Quality Analysis

Six Soil samples was collected and analyzed. The analytical results are given in below **Table-11 to Table-12**

Table-11

Soil Quality Location:

Location Code	Soil Sampling Location	Sampling dates
S-1	Boin Palli Village	21.08.2019
S-2	Munimokesham Village	21.08.2019
S-3	Madhanapuram Village	21.08.2019
S-4	Bandanadi Gudur Village	21.08.2019

SOIL TEST RESULTS

S.No	Parameter	Units	S-1	S-2	S-3	S-4
1.	Texture	-	Clay Loam	Loam	Loam	Clay Loam
2.	Sand	%	43.6	38.0	40.4	39.6
3.	Silt	%	26.1	38.6	34.8	33.0
4.	Clay	%	30.3	23.4	24.8	27.4
5.	pH (10% Slurry)	-	7.20	7.61	7.34	7.40
6.	El. Conductivity	µs/cm	218	268	231	248
7.	Organic Matter	%	0.86	1.01	0.88	0.94
8.	Bulk density	gm/cc	1.45	1.68	1.65	1.40
9.	Porosity	% v/v	46.4	38.3	37.6	45.9
10.	S.A. R	-	0.27	0.29	0.34	0.23
11.	Calcium as Ca	mg/kg	1770	1795	1686	1810
12.	Magnesium as Mg	mg/kg	255	264	235	265
13.	Sodium as Na	mg/kg	28	31	35	25
14.	Potassium as K	mg/kg	140	136	120	117
15.	Phosphorus as P	mg/kg	8.3	7.4	9.6	9.4
16.	Chloride as Cl	mg/kg	71.2	42.6	71.9	67.1
17.	Zinc as Zn	mg/kg	1.28	1.86	1.22	1.23
18.	Copper as Cu.	mg/kg	1.35	1.48	1.28	1.6
19.	Iron as Fe	mg/kg	12.30	14.65	12.5	11.2
20.	Nitrogen as N	mg/kg	103.6	92.7	80.9	101.1
21.	Organic Carbon	%	0.51	0.57	0.49	0.57
22.	Sulphate as SO4	mg/kg	86.9	104.25	82.05	82.25
23.	Sulphur as S	mg/kg	18.3	15.65	22.31	18.15
24.	Fluoride as F	mg/kg	2.63	3.44	2.9	3.1
25.	Selenium as Se	mg/kg	<0.1	<0.1	<0.1	<0.1
26.	Manganese as Mn	mg/kg	7.75	10.7	9.5	9.41
27.	Chromium as Cr	mg/kg	6.7	5.4	6.3	6.8
28.	Nickel as Ni	mg/kg	10.05	11.85	13.3	11.1
29.	CEC	meq/100g	8.3	4.7	6.9	6.7

Note:

The sampling and analysis was done as per standard methods prescribed in **BIS**.

Table-12
Soil Quality Location:

Location Code	Soil Sampling Location	Sampling dates
S-5	Medipalle Kalan Village	21.08.2019
S-6	Yenkepalle Village	21.08.2019

SOIL TEST RESULTS

S.No	Parameter	Units	S-5	S-6
1	Texture	-	Clay Loam	Clay Loam
2	Sand	%	33.2	32.0
3	Silt	%	32.4	32.2
4	Clay	%	34.4	35.8
5	pH (10% Slurry)	-	7.45	7.28
6	El. Conductivity	µs/cm	263	274
7	Organic Matter	%	1.12	1.10
8	Bulk density	gm/cc	0.97	0.88
9	Porosity	% v/v	63.2	66.7
10	S.A. R	-	0.36	0.26
11	Calcium as Ca	mg/kg	1912	1825
12	Magnesium as Mg	mg/kg	238	305
13	Sodium as Na	mg/kg	38	29
14	Potassium as K	mg/kg	150	164
15	Phosphorus as P	mg/kg	9.5	9.3
16	Chloride as Cl	mg/kg	45.8	78.7
17	Zinc as Zn	mg/kg	1.45	1.15
18	Copper as Cu.	mg/kg	1.8	2.0
19	Iron as Fe	mg/kg	16.4	10.5
20	Nitrogen as N	mg/kg	120.1	151.5
21	Organic Carbon	%	0.64	0.61
22	Sulphate as SO4	mg/kg	74.8	80.3
23	Sulphur as S	mg/kg	16.26	16.67
24	Fluoride as F	mg/kg	2.6	3.5
25	Selenium as Se	mg/kg	<0.1	<0.1
26	Manganese as Mn	mg/kg	12.25	14.25
27	Chromium as Cr	mg/kg	4.6	5.4
28	Nickel as Ni	mg/kg	9.35	10.37
29	CEC	meq/100g	6.4	8.3

Note:
The sampling and analysis was done as per standard methods prescribed in **BIS**.

PHOTO GRAPHS AT THE TIME OF SAMPLING

Prepared by

Recognised by MoEF&CC, ISO 9001:2015, OHSAS 18001:2007
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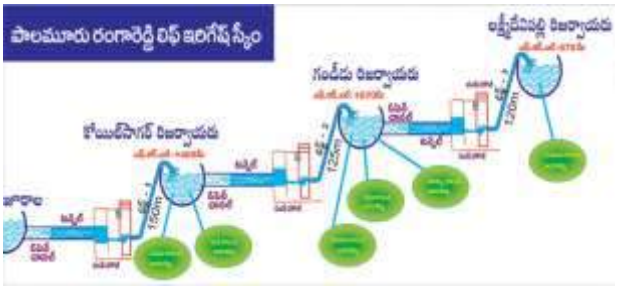
ENVIRONMENTAL DATA GENERATION REPORT

Season: Post-Monsoon - 2019

Client

Palamuru Rangareddy Lift Irrigation Scheme (PRLIS)
Canal Network – Phase II (Irrigation)
Mhabubnagar District, Telangana State



Sponsor

M/s. Voyants Solutions Private Limited.
403, 4th Floor, Park Centre, Sector-30,
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CONDUCTED BY

VISON LABS
ENVIRONMENTAL CONSULTANTS & ANALYTICAL SERVICES

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R E P O R T

Season: Post-Monsoon Season-2019

FOR

Palamuru Rangareddy Lift Irrigation Scheme (PRLIS)
Canal Network – Phase II (Irrigation)
Mhabubnagar District, Telangana State

Sponsor

Voyants Solutions Private Limited.
403, 4th Floor, Park Centre, Sector-30,
Opp. 32nd Milestone, NH-8, Gurgaon-122001,
Haryana.

For and behalf of Vison Labs

Approved By : T Laxmikanth Reddy

Signed :

Position : Chief Executive

This report has been prepared by Vison Labs with all reasonable skill, care and diligence within the terms of the contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known, any such party relies on the report at their own risk.

SCOPE OF WORK

Monitoring of Ambient Air Quality, Water quality, Soil quality and Ambient Noise Quality measurement are part of the scope of work given to M/s Vison Labs. The environmental Monitoring has been carried out at the following locations:

A] Ambient Air Quality Locations:

Location Code	Location Name	Co-Ordinates
AAQ-1	Boin Palli Village	16°44'28.05"N, 78°20'46.55"E
AAQ-2	Munimokesham Village	16°50'46.30"N, 77°51'5.10"E
AAQ-3	Madhanapuram Village	16°55'38.81"N, 78°44'13.16"E
AAQ-4	Bandanadi Gudur Village	17° 5'53.30"N, 78°30'18.60"E
AAQ-5	Medipalle Kalan Village	17°13'53.28"N , 78° 0'41.00"E
AAQ-6	Yenkepalle Village	17° 9'6.10"N, 77°38'0.80"E

B] Ambient Noise Quality Locations:

Location Code	Noise Level Locations Name	Date Of Monitoring	Co-Ordinates
N-1	Boin Palli Village	16.11.2019	16°44'22.89"N, 78°20'51.91"E
N-2	Munimokesham Village	18.11.2019	16°50'46.10"N, 77°51'5.70"E
N-3	Madhanapuram Village	12.11.2019	16°55'39.15"N, 78°44'11.58"E
N-4	Bandanadi Gudur Village	14.11.2019	17° 5'51.93"N, 78°30'22.08"E
N-5	Medipalle Kalan Village	20.11.2019	17°13'53.17"N, 78° 0'41.10"E
N-6	Yenkepalle Village	23.11.2019	17° 9'9.30"N, 77°38'2.65"E

C] Ground Water Quality Location:

Location Code	Ground Water Location Names	Date of Sampling	Co-Ordinates
GW-1	Boin Palli Village	17.11.2019	16°44'32.94"N, 78°20'53.19"E
GW-2	Munimokesham Village	18.11.2019	16°50'47.40"N, 77°51'4.60"E
GW-3	Madhanapuram Village	17.11.2019	16°55'41.37"N, 78°44'11.74"E
GW-4	Bandanadi Gudur Village	17.11.2019	17°5'54.17"N, 78°30'19.87"E
GW-5	Medipalle Kalan Village	18.11.2019	17°13'55.34"N, 78° 0'45.35"E
GW-6	Yenkepalle Village	18.11.2019	17°9'8.30"N, 77°38'2.17"E

D] Surface Water Quality Location:

Location Code	Surface Water Location Names	Date of Sampling	Co-Ordinates
SW1	BoinPalli Village	17.11.2019	16°44'18.06"N, 78°20'56.08"E
SW2	Munimokesham Village	17.11.2019	16°50'43.78"N, 77°51'11.54"E
SW3	Madhanapuram Village	17.11.2019	16°55'40.95"N, 78°44'5.86"E
SW4	BandanadiGudur Village	18.11.2019	17° 6'20.63"N, 78°30'21.48"E
SW5	Medipalle Kalan Village	18.11.2019	17°14'26.75"N, 78° 2'58.44"E
SW6	Yenkepalle Village	18.11.2019	17° 9'8.65"N, 77°38'8.41"E
SW7	500 m Upstream of Water sourcing area	18.11.2019	16° 6'27.61"N, 78°24'29.72"E
SW8	500 m downstream of Water sourcing area	18.11.2019	16° 5'39.45"N, 78°23'57.99"E

E] Soil Quality Location

Location Code	Soil Location Name	Sample Collection Dates	Co-Ordinates
S-1	Boin Palli Village	17.11.2019	16°44'27.64"N, 78°20'41.87"E
S-2	Munimokesham Village	18.11.2019	16°50'42.88"N, 77°51'9.17"E
S-3	Madhanapuram Village	17.11.2019	16°55'43.62"N, 78°44'4.32"E
S-4	Bandanadi Gudur Village	17.11.2019	17° 5'53.58"N, 78°30'16.21"E
S-5	Medipalle Kalan Village	18.11.2019	17°13'53.37"N, 78° 0'46.54"E
S-6	Yenkepalle Village	18.11.2019	17° 8'57.69"N, 77°37'56.65"E

MONITORING AND ANALYSIS METHODOLOGY

The consultant had Pre-identified the monitoring stations for Air, Water and Noise. Time bound program for carrying out fieldwork was prepared and was followed as far as possible. The IS methods are followed to decide the monitoring stations, analysis of different samples and also alternative methods are used, where the cross verification is required.

Ambient Air Quality Monitoring:

Respirable Dust Samplers (RDS) with gaseous attachment have been used for PM10/PM2.5 Sampling. RDS with Gaseous attachment assembly is used for the collection of gaseous pollutants such as SO_2, NO_2, NH_3, O_3, Bap, Benzene, As, Ni, Pb and CO.

Ambient Air monitoring instruments

Instrument	Make	Model No.	Range and Sensitivity	
			PM10/PM2.5	Gases
Respirable Dust Sampler (RDS)	M/s. ECO Tech	AAS-271	PM_{10} 2.3 m^3/hour $PM_{2.5}$ 1.0 m^3/hour ±0.02 m^3/hour	0 – 3 LPM ± 0.2 LPM

Testing Method to be followed for Ambient Air Quality

Particular		Testing Method to be Followed
Ambient Air Monitoring Parameter		
A	PM_{10}	IS-5182 (part – IV) 2006
B	$PM_{2.5}$	EPA - Quality Assurance Guidance Document 2.12
C	SO_2 (Sulfur Dioxide)	IS 5182 (Part – II) 2001, with Improved West & Gaeke Method
D	NO_2 (Nitrogen Dioxide)	Modified Jacobs – Hochheiser Method / Arsenite Method
E	CO (Carbon Monoxide)	Indicator Tube Method/CO Analyzer

Noise Level Measurement

Instant sound level meter is used for the collection of data related to noise at an interval of one hour per reading. Noise level for 24 hours was conducted location.

Noise (Sound) Measuring Instrument

Instrument	Make	Model No.	Detection Limit
Integrated Sound Level Measurement Instrument Standard Accessories	HTC	SL-1352	Lower level: 35-80dB(A) Higher level: 80-130dB(A)

Testing Method to be followed

Sr.No.	Particular		Testing Method to be Followed
	Noise Level Measurement		
1	A	Noise Level in dB (A) for continuous 24 hours at 1 hour interval	Comply With IEC61672-1 Class - 2 Standard

Water Quality Survey

Water samples were collected in Pre-sterilized sampling container. Chemical and Metals analysis was carried out as per standard Methods for water Analysis, Published by BIS, AWWA, APHA, etc.

Soil Quality Survey

Soil samples were collected in sealed sampling Polyethylene covers. Chemical and Metals analysis was carried out as per standard Methods for Soil Analysis, Published by BIS etc.

Quality Assurance

VISON LABS is accredited by Ministry Of Environment & forests, GOVT. OF INDIA and follows quality systems as per ISO 9001:2015. The QA/QC procedures are laid prior to sample collection and laboratory analysis. It includes the standard procedures of sample collection, preservation, transportation and laboratory analysis with all documented procedures and continuous monitoring of Quality Control Division.

Results of Survey Data

The Survey results of Ambient Air Quality, Ambient Noise Monitoring and Water Sampling analysis are presented below

Ambient Air Quality Monitoring

The Ambient Air Quality has been monitored at Six locations. The table showing Ambient Air Quality is present in **Table -1 to Table 6** respectively.

TABLE-1

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Boin Palli Village (AAQ1)

S.No	Date of Sampling	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
November - 2019						
1st Week	04.11.2019	39.9	21.1	6.6	14.4	<1.0
	05.11.2019	42.7	23.9	7.4	16.2	<1.0
2nd Week	11.11.2019	45.6	23.7	6.7	16.1	<1.0
	12.11.2019	43.2	21.2	6.1	14.4	<1.0
3rd Week	18.11.2019	41.9	21.4	6.4	14.5	<1.0
	19.11.2019	38.9	21.4	7.0	14.5	<1.0
4th Week	25.11.2019	45.6	26.9	6.7	18.3	<1.0
	26.11.2019	42.3	22.0	6.8	15.0	<1.0
Arithmetic Mean		**42.5**	**22.7**	**6.7**	**14.2**	**<1.0**
Maximum		**45.6**	**26.9**	**7.4**	**18.3**	**<1.0**
Minimum		**38.9**	**21.1**	**6.1**	**14.4**	**<1.0**
Percentile Values						
50th percentile		**42.5**	**21.7**	**6.7**	**14.8**	**<1.0**
98th percentile		**45.6**	**26.5**	**7.3**	**18.0**	**<1.0**

TABLE-2

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Munimokesham Village (AAQ-2)

S.No	Date of Sampling	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
November - 2019						
1st Week	06.11.2019	34.2	18.1	5.4	12.4	<1.0
	07.11.2019	32.6	18.3	5.4	12.5	<1.0
2nd Week	13.11.2019	33.5	17.4	4.7	11.9	<1.0
	14.11.2019	31.6	15.5	4.2	10.3	<1.0
3rd Week	20.11.2019	32.6	16.6	4.8	11.4	<1.0
	21.11.2019	32.8	18.1	5.7	12.4	<1.0
4th Week	27.11.2019	35.6	21.2	5.0	15.0	<1.0
	28.11.2019	34.6	18.4	5.3	12.3	<1.0
Arithmetic Mean		**33.4**	**18.0**	**5.1**	**12.3**	**<1.0**
Maximum		**35.6**	**21.2**	**5.7**	**15.0**	**<1.0**
Minimum		**31.6**	**15.5**	**4.2**	**10.3**	**<1.0**
Percentile Values						
50th percentile		**33.2**	**18.1**	**5.2**	**12.4**	**<1.0**
98th percentile		**35.5**	**20.8**	**5.7**	**14.7**	**<1.0**

TABLE-3

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Madhanapuram Village (AAQ-3)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
November - 2017						
1st Week	06.11.2019	29.9	15.9	5.6	10.9	<1.0
	07.11.2019	31.0	17.4	6.1	11.9	<1.0
2nd Week	13.11.2019	30.5	16.2	5.2	10.9	<1.0
	14.11.2019	31.6	16.4	5.3	10.5	<1.0
3rd Week	20.11.2019	32.6	16.6	5.7	11.4	<1.0
	21.11.2019	28.4	16.3	6.1	11.3	<1.0
4th Week	27.11.2019	30.5	18.4	5.5	12.3	<1.0
	28.11.2019	31.5	16.3	5.7	11.2	<1.0
Arithmetic Mean		**30.8**	**16.7**	**5.7**	**11.3**	**<1.0**
Maximum		**32.6**	**18.4**	**6.1**	**12.3**	**<1.0**
Minimum		**28.4**	**15.9**	**5.2**	**10.5**	**<1.0**
Percentile Values						
50th percentile		**30.8**	**16.4**	**5.7**	**11.3**	**<1.0**
98th percentile		**32.5**	**18.3**	**6.1**	**12.2**	**<1.0**

TABLE-4

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Bandanadi Gudur Village (AAQ-4)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
November - 2019						
1st Week	04.11.2019	26.3	13.9	5.0	9.6	<1.0
	05.11.2019	24.5	13.7	4.9	9.3	<1.0
2nd Week	11.11.2019	28.6	14.9	4.9	10.1	<1.0
	12.11.2019	23.5	11.5	<4.0	7.9	<1.0
3rd Week	18.11.2019	21.6	11.0	4.2	7.5	<1.0
	19.11.2019	25.3	13.9	5.2	9.6	<1.0
4th Week	25.11.2019	24.8	14.6	4.2	10.0	<1.0
	26.11.2019	26.3	13.7	4.8	9.3	<1.0
Arithmetic Mean		**25.1**	**13.4**	**4.6**	**9.2**	**<1.0**
Maximum		**28.6**	**14.9**	**5.2**	**10.1**	**<1.0**
Minimum		**21.6**	**11.0**	**<4.0**	**7.5**	**<1.0**
Percentile Values						
50th percentile		**25.1**	**13.8**	**4.9**	**9.5**	**<1.0**
98th percentile		**28.3**	**14.9**	**5.1**	**10.0**	**<1.0**

TABLE-5

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Medipalle Kalan Village (AAQ-5)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
November - 2019						
1st Week	06.11.2019	27.0	14.4	5.1	9.8	<1.0
	07.11.2019	28.1	13.0	4.6	9.0	<1.0
2nd Week	13.11.2019	28.1	14.6	4.8	10.5	<1.0
	14.11.2019	25.3	16.2	4.3	8.5	<1.0
3rd Week	20.11.2019	26.4	13.5	4.7	9.2	<1.0
	21.11.2019	25.9	14.3	5.7	9.8	<1.0
4th Week	27.11.2019	26.6	13.7	4.2	9.4	<1.0
	28.11.2019	23.9	12.4	4.2	8.4	<1.0
Arithmetic Mean		**26.4**	**14.0**	**4.7**	**9.3**	**<1.0**
Maximum		**28.1**	**16.2**	**5.7**	**10.5**	**<1.0**
Minimum		**23.9**	**12.4**	**4.2**	**8.4**	**<1.0**
Percentile Values						
50th percentile		**26.5**	**14.0**	**4.7**	**9.3**	**<1.0**
98th percentile		**28.1**	**16.0**	**5.6**	**10.4**	**<1.0**

TABLE-6

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Yenkepalle Village (AAQ-6)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
November - 2019						
1st Week	06.11.2019	30.2	16.0	4.8	11.0	<1.0
	07.11.2019	31.5	17.6	5.1	12.2	<1.0
2nd Week	13.11.2019	31.6	16.4	4.4	11.3	<1.0
	14.11.2019	28.6	14.0	<4.0	9.5	<1.0
3rd Week	20.11.2019	29.9	15.2	4.3	10.5	<1.0
	21.11.2019	31.6	17.4	5.5	11.9	<1.0
4th Week	27.11.2019	32.5	19.2	4.5	13.2	<1.0
	28.11.2019	34.6	18.0	5.3	12.3	<1.0
Arithmetic Mean		**31.3**	**16.7**	**4.8**	**11.5**	<1.0
Maximum		**34.6**	**19.2**	**5.5**	**13.2**	<1.0
Minimum		**28.6**	**14.0**	**<4.0**	**9.5**	<1.0
Percentile Values						
50th percentile		**31.6**	**16.9**	**4.8**	**11.6**	**<1.0**
98th percentile		**34.3**	**19.0**	**5.4**	**13.1**	**<1.0**

AMBIENT NOISE LEVELS IN THE STUDY AREA

The statistical analysis is done for measured noise levels at Six locations in the study area. The Noise Readings are analyzed for L_{day} and L_{night}, The statistical analysis results are given in **TABLE-7**

TABLE-7

Ambient Noise Quality Locations

Location Code	Noise Level Locations Name	Date Of Monitoring	Co-Ordinates
N-1	Boin Palli Village	16.11.2019	16°44'32.59"N, 78°20'51.27"E
N-2	Munimokesham Village	18.11.2019	16°50'49.96"N, 77°51'0.49"E
N-3	Madhanapuram Village	12.11.2019	16°55'42.94"N, 78°44'4.20"E
N-4	Bandanadi Gudur Village	14.11.2019	17° 5'52.18"N, 78°30'16.95"E
N-5	Medipalle Kalan Village	20.11.2019	17°13'52.63"N, 78° 0'49.94"E
N-6	Yenkepalle Village	23.11.2019	17° 8'57.69"N, 77°37'56.65"E

AMBIENT NOISE LEVELS IN THE STUDY AREA

All the values are expressed in dB (A)

Time	N-1	N-2	N-3	N-4	N-5	N-6
HOURS						
06:00 – 07:00	40.6	39	37.5	35.3	38.5	37.5
07:00 – 08:00	42.6	41.8	40.6	37.4	40.4	40.1
08:00 – 09:00	46.8	43.3	41	38.9	43.6	41.3
09:00 – 10:00	45.4	45	43.7	41.1	45.8	45.1
10:00 – 11:00	41.2	44.2	42.5	42.8	42.4	45.2
11:00 – 12:00	43.2	42.9	41.9	43.4	44.2	43.8
12:00 – 13:00	45.8	41.5	40.7	40.1	40.1	42.7
13:00 – 14:00	42.4	40.2	43.3	41.5	42.3	41.3
14:00 – 15:00	41.3	40.7	44.6	40.7	40.1	38.6
15:00 – 16:00	45.9	43.9	41	42.5	45.3	40.1
16:00 – 17:00	47	45.2	44.9	44.1	41.4	43.2
17:00 – 18:00	43.8	46	45.6	41.9	40.5	41.3
18:00 – 19:00	42.2	42.6	43.1	40.5	42.6	44.1
19:00 – 20:00	40.7	40.3	40.2	39.3	44.1	40.6
20:00 – 21:00	40.2	37.8	38.5	36.9	38.2	39.3
21:00 – 22:00	37.5	35.3	36	34.6	36.1	37.1
22:00 – 23:00	34.2	33.8	34.6	31.8	34.9	35.6
23:00 – 24:00	31.6	31.4	31.9	30.6	30.7	31.2
24:00 – 01:00	30.9	30.3	31	30.3	31.2	30.6
01:00 – 02:00	30.8	30.7	30.6	30.4	30.2	30.3
02:00 – 03:00	31	30.1	30.7	31.2	31.2	30.2
03:00 – 04:00	30.8	30.8	30.1	30.7	32	30.6
04:00 – 05:00	33.7	31.6	33.9	31.5	33.3	31.8
05:00 – 06:00	37.6	35.4	36.6	33.7	35.8	35.7
L Day	**43.6**	**42.6**	**42.2**	**40.8**	**42.3**	**41.7**
L Night	**33.3**	**32.2**	**33.0**	**31.4**	**32.9**	**32.6**

a) Day Time Noise Levels (L_{day})

The daytime (L_{day}) noise levels are observed to be in the range of 43.6 – 40.8 dB (A).

b) Night time Noise Levels (L_{night})

The nighttime (L_{night}) Noise levels were observed to be in the range of 33.3 – 31.4 dB (A).

Ground Water Quality

Six Ground water samples was collected and analyzed. The analytical results are given in **TABLE-8 to TABLE – 9**

TABLE-8

Location Code	Bore Well Location	Date of Sampling
GW1	BoinPalli Village	17.11.2019
GW2	Munimokesham Village	17.11.2019
GW3	Madhanapuram Village	17.11.2019

GROUND WATER QUALITY ANALYSIS RESULTS

S.No.	Parameter	Units	Requirement (Desirable Limits)	Permissible Limits in the Absence of Alternate Source	GW-1	GW-2	GW-3
1.	pH at 25 ^oC	-	6.5 – 8.5	NR	7.11	7.85	7.06
2.	Color	Hazen	5	15	<01	<01	<01
3.	Turbidity	NTU	Agreeable	Agreeable	1.42	1.56	1.38
4.	TSS	mg/l			5	6	5
5.	Total Dissolve solids	mg/l	Agreeable	Agreeable	1259	348	345
6.	Total Hardness as $CaCO_3$	mg/l	1	5	699	110	156
7.	Total Alkalinity	mg/l	500	2000	340	110	159
8.	Calcium as Ca	mg/l	200	600	155	26	37
9.	Magnesium as Mg	mg/l	200	600	75.1	11.0	15.5
10.	Chloride as Cl	mg/l	75	200	271.4	59.8	27.8
11.	Residual Free Chlorine	mg/l	30	100	<0.001	<0.001	<0.001
12.	Phenolic Compounds	mg/l	250	1000	<0.001	<0.001	<0.001
13.	Mineral Oil	mg/l	0.2	1.0	<0.01	<0.01	<0.01
14.	Sulphate as SO_4	mg/l	0.001	0.002	235.2	58.7	30.6
15.	Fluorides as F^-	mg/l	0.2	1.0	0.8	0.4	0.4
16.	Nitrates as NO_3	mg/l	0.5	No relaxation	11.6	4.7	4.6
17.	Iron as Fe	mg/l	200	400	0.18	0.14	0.13
18.	Zinc as Zn	mg/l	1.0	1.5	0.038	0.010	0.006
19.	Lead as Pb	mg/l	45	No relaxation	<0.001	<0.001	<0.001
20.	Arsenic as orc	mg/l	0.3	No relaxation	<0.001	<0.001	<0.001
21.	Mercury as Hg	mg/l	5	15	<0.0001	<0.0001	<0.0001
22.	Cadmium as Cd	mg/l	0.01	No relaxation	<0.001	<0.001	<0.001
23.	Total Chromium	mg/l	0.01	0.05	<0.0001	<0.0001	<0.0001
24.	Copper as Cu	mg/l	0.001	No relaxation	0.016	<0.001	<0.001
25.	Manganese as Mn	mg/l	0.003	No relaxation	<0.001	<0.001	<0.001
26.	Selenium as Se	mg/l	0.05	No relaxation	<0.001	<0.001	<0.001
27.	Cyanide as CN	mg/l	0.05	1.5	<0.001	<0.001	<0.001
28.	Aluminium as Al	mg/l	0.1	0.3	<0.001	<0.001	<0.001
29.	Boron as B	mg/l	0.01	No relaxation	0.003	<0.001	<0.001
30.	Pesticide Residue	µg/L	0.05	No relaxation	<0.1	<0.1	<0.1
31.	Coli form	MPN/2 50ml	0.03	0.2	Not detected	Not detected	Not detected
32.	E. Coli	MPN/2 50ml	0.5	1.0	Not detected	Not detected	Not detected

Results & Conclusions

The sampling and analysis was done as per standard methods prescribed 3025 and APHA 23nd ed-2017.

TABLE-9
Ground Water Quality

Location Code	Bore Well Location	Date of Sampling
GW4	BandanadiGudur Village	18.11.2019
GW5	Medipalle Kalan Village	18.11.2019
GW6	Yenkepalle Village	18.11.2019

GROUND WATER QUALITY ANALYSIS RESULTS

S.No.	Parameter	Units	Requirement (Desirable Limits)	Permissible Limits in the Absence of Alternate Source	GW-4	GW-5	GW-6
1	pH at 25 ^oC	-	6.5 – 8.5	NR	7.21	7.69	7.28
2	Color	Hazen	5	15	<01	<01	<01
3	Turbidity	-	Agreeable	Agreeable	1.39	1.28	1.41
4	TSS	mg/l			5	4	5
5	Total Dissolve solids	-	Agreeable	Agreeable	656	617	654
6	Total Hardness as $CaCO_3$	NTU	1	5	382	375	374
7	Total Alkalinity	mg/L	500	2000	261	368	334
8	Calcium as Ca	mg/L	200	600	106	84	77
9	Magnesium as Mg	mg/L	200	600	26.7	44.3	42.4
10	Chloride as Cl	mg/L	75	200	65.3	23.0	69.9
11	Residual Free Chlorine	mg/L	30	100	<0.02	<0.02	<0.02
12	Phenolic Compounds	mg/L	250	1000	<0.001	<0.001	<0.001
13	Mineral Oil	mg/L	0.2	1.0	<0.01	<0.01	<0.01
14	Sulphate as SO_4	mg/L	0.001	0.002	76.7	30.3	25.0
15	Fluorides as F^-	mg/L	0.2	1.0	0.5	0.6	0.6
16	Nitrates as NO_3	mg/L	0.5	No relaxation	8.2	7.2	8.6
17	Iron as Fe	mg/L	200	400	0.08	0.12	0.13
18	Zinc as Zn	mg/L	1.0	1.5	0.018	<0.001	<0.001
19	Lead as Pb	mg/L	45	No relaxation	<0.001	<0.001	<0.001
20	Arsenic as orc	mg/L	0.3	No relaxation	<0.001	<0.001	<0.001
21	Mercury as Hg	mg/L	5	15	<0.0001	<0.0001	<0.0001
22	Cadmium as Cd	mg/L	0.01	No relaxation	<0.001	<0.001	<0.001
23	Total Chromium	mg/L	0.01	0.05	<0.0001	<0.0001	<0.0001
24	Copper as Cu	mg/L	0.001	No relaxation	<0.001	<0.001	<0.001
25	Manganese as Mn	mg/L	0.003	No relaxation	<0.001	<0.001	<0.001
26	Selenium as Se	mg/L	0.05	No relaxation	<0.001	<0.001	<0.001
27	Cyanide as CN	mg/L	0.05	1.5	<0.001	<0.001	<0.001
28	Aluminium as Al	mg/L	0.1	0.3	<0.001	<0.001	<0.001
29	Boron as B	mg/L	0.01	No relaxation	0.008	0.004	0.018
30	Pesticide Residue	mg/L	0.05	No relaxation	<0.1	<0.1	<0.1
31	Coli form	mg/L	0.03	0.2	Not detected	Not detected	Not detected
32	E. Coli	mg/L	0.5	1.0	Not detected	Not detected	Not detected

Results & Conclusions

The sampling and analysis was done as per standard methods prescribed 3025 and APHA 23nd ed-2017.

Surface Water Quality

Six Surface water samples was collected and analyzed. The analytical results are given in **TABLE-10**

TABLE-10

Location Code	Location Name	Sample Collection Dates
SW-1	Surface Water Collected at Boinpalli Village	17.11.2019
SW-2	Surface Water Collected Munimokesham Village	17.11.2019
SW-3	Surface Water Collected Madhanapuram Village	17.11.2019
SW-4	Surface Water Collected BandanadiGudur Village	18.11.2019
SW-5	Surface Water Collected Medipalle Kalan Village	18.11.2019
SW-6	Surface Water Collected at Yenkepalle Village	18.11.2019
SW7	500 m Upstream of Water sourcing area	18.11.2019
SW8	500 m downstream of Water sourcing area	18.11.2019

TEST RESULTES

S.No	Parameter	Units	IS:2296 Class C Limits	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8
1	pH at 25 °C	-	6.5 – 8.5	7.82	7.95	8.07	7.62	8.12	7.73	8.17	8.12
2	Color	Hazen	300	10	20	20	10	30	20	60	60
3	Turbidity (NTU)	NTU	--	8.91	10.2	6.8	7.63	5.86	4.30	18.2	12.6
4	EC	µS/cm		260	308	315	381	270	233	255	280
5	Total Dissolve solids	mg/L	--	169	196	211	248	176	156	163	182
6	Total Hardness as $CaCO_3$	mg/L	--	92	113	118	130	90	104	60	70
7	Total Alkalinity	mg/L	1500	74	81	113	120	80	83	60	68
8	Calcium as Ca	mg/L	--	21.2	23.8	28.4	31.6	20.0	24.6	14.0	16.0
9	Magnesium as Mg	mg/L	--	8.8	12.1	12.6	12.3	9.8	9.6	6.1	7.0
10	Sodium as Na	mg/L		15.3	17.6	21.3	23.1	16.2	18.5	10.3	11.5
11	Chloride as Cl	mg/L	--	27.6	40.8	39.8	45.2	25.4	25.0	25	25
12	Residual Free Chlorine	mg/L	--	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
13	Phenolic Compounds	mg/L	600	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
14	Mineral Oil	mg/L	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15	Sulphate as SO_4	mg/L	0.005	20.1	26.2	37.0	25.3	33.7	18.5	26	22
16	Fluorides as F^-	mg/L	01	0.2	0.21	0.17	0.29	0.12	0.16	0.28	0.28
17	Nitrates as NO_3	mg/L	--	2.9	3.2	3.7	4.2	3.4	3.5	3.4	3.4
18	Iron as Fe	mg/L	400	0.08	0.06	0.08	0.07	0.06	0.04	0.08	0.08
19	Zinc as Zn	mg/L	1.5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20	Lead as Pb	mg/L	50	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21	Arsenic as orc	mg/L	50	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Mercury as Hg	mg/L	15	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
23	Cadmium as Cd	mg/L	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24	Total Chromium	mg/L	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
25	Copper as Cu	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26	Manganese as Mn	mg/L	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27	Selenium as Se	mg/L	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Cyanide as CN	mg/L	1.5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
29	Aluminium as Al	mg/L	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
30	Boron as B	mg/L	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
31	Pesticide Residue	µg/l	0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
32	Coliform	MPN/250ml	--	1400	1800	900	1200	1500	1400	690	789
33	E. Coli	MPN/250ml	--	Not Detecte	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

				d							
34	SAR			0.71	0.73	0.84	0.89	0.74	0.81	0.58	0.61
35	Dissolved Oxygen	mg/l	4.0	3.2	3.0	3.0	2.7	2.8	2.5	12.1	11.2
36	Chemical Oxygen Demand	mg/l	--	30	40	30	20	20	20	16	14
37	Biochemical oxygen Demand	mg/l	3.0	07	07	06	06	07	04	<3.0	<3.0

Results & Conclusions The sampling and analysis was done as per standard methods prescribed IS: 3025 and APHA 23nd ed-2017.

Soil Quality Analysis

Six Soil samples was collected and analyzed. The analytical results are given in below **Table-11 to Table-12**

Table-11
Soil Quality Location:

Location Code	Soil Sampling Location	Sampling dates
S-1	BoinPalli Village	17.11.2019
S-2	Munimokesham Village	18.11.2019
S-3	Madhanapuram Village	17.11.2019
S-4	BandanadiGudur Village	17.11.2019
S-5	Medipalle Kalan Village	18.11.2019
S-6	Yenkepalle Village	18.11.2019

SOIL TEST RESULTS

S.No	Parameter	Units	S-1	S-2	S-3	S-4	S-5	S-6
1	Texture	-	Clay Loam	Loam	Loam	Clay Loam	Clay Loam	Clay Loam
2	Sand	%	43.6	38.0	40.4	39.6	33.2	32.0
3	Silt	%	26.1	38.6	34.8	33.0	32.4	32.2
4	Clay	%	30.3	23.4	24.8	27.4	34.4	35.8
5	pH (10% Slurry)	-	7.20	7.61	7.34	7.40	7.45	7.28
6	El. Conductivity	µs/cm	218	268	231	248	263	274
7	Organic Matter	%	0.86	1.01	0.88	0.94	1.12	1.10
8	Bulk density	gm/cc	1.45	1.68	1.65	1.40	0.97	0.88
9	Porosity	% v/v	46.4	38.3	37.6	45.9	63.2	66.7
10	S.A. R	-	0.27	0.29	0.34	0.23	0.36	0.26
11	Calcium as Ca	mg/kg	1770	1795	1686	1810	1912	1825
12	Magnesium as Mg	mg/kg	255	264	235	265	238	305
13	Sodium as Na	mg/kg	28	31	35	25	38	29
14	Potassium as K	mg/kg	140	136	120	117	150	164
15	Phosphorus as P	mg/kg	8.3	7.4	9.6	9.4	9.5	9.3
16	Chloride as Cl	mg/kg	71.2	42.6	71.9	67.1	45.8	78.7
17	Zinc as Zn	mg/kg	1.28	1.86	1.22	1.23	1.45	1.15
18	Copper as Cu.	mg/kg	1.35	1.48	1.28	1.6	1.8	2.0
19	Iron as Fe	mg/kg	12.30	14.65	12.5	11.2	16.4	10.5
20	Nitrogen as N	mg/kg	103.6	92.7	80.9	101.1	120.1	151.5
21	Organic Carbon	%	0.51	0.57	0.49	0.57	0.64	0.61
22	Sulphate as SO4	mg/kg	86.9	104.25	82.05	82.25	74.8	80.3
23	Sulphur as S	mg/kg	18.3	15.65	22.31	18.15	16.26	16.67

24	Fluoride as F	mg/kg	2.63	3.44	2.9	3.1	2.6	3.5
25	Selenium as Se	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26	Manganese as Mn	mg/kg	7.75	10.7	9.5	9.41	12.25	14.25
27	Chromium as Cr	mg/kg	6.7	5.4	6.3	6.8	4.6	5.4
28	Nickel as Ni	mg/kg	10.05	11.85	13.3	11.1	9.35	10.37
29	CEC	meq/100g	8.3	4.7	6.9	6.7	6.4	8.3

Note: 1. The sampling and analysis was done as per standard methods prescribed in BIS.

SOME PHOTO GRAPHS AT THE TIME OF SAMPLING

MOEF&CC CERTIFICATE

Prepared by

Recognised by MoEF&CC, ISO 9001:2015, OHSAS 18001:2007
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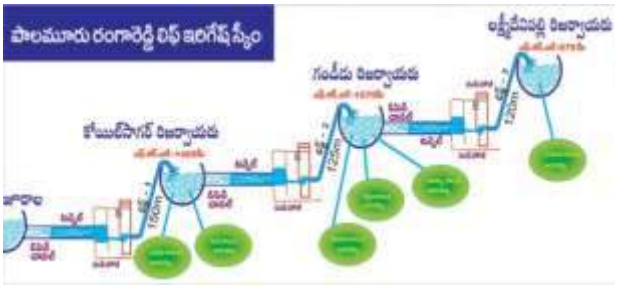
ENVIRONMENTAL DATA GENERATION REPORT

Season - Pre Monsoon - 2020

Client

Palamuru Rangareddy Lift Irrigation Scheme (PRLIS)
Canal Network – Phase II (Irrigation)
Mahbubnagar District, Telangana State



Sponsor

M/s. Voyants Solutions Private Limited.
403, 4th Floor, Park Centre, Sector-30,
Opp. 32nd Milestone, NH-8, Gurgaon-122001, Haryana.

CONDUCTED BY

VISON LABS
ENVIRONMENTAL CONSULTANTS & ANALYTICAL SERVICES

Recognised by MoEF&CC, ISO 9001:2015, OHSAS 18001:2007
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R E P O R T

Season - Pre Monsoon - 2020

FOR

Palamuru Rangareddy Lift Irrigation Scheme (PRLIS)
Canal Network – Phase II (Irrigation)
Mahbubnagar District, Telangana State

Sponsor

Voyants Solutions Private Limited.
403, 4th Floor, Park Centre, Sector-30,
Opp. 32nd Milestone, NH-8, Gurgaon-122001,
Haryana.

For and behalf of Vison Labs

Approved By : T Laxmikanth Reddy

Signed :

Position : Chief Executive

This report has been prepared by Vison Labs with all reasonable skill, care and diligence within the terms of the contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known, any such party relies on the report at their own risk.

SCOPE OF WORK

Monitoring of Ambient Air Quality, Water quality, Soil quality and Ambient Noise Quality measurement are part of the scope of work given to M/s Vison Labs. The environmental Monitoring has been carried out at the following locations:

A] Ambient Air Quality Locations:

Location Code	Location Name	Co-Ordinates
AAQ-1	Boin Palli Village	16°44'28.05"N, 78°20'46.55"E
AAQ-2	Munimokesham Village	16°50'46.30"N, 77°51'5.10"E
AAQ-3	Madhanapuram Village	16°55'38.81"N, 78°44'13.16"E
AAQ-4	Bandanadi Gudur Village	17° 5'53.30"N, 78°30'18.60"E
AAQ-5	Medipalle Kalan Village	17°13'53.28"N , 78° 0'41.00"E
AAQ-6	Yenkepalle Village	17° 9'6.10"N, 77°38'0.80"E

B] Ambient Noise Quality Locations:

Location Code	Noise Level Locations Name	Date Of Monitoring	Co-Ordinates
N-1	Boin Palli Village	05.03.2020	16°44'22.89"N, 78°20'51.91"E
N-2	Munimokesham Village	08.03.2020	16°50'46.10"N, 77°51'5.70"E
N-3	Madhanapuram Village	07.03.2020	16°55'39.15"N, 78°44'11.58"E
N-4	Bandanadi Gudur Village	09.03.2020	17° 5'51.93"N, 78°30'22.08"E
N-5	Medipalle Kalan Village	11.03.2020	17°13'53.17"N, 78° 0'41.10"E
N-6	Yenkepalle Village	14.03.2020	17° 9'9.30"N, 77°38'2.65"E

C] Ground Water Quality Location:

Location Code	Ground Water Location Names	Date of Sampling	Co-Ordinates
GW-1	BoinPalli Village	10.03.2020	16°44'32.94"N, 78°20'53.19"E
GW-2	Munimokesham Village	11.03.2020	16°50'47.40"N, 77°51'4.60"E
GW-3	Madhanapuram Village	12.03.2020	16°55'41.37"N, 78°44'11.74"E
GW-4	BandanadiGudur Village	13.03.2020	17°5'54.17"N, 78°30'19.87"E
GW-5	Medipalle Kalan Village	15.03.2020	17°13'55.34"N, 78° 0'45.35"E
GW-6	Yenkepalle Village	17.03.2020	17°9'8.30"N, 77°38'2.17"E

D] Surface Water Quality Location:

Location Code	Surface Water Location Names	Date of Sampling	Co-Ordinates
SW-1	BoinPalli Village	10.03.2020	16°44'18.06"N, 78°20'56.08"E
SW-2	Munimokesham Village	11.03.2020	16°50'43.78"N, 77°51'11.54"E
SW-3	Madhanapuram Village	12.03.2020	16°55'40.95"N, 78°44'5.86"E
SW-4	BandanadiGudur Village	13.03.2020	17° 6'20.63"N, 78°30'21.48"E
SW-5	Medipalle Kalan Village	15.03.2020	17°14'26.75"N, 78° 2'58.44"E
SW-6	Yenkepalle Village	17.03.2020	17° 9'8.65"N, 77°38'8.41"E
SW-7	500 m Upstream of Water sourcing area	10.03.2020	16° 6'27.61"N, 78°24'29.72"E
SW-8	500 m downstream of Water sourcing area	10.03.2020	16° 5'39.45"N, 78°23'57.99"E

E] Soil Quality Location

Location Code	Soil Location Name	Sample Collection Dates	Co-Ordinates
S-1	BoinPalli Village	10.03.2020	16°44'27.64"N, 78°20'41.87"E
S-2	Munimokesham Village	11.03.2020	16°50'42.88"N, 77°51'9.17"E
S-3	Madhanapuram Village	12.03.2020	16°55'43.62"N, 78°44'4.32"E
S-4	Bandanadi Gudur Village	13.03.2020	17° 5'53.58"N, 78°30'16.21"E
S-5	Medipalle Kalan Village	15.03.2020	17°13'53.37"N, 78° 0'46.54"E
S-6	Yenkepalle Village	17.03.2020	17° 8'57.69"N, 77°37'56.65"E

MONITORING AND ANALYSIS METHODOLOGY

Environmental Data Generation Report for Palamuru Rangareddy Lift Irrigation Scheme (PRLIS).

The consultant had Pre-identified the monitoring stations for Air, Water and Noise. Time bound program for carrying out fieldwork was prepared and was followed as far as possible. The IS methods are followed to decide the monitoring stations, analysis of different samples and also alternative methods are used, where the cross verification is required.

Ambient Air Quality Monitoring:

Respirable Dust Samplers (RDS) with gaseous attachment have been used for PM10/PM2.5 Sampling. RDS with Gaseous attachment assembly is used for the collection of gaseous pollutants such as SO_2, NO_2, NH_3, O_3, Bap, Benzene, As, Ni, Pb and CO.

Ambient Air monitoring instruments

Instrument	Make	Model No.	Range and Sensitivity	
			PM10/PM2.5	Gases
Respirable Dust Sampler (RDS)	M/s. ECO Tech	AAS-271	PM_{10} 2.3 m^3/hour $PM_{2.5}$ 1.0 m^3/hour ±0.02 m^3/hour	0 – 3 LPM ± 0.2 LPM

Testing Method to be followed for Ambient Air Quality

Particular		Testing Method to be Followed
Ambient Air Monitoring Parameter		
A	PM_{10}	IS-5182 (part – IV) 2006
B	$PM_{2.5}$	EPA - Quality Assurance Guidance Document 2.12
C	SO_2 (Sulfur Dioxide)	IS 5182 (Part – II) 2001, with Improved West & Gaeke Method
D	NO_2 (Nitrogen Dioxide)	Modified Jacobs – Hochheiser Method / Arsenite Method
E	CO (Carbon Monoxide)	Indicator Tube Method/CO Analyzer

Noise Level Measurement

Instant sound level meter is used for the collection of data related to noise at an interval of one hour per reading. Noise level for 24 hours was conducted location.

Noise (Sound) Measuring Instrument

Instrument	Make	Model No.	Detection Limit
Integrated Sound Level Measurement Instrument Standard Accessories	HTC	SL-1352	Lower level: 35-80dB(A) Higher level: 80-130dB(A)

Testing Method to be followed

Sr.No.	Particular		Testing Method to be Followed
	Noise Level Measurement		
1	A	Noise Level in dB (A) for continuous 24 hours at 1 hour interval	Comply With IEC61672-1 Class - 2 Standard

Water Quality Survey

Water samples were collected in Pre-sterilized sampling container. Chemical and Metals analysis was carried out as per standard Methods for water Analysis, Published by BIS, AWWA, APHA, etc.

Soil Quality Survey

Soil samples were collected in sealed sampling Polyethylene covers. Chemical and Metals analysis was carried out as per standard Methods for Soil Analysis, Published by BIS etc.

Quality Assurance

VISON LABS is accredited by Ministry Of Environment & forests, GOVT. OF INDIA and follows quality systems as per ISO 9001:2015. The QA/QC procedures are laid prior to sample collection and laboratory analysis. It includes the standard procedures of sample collection, preservation, transportation and laboratory analysis with all documented procedures and continuous monitoring of Quality Control Division.

Results of Survey Data

The Survey results of Ambient Air Quality, Ambient Noise Monitoring and Water Sampling analysis are presented below

Environmental Data Generation Report for Palamuru Rangareddy Lift Irrigation Scheme (PRLIS).

Ambient Air Quality Monitoring

The Ambient Air Quality has been monitored at Six locations. The table showing Ambient Air Quality is present in **Table -1 to Table 6** respectively.

TABLE-1

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Boin Palli Village (AAQ1)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
March - 2020						
1st Week	02.03.2020	41.3	21.9	6.3	15.0	<1.0
	03.03.2020	44.7	25.8	6.8	17.5	<1.0
2nd Week	09.03.2020	42.5	21.3	6.5	14.6	<1.0
	10.03.2020	49.3	21.3	6.0	14.2	<1.0
3rd Week	16.03.2020	44.0	22.4	6.7	15.4	<1.0
	17.03.2020	45.1	24.8	6.4	17.1	<1.0
Arithmetic Mean		**44.5**	**22.8**	**6.5**	**15.6**	**<1.0**
Maximum		**49.3**	**25.8**	**6.8**	**17.5**	**<1.0**
Minimum		**41.3**	**21.3**	**6**	**14.2**	**<1.0**
Percentile Values						
50th percentile		**44.4**	**22.2**	**6.5**	**15.2**	**<1.0**
98th percentile		**48.9**	**25.7**	**6.8**	**17.5**	**<1.0**

TABLE-2

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Munimokesham Village (AAQ-2)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
March - 2020						
1st Week	04.03.2020	31.3	16.6	4.7	11.4	<1.0
	05.03.2020	34.0	19.1	5.2	10.8	<1.0
2nd Week	11.03.2020	37.4	15.9	5.6	14.2	<1.0
	12.03.2020	38.4	18.8	5.2	13.0	<1.0
3rd Week	18.03.2020	37.2	21.6	5.5	14.6	<1.0
	19.03.2020	39.0	19.9	5.7	14.2	<1.0
Arithmetic Mean		**36.2**	**18.7**	**5.3**	**13.0**	**<1.0**
Maximum		**39**	**21.6**	**5.7**	**14.6**	**<1.0**
Minimum		**31.3**	**15.9**	**4.7**	**10.8**	**<1.0**
Percentile Values						
50th percentile		**37.3**	**19.0**	**5.4**	**13.6**	**<1.0**

98th percentile	**38.9**	**21.4**	**5.7**	**14.6**	**<1.0**

TABLE-3

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Madhanapuram Village (AAQ-3)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
March - 2020						
1st Week	02.03.2020	29.9	15.8	5.6	12.6	<1.0
	03.03.2020	30.6	17.1	5.5	13.1	<1.0
2nd Week	09.03.2020	34.5	19.4	6.0	11.6	<1.0
	10.03.2020	33.6	15.4	5.1	10.5	<1.0
3rd Week	16.03.2020	34.1	16.6	5.7	11.4	<1.0
	17.03.2020	33.5	18.4	6.3	12.9	<1.0
Arithmetic Mean		**32.7**	**17.1**	**5.7**	**12.0**	**<1.0**
Maximum		**34.5**	**19.4**	**6.3**	**13.1**	**<1.0**
Minimum		**29.9**	**15.4**	**5.1**	**10.5**	**<1.0**
Percentile Values						
50th percentile		**33.6**	**16.9**	**5.7**	**12.1**	**<1.0**
98th percentile		**34.5**	**19.3**	**6.3**	**13.1**	**<1.0**

TABLE-4

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Bandanadi Gudur Village (AAQ-4)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
March - 2020						
1st Week	02.03.2020	24.8	12.9	4.5	8.8	<1.0
	03.03.2020	29.8	16.5	4.9	12.6	<1.0
2nd Week	09.03.2020	31.5	18.2	5.6	13.6	<1.0
	10.03.2020	33.6	19.5	5.9	13.4	<1.0
3rd Week	16.03.2020	34.8	19.3	6.1	13.2	<1.0
	17.03.2020	35.0	18.6	5.8	12.0	<1.0
Arithmetic Mean		**31.6**	**17.5**	**5.5**	**12.3**	**<1.0**
Maximum		**35**	**19.5**	**6.1**	**13.6**	**<1.0**
Minimum		**24.8**	**12.9**	**4.5**	**8.8**	**<1.0**
Percentile Values						
50th percentile		**32.6**	**18.4**	**5.7**	**12.9**	**<1.0**

98th percentile	**35.0**	**19.5**	**6.1**	**13.6**	**<1.0**

TABLE-5

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Medipalle Kalan Village (AAQ-5)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
March - 2020						
1st Week	04.03.2020	27.4	16.9	5.2	9.5	<1.0
	05.03.2020	27.5	14.0	4.9	12.9	<1.0
2nd Week	11.03.2020	28.9	18.2	5.2	9.6	<1.0
	12.03.2020	33.6	19.9	5.6	13.7	<1.0
3rd Week	18.03.2020	34.2	20.4	6.2	12.3	<1.0
	19.03.2020	33.4	20.1	6.4	13.6	<1.0
Arithmetic Mean		**30.7**	**18.3**	**5.6**	**11.7**	**<1.0**
Maximum		**34.2**	**20.4**	**6.4**	**13.7**	**<1.0**
Minimum		**27.4**	**14**	**4.9**	**9.5**	**<1.0**
Percentile Values						
50th percentile		**31.2**	**19.1**	**5.4**	**12.6**	**<1.0**
98th percentile		**34.1**	**20.4**	**6.4**	**13.7**	**<1.0**

TABLE-6

RESULTS OF AMBIENT AIR QUALITY MONITORING

LOCATION OF SAMPLING SITE : Yenkepalle Village (AAQ-6)

S.No	Date of Sampling	PM $_{10}$ µg/m^3	PM $_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3
March - 2020						
1st Week	04.03.2020	29.9	15.8	4.3	10.7	<1.0
	05.03.2020	31.6	18.5	5.2	13.9	<1.0
2nd Week	11.03.2020	33.1	18.2	5.3	14.1	<1.0
	12.03.2020	32.6	17.6	4.9	13.8	<1.0
3rd Week	18.03.2020	34.1	18.6	4.9	13.7	<1.0
	19.03.2020	33.6	19.4	5.2	14.0	<1.0
Arithmetic Mean		**32.5**	**18.0**	**5.0**	**13.4**	**<1.0**
Maximum		**34.1**	**19.4**	**5.3**	**14.1**	**<1.0**
Minimum		**29.9**	**15.8**	**4.3**	**10.7**	**<1.0**
Percentile Values						
50th percentile		**32.9**	**18.4**	**5.1**	**13.9**	**<1.0**
98th percentile		**34.1**	**19.3**	**5.3**	**14.1**	**<1.0**

Environmental Data Generation Report for Palamuru Rangareddy Lift Irrigation Scheme (PRLIS).

AMBIENT NOISE LEVELS IN THE STUDY AREA

The statistical analysis is done for measured noise levels at Six locations in the study area. The Noise Readings are analyzed for L_{day} and L_{night}, The statistical analysis results are given in **TABLE-7**

TABLE-7

Ambient Noise Quality Locations

Location Code	Noise Level Locations Name	Date Of Monitoring	Co-Ordinates
N-1	Boin Palli Village	05.03.2020	16°44'32.59"N, 78°20'51.27"E
N-2	Munimokesham Village	08.03.2020	16°50'49.96"N, 77°51'0.49"E
N-3	Madhanapuram Village	07.03.2020	16°55'42.94"N, 78°44'4.20"E
N-4	Bandanadi Gudur Village	09.03.2020	17° 5'52.18"N, 78°30'16.95"E
N-5	Medipalle Kalan Village	11.03.2020	17°13'52.63"N, 78° 0'49.94"E
N-6	Yenkepalle Village	14.03.2020	17° 8'57.69"N, 77°37'56.65"E

AMBIENT NOISE LEVELS IN THE STUDY AREA

All the values are expressed in dB (A)

Time	N-1	N-2	N-3	N-4	N-5	N-6
HOURS						
06:00 – 07:00	46.1	45.9	42.5	40.1	44.3	43.5
07:00 – 08:00	51.8	49.2	46.1	42.5	46.6	46.5
08:00 – 09:00	54.3	51.1	47.9	44.2	48.8	47.9
09:00 – 10:00	51.5	53.0	49.7	46.7	50.6	52.3
10:00 – 11:00	49.7	51.3	49.0	48.7	48.9	52.4
11:00 – 12:00	50.1	50.7	47.6	49.4	48.5	50.8
12:00 – 13:00	51.9	46.9	46.2	45.3	46.3	49.5
13:00 – 14:00	48.0	46.0	49.0	44.6	48.8	47.9
14:00 – 15:00	49.7	48.1	50.7	46.4	46.0	44.8
15:00 – 16:00	52.0	51.7	47.8	48.4	50.9	46.5
16:00 – 17:00	53.2	53.2	51.0	50.2	47.8	50.1
17:00 – 18:00	49.6	54.2	51.9	47.6	46.0	47.9
18:00 – 19:00	47.8	50.2	48.9	46.1	47.6	51.1
19:00 – 20:00	46.2	47.5	45.7	44.6	48.8	47.1
20:00 – 21:00	45.5	44.6	43.7	41.9	44.0	45.6
21:00 – 22:00	42.5	41.7	40.8	39.3	41.6	43.0
22:00 – 23:00	40.8	39.9	39.4	36.2	40.2	41.3
23:00 – 24:00	38.3	36.9	36.2	34.8	35.4	36.2
24:00 – 01:00	35.0	34.9	35.3	32.9	33.9	34.1
01:00 – 02:00	34.9	34.1	32.6	31.5	33.2	32.6
02:00 – 03:00	33.5	33.8	32.8	31.3	31.7	33.1
03:00 – 04:00	34.2	34.5	34.2	31.5	32.0	33.0
04:00 – 05:00	41.2	37.3	38.4	31.5	38.4	36.9
05:00 – 06:00	42.6	41.8	41.7	38.4	41.3	41.4
L Day	**49.2**	**48.3**	**48.1**	**46.3**	**47.9**	**47.2**
L Night	**38.1**	**36.3**	**36.8**	**34.3**	**37.0**	**36.6**
L Day & L Night	**47.7**	**46.7**	**46.2**	**44.7**	**46.1**	**45.8**

Observations

a) Day Time Noise Levels (L_{day})

The daytime (L_{day}) noise levels are observed to be in the range of 49.2 – 46.3 dB (A).

b) Night time Noise Levels (L_{night})

The nighttime (L_{night}) Noise levels were observed to be in the range of 38.1 – 34.3 dB (A).

Ground Water Quality

Six Ground water samples was collected and analyzed. The analytical results are given in **TABLE-8 to TABLE – 9**

TABLE-8

Location Code	Bore Well Location	Date of Sampling
GW-1	BoinPalli Village	10.03.2020
GW-2	Munimokesham Village	11.03.2020
GW-3	Madhanapuram Village	12.03.2020

GROUND WATER QUALITY ANALYSIS RESULTS

S.No.	Parameter	Units	Requirement (Desirable Limits)	Permissible Limits in the Absence of Alternate Source	GW-1	GW-2	GW-3
1	pH at 25 ^oC	-	6.5 – 8.5	NR	7.13	7.82	7.16
2	Color	Hazen	5	15	<01	<01	<01
3	Turbidity (NTU)	NTU	Agreeable	Agreeable	1.12	1.33	1.24
4	TSS	mg/L			3	5	4
5	Total Dissolve solids	mg/L	Agreeable	Agreeable	1436	387	382
6	Total Hardness as $CaCO_3$	mg/L	1	5	798	126	181
7	Total Alkalinity	mg/L	500	2000	389	126	189
8	Calcium as Ca	mg/L	200	600	176	29	44
9	Magnesium as Mg	mg/L	200	600	85.7	12.6	19.1
10	Chloride as Cl	mg/L	75	200	309.8	68.7	31.5
11	Residual Free Chlorine	mg/L	30	100	<0.001	<0.001	<0.001
12	Phenolic Compounds	mg/L	250	1000	<0.001	<0.001	<0.001
13	Mineral Oil	mg/L	0.2	1.0	<0.01	<0.01	<0.01
14	Sulphate as SO_4	mg/L	0.001	0.002	268.5	67.2	35.0
15	Fluorides as F^-	mg/L	0.2	1.0	1.0	0.4	0.4
16	Nitrates as NO_3	mg/L	0.5	No relaxation	13.2	5.6	5.3
17	Iron as Fe	mg/L	200	400	0.2	0.1	0.1
18	Zinc as Zn	mg/L	1.0	1.5	0.042	0.014	0.011
19	Lead as Pb	mg/L	45	No relaxation	<0.001	<0.001	<0.001
20	Arsenic as orc	mg/L	0.3	No relaxation	<0.001	<0.001	<0.001
21	Mercury as Hg	mg/L	5	15	<0.0001	<0.0001	<0.0001
22	Cadmium as Cd	mg/L	0.01	No relaxation	<0.001	<0.001	<0.001
23	Total Chromium	mg/L	0.01	0.05	<0.0001	<0.0001	<0.0001
24	Copper as Cu	mg/L	0.001	No relaxation	0.019	<0.001	<0.001
25	Manganese as Mn	mg/L	0.003	No relaxation	<0.001	<0.001	<0.001
26	Selenium as Se	mg/L	0.05	No relaxation	<0.001	<0.001	<0.001
27	Cyanide as CN	mg/L	0.05	1.5	<0.001	<0.001	<0.001
28	Aluminium as Al	mg/L	0.1	0.3	<0.001	<0.001	<0.001
29	Boron as B	mg/L	0.01	No relaxation	0.003	<0.001	<0.001
30	Pesticide Residue	µg/L	0.05	No relaxation	<0.1	<0.1	<0.1
31	Coli form	MPN/2 50ml	0.03	0.2	Not detected	Not detected	Not detected
32	E. Coli	MPN/2 50ml	0.5	1.0	Not detected	Not detected	Not detected

Results & Conclusions

The sampling and analysis was done as per standard methods prescribed 3025 and APHA 23rd ed-2017.

TABLE-9

Ground Water Quality

Location Code	Bore Well Location	Date of Sampling
GW-4	BandanadiGudur Village	13.03.2020
GW-5	Medipalle Kalan Village	15.03.2020
GW-6	Yenkepalle Village	17.03.2020

GROUND WATER QUALITY ANALYSIS RESULTS

S.No.	Parameter	Units	Requirement (Desirable Limits)	Permissible Limits in the Absence of Alternate Source	GW-4	GW-5	GW-6
1	pH at 25 ^oC	-	6.5 – 8.5	NR	7.16	7.61	7.34
2	Color	Hazen	5	15	<01	<01	<01
3	Turbidity (NTU)	NTU	Agreeable	Agreeable	1.16	1.12	1.35
4	TSS	mg/L			4	4	5
5	Total Dissolve solids	mg/L	Agreeable	Agreeable	726	696	743
6	Total Hardness as $CaCO_3$	mg/L	1	5	424	440	426
7	Total Alkalinity	mg/L	500	2000	308	423	383
8	Calcium as Ca	mg/L	200	600	116	96	91
9	Magnesium as Mg	mg/L	200	600	32.8	58.2	49.1
10	Chloride as Cl	mg/L	75	200	71.4	26.3	76.7
11	Residual Free Chlorine	mg/L	30	100	<0.02	<0.02	<0.02
12	Phenolic Compounds	mg/L	250	1000	<0.001	<0.001	<0.001
13	Mineral Oil	mg/L	0.2	1.0	<0.01	<0.01	<0.01
14	Sulphate as SO_4	mg/L	0.001	0.002	88.1	35.2	28.6
15	Fluorides as F^-	mg/L	0.2	1.0	0.5	0.6	0.7
16	Nitrates as NO_3	mg/L	0.5	No relaxation	9.4	8.2	9.7
17	Iron as Fe	mg/L	200	400	0.2	0.1	0.1
18	Zinc as Zn	mg/L	1.0	1.5	0.020	<0.001	0.011
19	Lead as Pb	mg/L	45	No relaxation	<0.001	<0.001	<0.001
20	Arsenic as orc	mg/L	0.3	No relaxation	<0.001	<0.001	<0.001
21	Mercury as Hg	mg/L	5	15	<0.0001	<0.0001	<0.0001
22	Cadmium as Cd	mg/L	0.01	No relaxation	<0.001	<0.001	<0.001
23	Total Chromium	mg/L	0.01	0.05	<0.0001	<0.0001	<0.0001
24	Copper as Cu	mg/L	0.001	No relaxation	0.018	0.011	0.021
25	Manganese as Mn	mg/L	0.003	No relaxation	<0.001	<0.001	<0.001
26	Selenium as Se	mg/L	0.05	No relaxation	<0.001	<0.001	<0.001
27	Cyanide as CN	mg/L	0.05	1.5	<0.001	<0.001	<0.001
28	Aluminium as Al	mg/L	0.1	0.3	<0.001	<0.001	<0.001
29	Boron as B	mg/L	0.01	No relaxation	0.011	0.009	0.012
30	Pesticide Residue	µg/L	0.05	No relaxation	<0.1	<0.1	<0.1
31	Coliform	MPN/250ml	0.03	0.2	Not detected	Not detected	Not detected
32	E. Coli	MPN/250ml	0.5	1.0	Not detected	Not detected	Not detected

Results & Conclusions

The sampling and analysis was done as per standard methods prescribed 3025 and APHA 23rd ed-2017.

Surface Water Quality

Three Surface water samples was collected and analyzed. The analytical results are given in **TABLE-10**

TABLE-10

Location Code	Sampling details	CO-Ordinates	Sample Collection date
SW1	BoinPalli Village	16°44'16.00"N, 78°21'0.09"E	10.03.2020
SW7	500 m Upstream of Water sourcing area	16° 6'27.61"N, 78°24'29.72"E	10.03.2020
SW8	500 m downstream of Water sourcing area	16° 5'39.45"N, 78°23'57.99"E	10.03.2020

TEST RESULTES

S.No	Parameter	Units	IS:2296 Class C Limits	SW-1	SW-7	SW-8
1	pH at 25 ºC	-	6.5 – 8.5	7.82	8.06	8.22
2	Color	Hazen	300	10	50	60
3	Turbidity (NTU)	NTU	--	8.91	25.3	19.4
4	EC	µS/cm		292	275	296
5	Total Dissolve solids	mg/l	--	169	184	196
6	Total Hardness as $CaCO_3$	mg/l	--	92	70	70
7	Total Alkalinity	mg/l	1500	74	70	70
8	Calcium as Ca	mg/l	--	21.2	16.0	16.0
9	Magnesium as Mg	mg/l	--	8.8	7.2	7.2
10	Sodium as Na	mg/l		19	15	14
11	Chloride as Cl	mg/l	--	27.6	35	35
12	Residual Free Chlorine	mg/l	--	<0.02	<0.02	<0.02
13	Phenolic Compounds	mg/l	600	<0.02	<0.02	<0.02
14	Mineral Oil	mg/l	--	<0.01	<0.01	<0.01
15	Sulphate as SO_4	mg/l	0.005	20.1	29	26
16	Fluorides as F^-	mg/l	01	0.2	0.32	0.32
17	Nitrates as NO_3	mg/l	--	2.9	3.8	3.8
18	Iron as Fe	mg/l	400	0.08	0.12	0.12
19	Zinc as Zn	mg/l	1.5	<0.001	<0.001	<0.001
20	Lead as Pb	mg/l	50	<0.001	<0.001	<0.001
21	Arsenic as orc	mg/l	50	<0.001	<0.001	<0.001
22	Mercury as Hg	mg/l	15	<0.0001	<0.0001	<0.0001
23	Cadmium as Cd	mg/l	0.1	<0.001	<0.001	<0.001
24	Total Chromium	mg/l	0.2	<0.001	<0.001	<0.001
25	Copper as Cu	mg/l		<0.001	<0.001	<0.001
26	Manganese as Mn	mg/l	0.01	<0.001	<0.001	<0.001
27	Selenium as Se	mg/l	0.05	<0.001	<0.001	<0.001
28	Cyanide as CN	mg/l	1.5	<0.001	<0.001	<0.001
29	Aluminum as Al	mg/l	--	<0.001	<0.001	<0.001
30	Boron as B	mg/l	0.05	<0.001	<0.001	<0.001
31	Pesticide Residue	µg/l	0.05	<0.1	<0.001	<0.001
32	Dissolved Oxygen	mg/l	4.0	3.6	10.4	10.6
33	Chemical Oxygen Demand	mg/l	--	30	12	10
34	Biochemical oxygen Demand	mg/l	3.0	06	<3.0	<3.0
35	Coliform	MPN/250ml	--	1400	784	834
36	E. Coli	MPN/250ml	--	Not Detected	Not Detected	Not Detected

Results & Conclusions

The sampling and analysis was done as per standard methods prescribed IS: 3025 and APHA 23rd ed-2017.

Soil Quality Analysis

Six Soil samples was collected and analyzed. The analytical results are given in below **Table-12**

Table-12
Soil Quality Location:

Location Code	Soil Sampling Location	Sampling dates
S-1	Boin Palli Village	10.03.2020
S-2	Munimokesham Village	11.03.2020
S-3	Madhanapuram Village	12.03.2020
S-4	Bandanadi Gudur Village	13.03.2020
S-5	Medipalle Kalan Village	15.03.2020
S-6	Yenkepalle Village	17.03.2020

SOIL TEST RESULTS

S.No	Parameter	Units	S-1	S-2	S-3	S-4	S-5	S-6
1	Texture	-	ClayLoam	Loam	Loam	ClayLoam	Clay Loam	ClayLoam
2	Sand	%	43.6	38.8	40.5	39.2	33.9	32.4
3	Silt	%	26.2	37.5	35.2	32.2	32.3	32.6
4	Clay	%	30.2	23.7	24.3	28.6	33.8	35.0
5	pH (10% Slurry)	-	7.27	7.39	7.36	7.42	7.42	7.48
6	El. Conductivity	µs/cm	261	291	248	259	284	315
7	Organic Matter	%	1.01	1.18	0.95	1.04	1.25	1.10
8	Bulk density	gm/cc	1.45	1.62	1.65	1.41	1.02	0.93
9	Porosity	% v/v	45.4	38.7	37.6	47.6	62.5	64.9
10	S.A. R	-	0.21	0.24	0.24	0.22	0.28	0.19
11	Calcium as Ca	mg/kg	1812	1820	1725	1860	1954	1905
12	Magnesium as Mg	mg/kg	270	265	245	270	245	380
13	Sodium as Na	mg/kg	23	26	25	24	30	23
14	Potassium as K	mg/kg	146	152	135	140	168	185
15	Phosphorus as P	mg/kg	8.5	7.7	9.5	9.45	9.34	9.29
16	Chloride as Cl	mg/kg	70.4	43.4	71.5	66.7	46.1	78.1
17	Zinc as Zn	mg/kg	1.26	1.89	1.23	1.27	1.45	1.24
18	Copper as Cu.	mg/kg	1.34	1.40	1.21	1.68	1.86	2.61
19	Iron as Fe	mg/kg	12.14	14.54	12.35	11.26	16.31	10.70
20	Nitrogen as N	mg/kg	115.6	106.5	84.6	101.7	128.4	168.4
21	Organic Carbon	%	0.59	0.68	0.55	0.60	0.73	0.64
22	Sulphate as SO4	mg/kg	86.3	103.1	81.3	82.4	74.75	80.25
23	Sulphur as S	mg/kg	18.30	15.70	22.51	18.26	16.29	16.75
24	Fluoride as F	mg/kg	2.61	3.45	2.98	3.22	2.74	3.32
25	Selenium as Se	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26	Manganese as Mn	mg/kg	7.45	10.67	9.65	9.41	12.16	13.98
27	Chromium as Cr	mg/kg	6.65	5.42	6.10	6.91	4.54	5.38
28	Nickel as Ni	mg/kg	10.05	11.37	12.82	11.46	9.08	10.32
29	CEC	meq/100g	8.3	7.1	6.6	6.9	7.5	7.7

Note:

Prepared by

VISON LABS
ENVIRONMENTAL CONSULTANTS & ANALYTICAL SERVICES

Recognised by MoEF&CC, ISO 9001:2015, OHSAS 18001:2007
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FORM-B

(See rule-4/11)
Requisition for Land Acquisition

From:
S.Murali Krishna,
PRLIS Division No.04,
Mahabubnagar.

To,
The District Collector,
Mahabubnagar.

It is requested to acquire **54.10Ac.**Of land of **Kodgal** for P.R.L.I.S project/purpose and the details are furnished in Appendix enclosed along with three copies of Combined Sketch showing the lands to be acquired. It is certified that the land to be acquired was demarcated on field and all further necessary information and assistance will be provided on the date/time appointed /stipulated by you.

It is requested to acquire land as per provisions of Sections 23 and 30 A of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (Central Act No. 30 of 2013) as amended by the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (Telangana Amendment) Act, 2016 (Act No. 21 of 2017).

Form - A is enclosed exempting the project from the provisions of Chapter II and Chapter III of the Act.

Requisite cost of acquisition including R&R will be deposited in your office as and when required.

Yours faithfully,

Executive Engineer,
PRLIS Division No.04,
Mahabubnagar.

Appendix to Form - B (1)

(i)Name of the District: Mahabubnagar

(ii) Name of the Project:P.R.L.I.S Project

(iii) Details of Land proposed for Acquisition

Name Of Mandal	Name Of Village	Survey No.	Extent in Ac
Jadcherla	Kodgal	831	0.12
Jadcherla	Kodgal	832	4.20
Jadcherla	Kodgal	833	0.64
Jadcherla	Kodgal	834	0.49
Jadcherla	Kodgal	826	0.20
Jadcherla	Kodgal	825	1.73
Jadcherla	Kodgal	824	2.97
Jadcherla	Kodgal	823	0.89
Jadcherla	Kodgal	799	0.59
Jadcherla	Kodgal	819	0.32
Jadcherla	Kodgal	816	0.67
Jadcherla	Kodgal	817	0.96
Jadcherla	Kodgal	812	0.37
Jadcherla	Kodgal	813	1.85
Jadcherla	Kodgal	805	0.44
Jadcherla	Kodgal	804	0.72
Jadcherla	Kodgal	803	0.17
Jadcherla	Kodgal	739	0.57
Jadcherla	Kodgal	740	0.44
Jadcherla	Kodgal	742	1.43
Jadcherla	Kodgal	741	0.01
Jadcherla	Kodgal	743	0.86
Jadcherla	Kodgal	744	0.40
Jadcherla	Kodgal	745	1.11
Jadcherla	Kodgal	716	0.54
Jadcherla	Kodgal	717	0.96
Jadcherla	Kodgal	718	1.26
Jadcherla	Kodgal	715	0.67
Jadcherla	Kodgal	702	0.40
Jadcherla	Kodgal	572	1.73
Jadcherla	Kodgal	573	3.48
Jadcherla	Kodgal	576	0.49
Jadcherla	Kodgal	574	0.57
Jadcherla	Kodgal	575	3.21
Jadcherla	Kodgal	568	0.96
Jadcherla	Kodgal	564	6.08
Jadcherla	Kodgal	567	1.33
Jadcherla	Kodgal	566	0.25
Jadcherla	Kodgal	565	0.07
Jadcherla	Kodgal	489	0.77
Jadcherla	Kodgal	487	3.29
Jadcherla	Kodgal	486	4.35
Jadcherla	Kodgal	484	1.51
		TOTAL	54.10

(iv)Total area under Requisition in 54.10Ac.
(v) Are any religious structures, grave yard or tomb etc proposed for acquisition ------ No.

Yours faithfully,

Executive Engineer,
PRLIS Division No.4
Mahabubnagar

FORM-B

(See rule 4/11)
Requisition for Land Acquisition

From:
S.Murali Krishna,
PRLIS Division No.04,
Mahabubnagar.

To,
The District Collector,
MAHABUBNAGAR.

It is requested to acquire **150.84**Ac.Of land of **Nasrullabad** for P.R.L.I.S project/purpose and the details are furnished in Appendix enclosed along with three copies of Combined Sketch showing the lands to be acquired. It is certified that the land to be acquired was demarcated on field and all further necessary information and assistance will be provided on the date/time appointed /stipulated by you.

It is requested to acquire land as per provisions of Sections 23 and 30 A of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (Central Act No. 30 of 2013) as amended by the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (Telangana Amendment) Act, 2016 (Act No. 21 of 2017).

Form - A is enclosed exempting the project from the provisions of Chapter II and Chapter III of the Act.

Requisite cost of acquisition including R&R will be deposited in your office as and when required.

Yours faithfully,

Executive Engineer,
PRLIS Division No.04,
Mahabubnagar.

Appendix to Form - B (1)

(i)Name of the District: Mahabubnagar

(ii) Name of the Project:P.R.L.I.S Project

(iii) Details of Land proposed for Acquisition

Name Of Mandal	Name Of Village	Survey No.	Extent in Ac
Jadcherla	Nasrullabad	541	12.68
Jadcherla	Nasrullabad	535	9.41
Jadcherla	Nasrullabad	534	0.89
Jadcherla	Nasrullabad	536	0.74
Jadcherla	Nasrullabad	533	2.77
Jadcherla	Nasrullabad	537	0.00-0
Jadcherla	Nasrullabad	520	5.14
Jadcherla	Nasrullabad	521	6.20
Jadcherla	Nasrullabad	522	0.52
Jadcherla	Nasrullabad	517	1.19
Jadcherla	Nasrullabad	468	7.41
Jadcherla	Nasrullabad	514	0.25
Jadcherla	Nasrullabad	513	2.42
Jadcherla	Nasrullabad	496	5.68
Jadcherla	Nasrullabad	506	6.77
Jadcherla	Nasrullabad	505	3.93
Jadcherla	Nasrullabad	559	3.93
Jadcherla	Nasrullabad	560	0.25
Jadcherla	Nasrullabad	613	5.36
Jadcherla	Nasrullabad	611	1.83
Jadcherla	Nasrullabad	612	3.73
Jadcherla	Nasrullabad	640	4.72
Jadcherla	Nasrullabad	643	2.15
Jadcherla	Nasrullabad	644	0.62
Jadcherla	Nasrullabad	645	2.94
Jadcherla	Nasrullabad	647	5.68
Jadcherla	Nasrullabad	649	0.05
Jadcherla	Nasrullabad	601	0.00
Jadcherla	Nasrullabad	730	6.30
Jadcherla	Nasrullabad	731	1.09
Jadcherla	Nasrullabad	729	1.66
Jadcherla	Nasrullabad	716	8.13
Jadcherla	Nasrullabad	717	0.15
Jadcherla	Nasrullabad	723	1.73
Jadcherla	Nasrullabad	721	6.18
Jadcherla	Nasrullabad	748	4.03
Jadcherla	Nasrullabad	720	4.69
Jadcherla	Nasrullabad	803	1.66
Jadcherla	Nasrullabad	781	0.49
Jadcherla	Nasrullabad	780	8.75
Jadcherla	Nasrullabad	783	4.32
Jadcherla	Nasrullabad	785	4.37
		TOTAL	**150.81**

(iv)Total area under Requisition in 150.81 Ac.

(v) Are any religious structures, grave yard or tomb etc proposed for acquisition ------ No.

Yours faithfully,

Executive Engineer,
PRLIS Division No.4

Public Hearing Attendance Sheet

Mahbubnagar

ENVIRONMENTAL PUBLIC HEARING

Proposed Palamuru - Rangareddy Lift Irrigation Scheme for lifting of 90 TMC of flood water in 60 days during the flood season from foreshore of Srisailam reservoir and canal network will be developed from the reservoirs to create irrigation to upland areas of Mahabubnagar, Nagarkurnool, Rangareddy, Narayanpet, Vikarabad & Nalgonda Districts for an ayacut of 4,97,976 Ha(12,30,000 Acres) (Canal network in phase - 2) The major components of the project in Mahabubnagar District consists of canal network to irrigate an ayacut of 2,35,318 acres of upland areas in 247 villages of 13 Mandals in Mahabubnagar District.

PUBLIC HEARING at :

Date: [illegible], Time: 11:00 AM;
Venue: MPP office, Hanwada (V& M),
Mahbubnagar District of Telangana State.

Name of the Project:

M/s.Palamaru-Rangareddy Lift Irrigation Scheme (PRLIS)
Canal Network - Phase-II (Irrigation)
Irrigation and CAD Department,
Government of Telangana,
Telangana State.

Sl. No.	Name and Designation of the Official	Signature
(1)	Sri S. Venkata Rao, IAS District Collector & Magistrate Mahaboobnagar Dist	
(2)	Sri K. Seetharama Rao Addl. Collector Mahaboobnagar Dist	
(3)	Sri Tejas Nandlal Pawar, IAS Addl. Collector (Local Bodies) Mahaboobnagar Dist	
(4)	Sri. D. Narsing Rao, SE Irrigation Circle No. 1 Mahaboobnagar Dist	10/09

Sl.No	Name	Phone No.s	Designation	Village	Signature
1	B. Nagaraju		Ex. MPTC	Hunasakunta	
2	N. Somu		Ex ZPTC	Hunasakunta	N.Somu
3	K. Laxmaiah		Ex Upsc-mpp	Hunasakunta	K.Laxmaiah
4	A. Balaji		Ex-Sarpanch	Thirumalgiri	A. Balaji
5	M. Venu			Konaipalli	M.V.Rao
6	K. Jyothi		Nehru Sarpanch	Nagamkunta Thanda	
7	A. Ramulu			Sallurpally	
8	B. Dattatreya		Goud	Budhagam	
9	V. Chennaiah		Ex MPTC	Bommakal	
10	T. Kanakaiah			Bheemaram	
11	D. Anjaneyulu			Hunasakunta	
12	K. [illegible]			[illegible]	
13	M. Raju yadav			Tanneeru	
14	A Balaraju			Sallurpally	
15	K. Venkataiah			Kistampally	
16	B. Yadaiah			Ibrahimbad	
17	A. Ram Reddy			Konaipalli	
18	Yadagiri Reddy			Kistampally	
19	Ashok			Midil	
20	K. Shankar		(Sarpanch)	Thirumalgiri Thanda	
21	T. Peeraiah			Veeravelli	
22	G. Yadagiri		(Ex Sarpanch)	Jaleelpur	
23	M. Manohar		Wyra MPTC	Jaleelpur	
24	[illegible]				
25	E. Mallu		M.P.P.	Madri	
26	Jogu Krishna		Goud (TRS youth)	Gaddipalli	
27	P. Venkata Ram Reddy		Sarpanch	Gaddipalli	
28	M. Srinivas		Ex ZPTC	Gaddipalli	
29	M.d. Saleem		Comm Mandal	9553217175	
30	M. Krishna		A.E. Irr.	9491527291	
31	Ch. Srinivasulu		Gund AEE Irr.	9441105	

Sl.No.	Name & Designation of the officer	Signature	Sl.
1	P. Ram Reddy RDO & EO ICAD	Ram	1
2	T. Venkatyham Vice Chairman ZP Exp. Dr.		2
3	V. [illegible] EE & Members Block Support		3
4	A. Venkata [illegible] Executive Engineer Irrigation		4
5	Ch. Madhu, DOE		5
6	Laxmi Narayana Tahasildar Jadcherla		6
7	J. Shamsheer, Dy. Tahsildar, MBNR Bheema project		7
8	Sudarshan Reddy RI T/o Jadcherla		8
9	M. Vasu		9
10	[illegible]		10
11	R. Chandra, Dy EE Irrigation, Devarkadra		11
12	R. [illegible] Irrigation [illegible]		12
13	C.N. Sreenivas AE/PR MP Hanwada		13
14	[illegible] Dy EE I&CAD Division-2 PVK		14
15	M. Venkata Ramana Dy EE Mahabubnagar		15
16	L. Chandrashekaram, EE Irrigation Division No.2, MBNR		16
17	G. Hanumanthu, DEE, Irrigation Sub-Division-II, MBNR		17
18	M. [illegible] Hanwada AE IP Hanwada		18
19	C. Tulasi Ram A.E C.A.D Irrigation Dept		19
20	S. Krishna Mohan, EE, Irrigation Dn, MBNR		20
21	D. Venkateshwarlu DPRO MBNR		21
22	Bekka Srinivasulu, Tahasildar Hanwada		22

Sl No	Name	village	Signature	Sl No
2	Mallipudi Venkataiah Telangana Vyavasaya Urthi dorula Union — TVVU 9440937490, email: tvvu.2010@gmail.com	Telangana		
32	B. Raju TVVU	Gollapalli	B. Raju	
34	T. Mukesh TVVU	Bangaseddy		
55	K. M. Narayana	Nanchala		
36	P. Prabhakar Reddy	Kommaddipalli		
37	Venkat yadav	Peddamul		
38	shanka Naik	Elkicherla		
39	Sathyabama	Mahadevpur		
40	[illegible]	Konkova		
41	K. Dineshkumar	Ippalapally		
42	K. Padmanaga Reddy	Ippalapally		
43	Samapika Mishra Voyants Solutions Private Ltd., Gurgaon		Samapika Mishra	

Attendence Register for VIP's

for

PRLIS Environmental Public Hearing

Venue: MPP office, Hanwada, Mahabubnagar District.

Date: 10-08-2021 From 11:00AM

Attendence Register for VIP's

S.No	Name	Designation	Contact No.	Signature
1	2	3	4	5
1	S. Venkateshwar IAS	Collector & D-M	9494943065	
2	Tejas Nandlal Pawar, IAS	Additional Collector, (L.B)	9830061263	
3	K. Seeta Rama	Addl. Collector.		
4	D. Narsing Rao	SE/Irrigation	9393887650	10/02/21
5	M. Dayanand	EE/TSPCB	9866276201	
6	P. Ram Reddy	SE Irrig(R)	7702946455	
7	T. Venkateshwara	SE Irrig	9701362409	
8	V. [illegible]	E.E. [illegible]	7893211114	
9	Mogulappa	Dy. CEO ZP.	8008901004.	10/02/2021
10	A. padma Rao	Spl. Collector (Irrg.)	8019555968	
11	Ramapaka Mishra	Cost effective, Voyants solutions Pvt Ltd	9640357571	Ramapaka mishra
12	Thasleem Begum	AEO/TSPCB	6304007833	
13	M. Venkata Ramesh	DEE/Irrigation	97013 62605	
14	S. Krishnamohan	EE/Irrigation	7331180567	
15	U. Venkateshwarlu	DRO/AO	9949351685	

Register - 1

Attendence Register for Public

for

PRLIS Environmental Public Hearing

Venue: MPP office, Hanwada, Mahabubnagar District.

Date: 10-08-2021 From 11:00AM

1	Jogo. Krishnagoud	Gaudu	Gaudu	9959180805	
2	Sambaiya Reddy	MBNR	MBNR	9704577003	
3	Sri Vijay Bhaskar	MBNR	MBNR	9494726733	
4	T. Vijay Bhaskar	MBNR	MBNR	8008013377	
5	Baswaraj.	MBNR	MBNR	9490955547	
6	VG Ramulu	Kistampally	Hanwada	—	
7	Thirmaiah	Kistampally	Hanwada	838422	
8	M Raj Naik	M.M. Kunta Tanda	Hanwada	—	
9		Nanchala	Mahbubnagar	9550586	
10		Madhavaram	Hanwada	9891206	
11		Tallapally	Hanwada	9603703	
12		Tallapally	Hanwada	9160	
13	T. Pentaiah	Yapur	H.N.W.D	9676	
14	K Pantanga Reddy	Thirpally	M.Nagar	9440200911	
15	K Ganesh Kumar	Thirpally	MBNR	9959665795	

16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17	M. Sunder Rao Mr. Ramdas	Hanwada Hanwada	Hanwada Hanwada	9440745248 9730073141	
18	Anjaneyulu Prasad Goud	Hanwada Hanwada	Hanwada Hanwada	9912999264 [illegible]	
19					
20	Bandaravelli	Appa Pandu	Hanwada	[illegible]	
21	Hanamanthu	Appa Pandu	Hanwada		
22	Kishan Naik	Appa Pandu	Hanwada	8500280354	
23	Y. Venkataiah	Dudhiwara	Hanwada	-	
24	Laxmaiah	Nanchela	Mardabad		Laxmaiah
25	Kishanaiah	Hanwada	Hanwada	9440707485	
26	M. Anjanaiyalu	MBNR	MBNR	9542486294 9542486285	
27	K. Anantham	[illegible]	[illegible]	9652558575	
28	Raju	[illegible]	Hanwada	9959593115	
29	Hanamaiah	Konageta Pally	Hanwada	-	
30	Poddaiah	Konageta Pally	Hanwada	-	Poddaiah
31	Satyaiah	Konageta Pally	Hanwada	8500626671	

32	Angaaegela	Hunuuda	Hunuuda	9ECC8	462
33					
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Register - 2

Attendence Register for Public

for

PRLIS Environmental Public Hearing

Venue: MPP office, Hanwada, Mahabubnagar District.

Date: 10-08-2021 From 11:00AM

1	M. Manohar	Jainalli[illegible]	MBNR	9963393955	M
	G. Yadaiah.				
2	G. Yadaiah	Jainalli[illegible]	MBNR	9701097105	G. Yadaiah
3	V. Chennaiah	Bojannu	Hanwada	9989[illegible]52	
4	[illegible]	[illegible]	Hanwada	9553901564	
5	D. Anjaneyulu	Hanwada	Hanwada	9440672736	
6	K. [illegible]	[illegible]	[illegible]	9866180774	
7	A. Balaraju	Gollonipally	Hanwada	7993685365	
8	M. Raju Yadav	Tantara	Hanwada	9553662314	
9	K. Venkataiah	Kistampally	Hanwada	9440635621	K. Venkat
10	S. Yadagiri Rao	Kstampally	Hanwada	9000555584	
11	A. Ramaiah	Kanaipally	Hanwada	9440777697	
	B. Yadaiah	Ibrahimabad.			
12	B. Yadaiah	Ibrahimabad.	Hanwada	7893177014	
	K. Sekhar				
13	K. Sekhar	A.T.P	A.T.P	8008280746	K. Sekhar
	R. Narasimhulu	ATP	ATP	9849053202	
14	R. Narasimhulu	ATO	ATO	9849053202	
15	P. Kanta	Area Mgr. ATP	Nalgonda	9550639511	
16	B. Ashok	Midjil	Midjil	7702162466	B. Ashok

17	K. Shankar	Thuragaddla Thanda	MBNR Rural	9701187212	
18	H. Mohan	Thuragaddla Thanda	MBNR Rural	9948336644	
19	H. Vijay Bhaskar	MBNR	MBNR	9494267122	
20	[illegible]	MBNR	MBNR	9704577803	
21	P. V. Bhaskar	MBNR	MBNR	8008013777	
22	[illegible]	[illegible]	Hanumakonda		
23	[illegible]	11			
24	T. Pentaiah	Vepur	[illegible]	9676448655	
25	AJU				
26	[illegible]			[illegible]	
27	[illegible]	[illegible]	[illegible]	11	
28	Saleem	[illegible]	[illegible]	9553217171	
29	Jogo. Krishna Goud	Gaudeet	Gaudeet	9959180601	
30	M.P.P.	Gaudid	Gaudid	7893160164	
31	Srinivas Reddy	ZPTC Gaudur	Gaudeet	9959016840	
32	Bramma Reddy	Gaudeet	Gaudeet	9177836335	

33	K. Laxmaiah	Hanmakonda	Hanmakonda	9440914739	K.L.
34	B. Nagaraju	Hanmakonda	Hanmakonda	8978430590	
35	A. Balaji	Thirumalgiri	Hanmakonda	9441161367	A.B.
36	M.V. Ramulu	Kothagudem	Hanmakonda	[illegible]	M.V.R.M
37	[illegible]	[illegible]	[illegible]	[illegible]	
38	K. Bhaskar Reddy	[illegible]	[illegible]	7618341159	
39	K. Keshav	Hanmakonda	[illegible]	9490395550	
140	Ajaygoud. K	Ex-State Chairman	MBNR	9948449420	
	Mallesh Nagamalla	Distt Rytu	"	94402 97953	
141	" Devender Reddy	Mandal Rythu		9248401650	
142	Raghavender goud	MPP member		9849942960	B.R.
143	Ramulu Ranga Reddy	Vice MPP member		8500333423	
144	M. VENKAIAH TVVU.	MBNR	Mahabubnagar	9440037490	
145	T. Mahesh TVVU	Rangareddy	Choutuppal	8897112864	
146	Rajeshwar Reddy	Kamareddy	Banthpur	9989888507	
147	K. Jaipal Reddy	Kothur	Bothpur	8074652753	
148	D. Chandrashekar	Kothlabad	Koilkonda	9369742703	

49	A. Lakshmaiah	Kothakal	Kollkade	7288193628	
50	J. Bheemaiah	Gondlad	Kom Reddypally	9441189653	
51	G. Nivaskar	Tandur	Hanwada	9160546456	
52	B. Jangiraiah	Tandur	Hanwada	9603703086	
53	Sakal Raju A. Suresh.	Tandur	Hanwada	9018501709	
54	A Suresh. Tobe	Mandal	Hanwada	79 818 06755	
55	T. Pentiah	Velpur	H. No. 1-1	9676 [illegible] 5.	
56	[illegible]	[illegible]		6301626876 [illegible]	
57	[illegible]	[illegible]	[illegible]	9963196 [illegible]	
58	[illegible]	[illegible]	[illegible]	94-887161 [illegible]	
59	K. Pattanaya Reddy	Ippalapally	M.N.R.L.R.)	9014 270911	
60	K. Dineshkumar	Ippalapally	M.B.N.R.(D)	9959665165	
61	[illegible]	[illegible]	[illegible]	9505993814	
62	M. Babu	Pantipally	MBNR	9666320720	
63	Prabhakar	[illegible]	[illegible]	9789240 35	
64	Usha Nain	[illegible]	Hanwada	8309944955	

65	T.L Narayan	[illegible]	[illegible]	9441615991	[illegible]
66	S. Bhagavanth [illegible]	Bhathiacharya	Hemmady	9448608481	[illegible]
67	N. Satyanarayana [illegible]	Nandavara	Balavagar	9963973077	[illegible]
	S. Raghavan	Narayanan	Balavgara	9866665770	
68	Srinivasulu [illegible]	M B N R	Rayadurg	9010971077	[illegible]
69	[illegible]	Balavgar	Balavgar	9963434824	[illegible]
70	M. Ramulu	Nadavara	Balavgar	9989321447	[illegible]
71	K. Ramakrishnan	Kadiramu	Hanumadas	9618144396	[illegible]
72	P. [illegible]	[illegible]	[illegible]	9573472777	[illegible]
	Y. Srikanth Reddy	[illegible]	[illegible]	7093377729	[illegible]
73	Y. Srikanth Reddy	M.Bad	Hindupur	7093371729	[illegible]
74	[illegible]	[illegible]		9127113917	[illegible]
75	[illegible]				[illegible]
76	M. Suresh Raj	Hanumadas	Hindupur	9441300038	[illegible]
77	Krishnamurthy			9949119957	[illegible]
	Ramdas	Veerapa	Hanumanthu	9730073141	
78	Ramdas	Veerappa	Hanumanthu	9730073141	[illegible]
79	K [illegible]	[illegible]	[illegible]	7702468330	[illegible]
80	[illegible]	[illegible]	[illegible]	7093913377	[illegible]

81	A. [illegible]	Sa[illegible]	Cradock	9866[illegible]	A.
82	M. Shamber [illegible]	Ammapattinam	Hanmda	9908[illegible]	
83	E. Masaiah	Baddam	"	9701[illegible]	E.
84	C. [illegible]	Badepally	Jadcherla	7396[illegible]	
85	M. R. Balakrishna	Jadcherla	Jadcherla	7993[illegible]	
86	G. Ramachandra	Atoor	"	7396[illegible]	
87	M. Shekar Reddy	Moor	Jadcherla	9959[illegible]	
	V[illegible]				V[illegible]
88	[illegible]	V[illegible]			
89	B[illegible]	Idaimbed		9004[illegible]	B[illegible]
90	K[illegible]	"	Hanmada	9441[illegible]	
91	T[illegible]	"	"		T[illegible]
92	MAsaneyulu	MBNR	MBNR	9542[illegible]	
93	K. Dhanaj	Gudimallapur	M.B.N.R	9542-[illegible]	
94	N[illegible]	N[illegible]	[illegible]	4377[illegible]	
95	S. Savithri	Vepur	Hanmada	8106[illegible]	
96	N. Rajeshwari	Gundal	Hanmada	8309[illegible]	R. Rajeshwari

97	Peddi Ramulu	Jadcherla	Jadcherla	9397669993	
98	కొండయ్య	madanshikam	Hanmakonda	9897277711	
99	Ch. Pentaiah	kondareddy	"		
100	J. Arun	Kothapet	"	9704186351 2	
101	T. Ramulu	Kothapeta	"	9985564761	
102	P. Yadaiah	Nakrekal	Hanmakonda	9866347899	
103	B. Yakaiah	Jadcherla	Hanmakonda	7893717016	
104	A. Basi Reddy	Kmaqtpally	Hanmakonda	9440770971	
105	K. Buchi Reddy	Nallavelly	Kazipet	8008118290	
106	[illegible]	[illegible]		7075702701	
107	[illegible]	[illegible]	[illegible]	[illegible]	
108	K. Ravi	[illegible]	[illegible]	6301641094	
109	I. Krishnaiah	Peddadupally	Hanmakonda	9505333383	
	K. Raju	Bapunaikthanda Gandeed		8340333499	
110	K. [illegible]	[illegible]		6301628667	
111	[illegible]	[illegible]	Hanmakonda		
112	[illegible]	"	"		

Minutes of Meeting-Public Hearing

Mahbubnagar

పాలమూరు రంగారెడ్డి ఎత్తిపోతల పథకం (PRLIS) – దశ – 2 (నీటి పారుదల) గురించి నీటి వనరుల శాఖ-తెలంగాణ ప్రభుత్వము వారి దశ – 2 కు సంభందించిన పర్యావరణ ప్రజాభిప్రాయము తెలుసుకోవడానికి సమావేశము , మహబూబ్ నగర్ జిల్లాలో తేది 10.08.2021 ఉదయము 11:00 గంటలకు యం.పి.పి కార్యాలయం, హన్వాడ (గ్రా మరియు మం), మహబూబ్ నగర్ జిల్లా నందు నిర్వహించారు.

క్రమ సంఖ్య	ప్యానెల్ సభ్యుని పేరు	విభాగము
1.	శ్రీ ఎస్. వెంకట్ రావు, జిల్లా కలెక్టర్ & మెజిస్ట్రేట్, మహబూబ్ నగర్ జిల్లా.	ప్రభుత్వ ప్రతినిధి మరియు జిల్లా పరిపాలన మరియు చైర్మన్ పర్యావరణ ప్రజాభిప్రాయము
2.	శ్రీ ఎం.డియానంద్ పర్యావరణ ఇంజనీర్, తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి , ప్రాంతీయ కార్యాలయము, హైదరాబాద్	తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి ప్రతినిధి మరియు కన్వీనర్ పర్యావరణ ప్రజాభిప్రాయము

పర్యావరణ విషయంలో ప్రజాభిప్రాయాన్ని తెలుసుకోవడానికి ఈ క్రింద తెలిపిన ప్రభుత్వ విభాగ అధికారులు సమావేశము నందు పాల్గొనుచున్నారు.

1.	శ్రీ చేజర్ల నందలాల్ పవార్, I.A.S , అదనపు కలెక్టర్ (స్థానిక సంస్థలు), మహబూబ్ నగర్
2	శ్రీ. కె. సీత రామారావు, అదనపు కలెక్టర్ (రెవెన్యూ), మహబూబ్ నగర్
3	శ్రీ. వి. సర్వింగ్ రావు, సూపరింటెండింగ్ ఇంజనీర్, I & CADA., ఇరిగేషన్ సర్కిల్ నం .1, మహబూబ్ నగర్
4	శ్రీ ఎస్. కృష్ణ మోహన్, ఎగ్జిక్యూటివ్ ఇంజనీర్, I & CADD., ఇరిగేషన్ డివిజన్ నం. 4, మహబూబ్ నగర్

కింది కన్సల్టెంట్ పర్యావరణ పబ్లిక్ హియరింగ్‌లో పాల్గొన్నారు:

1.	కుమారి సంపిక , పర్యావరణ సలహాదారు ,గుమ్మడి, టోయంట్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్

మహబూబ్ నగర్ జిల్లా మరియు చుట్టుపక్కల ఉన్న గ్రామస్థులు కనీసంగా 150 మంది ప్రజలు పర్యావరణ ప్రజాభిప్రాయం లో తమ అభిప్రాయాలను చెప్పడానికి హాజరైనారు.

ప్రారంభంలో, సమావేశానికి స్వాగతం పలుకుతూ, పర్యావరణ ఇంజనీర్, ప్రాంతీయ కార్యాలయం- పర్యావరణం, అడవులు మరియు వాతావరణ మార్పుల మంత్రిత్వ శాఖ, భారత ప్రభుత్వం నోటిఫైడ్ ఎన్విరాన్మెంట్ ఇంపాక్ట్ అసెస్‌మెంట్ నోటిఫికేషన్ (EIA), 2006 వీడియా SO (E) నం .1533 గురించి వివరించారు. . తేదీ 14-09-2006. నోటిఫికేషన్ ది యొక్క పర్యవేక్షణలో 27.01.1994, ఏ ఏ ప్రాజెక్టులు నోటిఫికేషన్ ప్రకారం, పర్యావరణానికి సంబంధించిన సంభావ్య ప్రభావాల ఆధారంగా కొన్ని ప్రాజెక్టులు / కార్యకలాపాలకు (షెడ్యూల్‌లో జాబితా చేసినట్లుగా) ముందుగా పర్యావరణ క్లియరెన్స్ అవసరం. నోటిఫికేషన్‌లో పేర్కొన్న విధానానికి అనుగుణంగా. నోటిఫికేషన్ కింద ఉన్న ప్రాజెక్టులకు పర్యావరణ పబ్లిక్ హియరింగ్ తప్పనిసరి ప్రక్రియ. ప్రతిపాదిత పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీమ్ లసేది సాగునీటి ప్రాజెక్ట్, ఇది ఏ ఏ పేర్కొన్న నోటిఫికేషన్ కింద వర్గం A (1 (c) (i) - ≥ 50,000 హెక్టార్ల ఏరియా కింద సాగునీటి ప్రాజెక్టులు). నోటిఫికేషన్ ప్రకారం, కేటగిరీ-ఎ మరియు కేటగిరీ-బి 1 కింద ప్రాజెక్టులు పబ్లిక్ కన్సల్టేషన్ చేపట్టాలి, దీని ద్వారా ప్రాజెక్ట్ యొక్క పర్యావరణ ప్రభావాలలో ఉన్న స్థానిక వ్యక్తుల అభ్యంతరాలు తెలుసుకోవచ్చని తెలిపారు.

ప్రతిపాదిత ప్రాజెక్టు యొక్క పర్యావరణ ప్రజాభిప్రాయం కోసము నీటి పారుదలశాఖ వారు తమ లేఖను 07.07.2021 నాడు అందించారు దానికి గాను 10.07.2021 న కలెక్టర్ మహబూబ్‌నగర్ గారికి వేట ను పంపియడమి జరిగినది అయిన సమావేశాన్ని 10.08.2021 న నిర్వహించాలని తెలియజేశారు నోటీసుల స్థానం, ప్రజాభిప్రాయము గురించి ప్రెస్ నోటిఫికేషన్ 10.07.2021 న తెలుగు మరియు ఇంగ్లీష్ దినపత్రికలలో సమస్త తెలంగాణ న్యూస్ పేపర్ మరియు ది హిందూ ఇంగ్లీష్

డైలీ న్యూస్ పేపర్ లో ప్రచురించబడింది. ఈ ప్రాజక్ట్ గురించి స్థిక్యూటివ్ సారాంశాలు తెలుగు మరియు ఆంగ్లంలో ఏలంధిత గ్రామపంచాయతీలు మరియు ఇతర కార్యాలయాలలో ప్రదర్శించబడ్డాయి మరియు ఇంటర్నెట్ / వెబ్‌సైట్‌లో కూడా అందుబాటులో ఉంచబడ్డాయి.ఈ ప్రతిపాదన గురించి తమ అభిప్రాయాలను తెలుపవలసిందిగా ప్రజలను అభ్యర్థించారు మరియు పర్యావరణ పబ్లిక్ హియరింగ్, కలెక్టరు మహబూబ్‌నగర్ వద్ద గురించి బహిరంగ విచారణకు అధ్యక్షత వహించాలని మరియు ప్రొసీడింగ్‌లు నిర్వహించాలని అభ్యర్థించారు.

శ్రీ ఎస్. వెంకటరావు, IAS, కలెక్టర్ మరియు జిల్లా మేజిస్ట్రేట్, మహబూబ్ నగర్ సమావేశంలో అధికారులు, ప్రజా ప్రతినిధులు, పత్రికా, రైతులు, NGO లు మరియు ప్రజలను స్వాగతించారు మరియు పర్యావరణ సమస్యలపై అభిప్రాయం, సూచనలు ఇవ్వాలని ప్రజలను అభ్యర్థించారు పాలమూరు రంగారెడ్డి ప్రాజెక్ట్ మహబూబ్ నగర్ జిల్లా ప్రజల కల అని ఆయన తెలియజేశారు . ఇది పూర్వపు మహబూబ్‌నగర్ మరియు రంగా రెడ్డి జిల్లాల తాగునీరు, నీటిపారుదల మరియు పారిశ్రామిక వాడకం అవసరాలను తీర్చే ప్రాజెక్ట్ అని తెలిపాడు.

పర్యావరణ ప్రజాభిప్రాయము ప్రక్రియ మొత్తం వీడియో గ్రాఫ్ చేయబడుతుంది మరియు వీడియో సీడీ ప్రభావరణం & అడవులు మరియు వాతావరణ మార్పు మంత్రిత్వ శాఖకు (MoEF & CC), ప్రాజక్ట్ గురించి ప్రజల నుండి స్వీకరించబడిన అభిప్రాయాలు మరియు వ్యాఖ్యలతో పాటు సంబంధిస్తుంది అని ఆయన తెలిపాడు

ప్రతి సూచన మరియు ఆభ్యంతరాలను సంబంధిత ప్రభుత్వ అధికారులు పరిగణనలోకి తీసుకుంటారని మరియు ప్రాజెక్ట్ గురించి సాంకేతిక వివరాలను సూపరింటెండింగ్ ఇంజనీర్, I & CADD, ఇరిగేషన్ సర్కిల్ నం .1, మహబూబ్ నగర్ మరియు డూ సికరణ వివరాలను ఆదనపు కలెక్టర్ వివరిస్తామని వీర్కొన్నారు. ఎన్విరాన్‌మెంటల్ ఇంపాక్ట్ అసెస్‌మెంట్ వివరాలను వయోంట్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్ నుండి కన్సల్టంట్ వివరిస్తారు ఆయన తెలిపాడు

ప్రాజెక్ట్ గురించి వివరించమని నీటిపారుదల శాఖ సూపరింటెండింగ్ ఇంజనీర్‌ను అభ్యర్థించారు.

శ్రీ డి.సర్వింగ్ రావు, సూపరింటెండింగ్ ఇంజనీర్ ప్రతిపాదిత ప్రాజెక్ట్ వివరాలను మరియు దాని ప్రయోజనాలను ఈ క్రింది విధంగా వివరించారు:

తెలంగాణ రాష్ట్రంలో కొత్తగా పునర్వ్యవస్థీకరించిన మహబూబ్ నగర్, నాగర్ కర్నూల్, నారాయణపేట, రంగారెడ్డి, వికారాబాద్, నల్గొండ జిల్లాలు దేశంలోని కరువు బారిన పడే అత్యంత సంక్లిష్ట ప్రాంతాలుగా ఎప్పటినుంచో ఇక్కడ తాగునీటికి కూడా తీవ్రలేమి ఉంది. ఈ కారణంగా ఈ జిల్లాల్లోని ప్రజలు బతుకుదెరువు కోసం దేశంలోని పలు ప్రాంతాల వలసలు పోతున్నారు. ఉన్న నీటిలో ఫ్లోరైడ్ పరిమాణం అధికంగా ఉండటం సమస్యను మరింత తీవ్రం చేస్తోంది. ఈ జిల్లాల్లో మొత్తం సాగుకు అందుబాటులో ఉన్న నేలలో సింహభాగం సాగు చేసిన ప్రాంతం చాలా తక్కువగా ఉంది. ఈ పరిస్థితిని చక్కదిద్దేందుకు, ఈ కరువు ప్రభావిత ప్రాంతంలోని కష్టాలను తొలగించేందుకు తెలంగాణ రాష్ట్ర ప్రభుత్వం పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీమ్ (PRLIS)ను చేపట్టింది

ఈ ప్రాజెక్ట్ కోసం శ్రీశైలం రిజర్వాయరు వెనుక జలాల నుంచి 90 టీఎంసీల వరద నీటిని 60 రోజులలో తోడి 5 దశలలో ఎత్తపోసి 6 రిజర్వాయర్లు నింపి 6 జిల్లాలలోని 70 మండలాల్లో 12,30,000 ఎకరాలకు సాగు నీరు, 1226 గ్రామాలకు తాగునీరు మరియు పరిశ్రమలకు నీరు ఇవ్వడము జరుగును.

ఈ ప్రాజెక్టును రెండు దశలలో చేపట్టటం జరుగుతుంది.

ప్రాజెక్టు మొదటి దశలో తాగు నీటి వినియోగం, పారిశ్రామిక అవసరాలు, సాగునీటికి అవసరమైన నీటి లిఫ్టింగ్, నిల్వకు సంబంధించిన ప్రాదమికంగా లభ్యపై ధాపెల్ల, ఓపెన్ కెనాల్స్ (50.490 కి.మీ), సొరంగాలు (61.577 కి.మీ), సంప్ హౌజులు (5), అంజనగిరి రీజాంబనెయు, వెంకటాద్రి, కురుమూర్తిరాయ, ఉదండాపూర్, కే.పి లక్ష్మీదేవిపల్లి రిజర్వాయర్లు (6- మొత్తం 67.97 టీఎంసీ నీటి నిల్వ చేసే సామర్థ్యం కలిగినవి) నిర్మాణ పనులు ఉంటాయి.

ప్రాజక్టు రెండో దశలో వెంకటాద్రి, కురుమూర్తిరాయ, ఉదండాపూర్, కే.పి లక్ష్మీదేవిపల్లి రిజర్వాయర్లు ద్వారా 12,30,000 ఎకరాలకు సాగునీరు సరఫరా చేసేలా 13 ప్రధాన కాలువలు (మొత్తం పొడవు 915 కి.మీ) మరియు డిస్ట్రిబ్యూటరీ నెట్ వర్క్ నిర్మాణపనులు ఉంటాయి

మహబూబ్ నగర్ జిల్లాలో ఈ ప్రాజెక్ట్ కింద 13 మండలాల్లోని 247 గ్రామాల్లో వెంకటాద్రి, కురుమూర్తిరాయ, ఉదండాపూర్ మరియు కే.పి లక్ష్మీదేవిపల్లి రిజర్వాయర్ల ద్వారా మిగిలే కాలువల ద్వారా సుమారుగా 2,35,318 ఎకరాల్లో సాగునీరు అందించడము జరుగుతుంది.

మహబూబ్ నగర్ జిల్లాలో ఈ ప్రాజెక్ట్ కింద ఆయకట్ కాలువల నిర్మాణానికి సుమారుగా 8,175 ఎకరాల భూమిని సేకరించడం జరుగుతుంది.

ఈ పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ పథకం నిధియోగములోకి వచ్చిన తరువాత రిజర్వాయర్లు, కెనాల్స్ ద్వారా మరియు భూనిధియోగం ద్వారా భూగర్భ జలం పెరుగుతుంది.అధనంగా సాగునీటి సామర్థ్యం ఈ ప్రదేశంలో పెరగుతుంది.ఆయకట్టు ప్రాంతంలోని రైతుల జీవన ప్రమాణాల్లో మెరుగుదల,స్థానికులకు ప్రాజక్టు పనులు మరియు సెకండరీ ద్వారా ఉద్యోగ,ఆర్థిక వ్యవస్థ, వాణిజ్యానికి ప్రయోజనాలు అందుబాటులో మెరుగైన మౌలికసదుపాయాలు ,నివేదం, పర్యాటక రంగానికి చేయూత,పశువుల పంపకానికి మరుగుని అవకాశాలు వుంటాయని ఆయన తెలియతేశారు

ఆయకట్టు కాలువల నిర్మాణానికి సంబంధించి పర్యావరణ అనుమతి అవసరము కావున పర్యావరణ ప్రభావిప్రాయ సేకరణ జరపవలసిన అవసరం వుంది, కావున ఈ ప్రాజక్ట్ మీద ప్రజలు తమ యొక్క అభిప్రాయాలు తెలుపవలసిందిగా కోరుచున్నాము.

శ్రీ. శ్రీ ఎస్. కృష్ణ మోహన్, ఎగ్జిక్యూటివ్ ఇంజనీర్, I & CADD., ఇరిగేషన్ డివిజన్ నం. 4, మహబూబ్ నగర్ ప్రాజక్టు గురించి ఈ క్రింది విధంగా వివరించారు.

- తెలంగాణ రాష్ట్రం భారతదేశం యొక్క దక్షిణ భాగంలో ఉంది, తెలంగాణ భారతదేశంలో 29 వ రాష్ట్రం, 2 జూన్ 2014 న 1,12,077 చదరపు. కి.మీ. విస్తీర్ణం తో ఏర్పడింది మరియు 35 మిలియన్లకు పైగా జనాభా ఉంది. అడవులు 24% విస్తీర్ణంలో ఉన్నాయి మరియు 43% భూమి సాగులో ఉంది.
- భూగర్భజలాలు 75% నీటిపారుదలకి దోహదం చేస్తాయి, అయితే నీటిపారుదలలో 25% మాత్రమే ఉపరితల నీటి సరఫరా ద్వారా మద్దతు ఇవ్వబడుతుంది.
- రాష్ట్రం యొక్క డ్రైనేజీని 2 ప్రధాన మరియు 11 ఉప-బేసిన్‌లుగా విభజించవచ్చు, గోదావరి మరియు కృష్ణా రాష్ట్రంలోని ప్రధాన నదులు, రాష్ట్ర భూభాగంలో దాదాపు 73.5% ఈ రెండు నదుల బేసిన్‌లో ఉన్నాయి అయితే, ప్రతిపాదిత నీటిపారుదల ప్రాజెక్ట్ కృష్ణా నది సరిహద్దుకు ప్రాంతాన్ని కవర్ చేస్తుంది.
- వ్యవసాయ-వాతావరణ మండలాల ప్రకారం, ఈ ప్రాంతం దక్షిణ పీఠభూమి మరియు కొండల ప్రాంతాల కిందకు వస్తుంది మరియు వేడి సెమీ-శుష్క పర్యావరణ ప్రాంతంగా వర్గీకరించబడింది.
- 2015-16 వ్యవసాయ గణాంకాలు సెల్లెండ్, మహబూబ్‌నగర్ మరియు రంగారెడ్డి జిల్లాలు తెలంగాణాలో కరువు బారిన పడుతున్నాయని సూచిస్తున్నాయి. ఇవి హైదరాబాద్ ప్రభావిత ప్రాంతాలు కాబట్టి రాగునీటికి విపరీతమైన కొరత ఉంది.
- ఈ బహిష్కరణ చక్రవిద్దడానికి, తెలంగాణ ప్రభుత్వం పాలమూరు - రంగారెడ్డి ఎత్తిపోతల పథకాన్ని చేపట్టింది.
- ఈ కరువు పీడిత ప్రాంతాల దుస్థితిని తొలగించడానికి ఈ ప్రాజెక్ట్ ద్వారా 6 జిల్లాల్లోని 70 మండలాలలు 1226 గ్రామాలతో పాటు 50 లక్షల మంది ప్రజలు సురక్షితమైన రాగునీటితో ప్రయోజనం పొందుతారు
- టర్మ్స్ ఆఫ్ రిఫరెన్స్ (TOR) నం. J-12011/31/2017-IA-I (R), తేదీ 11.10.2017 ద్వారా ఈ ప్రక్రియ ప్రారంభమైనది మరియు ఇది 10 అక్టోబర్, 2021 వరకు చెల్లుతుంది.
- ప్రభుత్వం PALIS, ఇరిగేషన్ మరియు CAD యొక్క ప్రాజెక్ట్ ప్రతిపాదకుడు. CE ద్వారా తెలంగాణ వేయాంస్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్, గురుగ్రామ్ కు ఆన్‌లైన్ టెండరింగ్ ప్రక్రియ ద్వారా EIA-EMP అధ్యయనాల పనిని అప్పగించింది .
- ముసుపటి బేస్‌లైన్ మానిటరింగ్ మాస్ జూన్, పోస్ట్ మాన్ సూన్, 2017 మరియు పోస్ట్-మాన్సూన్, 2018 లో నిర్వహించబడింది. ముసుపటి పబ్లిక్ హియరింగ్ 4 నుండి 17 జూన్, 2019 లో నిర్వహించటకు నిర్ణయించడమైనది కాని వాయిదా పడినది.
- EIA నోటిఫికేషన్‌కు 14 వ సెప్టెంబర్, 2006 కాలుష్య నియంత్రణ బోర్డుకు అనుబంధం - IV లోని పారా 7 (i) మరియు పారా 2.2 కింద నిబంధనలకు అనుగుణంగా ప్రాజెక్ట్ ప్రతిపాదకుడు, తెలంగాణ పొల్యూషన్ కంట్రోల్ బోర్డుకు ఎగ్జిక్యూటివ్ సారాంశంతో పాటు EIA-EMP ముసాయిదా నివేదికను సమర్పించారు.

- మళ్లీ బేసలైన్ మానిటరింగ్ ప్రక్రియ ప్రాజెక్ట్ ప్రభావం మరియు అధ్యయన ప్రాంతంలో మాన్ సూన్ మరియు మాన్ సూన్, 2019 మరియు ప్రీ-మాన్సూన్, 2020 లో నిర్వహించబడింది. పబ్లిక్ హియరింగ్ ప్రక్రియ 10 ఆగస్టు, 2021 న షెడ్యూల్ చేయబడింది.
- పాలమూరు లిఫ్ట్ ఇరిగేషన్ ప్రాజెక్టు అనేది 2 దశలలో విభజించబడినది దశ I: తాగునీటి సరఫరా.దశ II: నీటిపారుదల దని కోసము వర్షాకాలంలో వచ్చే వరద నీరు శ్రీశైలం రిజర్వాయర్ ముందు తిరాన్ని ఏర్పరుస్తుంది.
- ఈ ప్రాజెక్టు మహబూబ్ నగర్, నాగర్ కర్నూల్, నల్గొండ, నారాయణపేట, వికారాబాద్, రంగారెడ్డి జిల్లా మరియు హైదరాబాద్ నగరంలో చేయబడుతున్నది .
- ఇది 1226 గ్రామాలు, 70 మండలాలు 6 జిల్లాలలో (మహబూబ్ నగర్, నాగర్ కర్నూల్, నల్గొండ, నారాయణపేట, వికారాబాద్, రంగారెడ్డి): కమాండ్ విస్తీర్ణం: 4,97,976 హా.; పొడవు: 915.47 కి.మీ.నిర్మించడము జరుగుతుంది.
- దీని సరఫరా దశలు 6 అంజనగిరి, వీరాంజనేయ, వెంకటాద్రి, కురుమూర్తిరాయ, ఉదండాపూర్ మరియు లక్ష్మీదివిపల్లిలో బ్యాలెన్సింగ్ రిజర్వాయర్; 5 దశల ట్రైనింగ్ మరియు తరువాతి గురుత్వాకర్షణ ప్రవాహం ద్వారా విస్తీర్ణం.
- నీటి నిల్వ/సామర్థ్యం, 90 TMC (నీటిపారుదల కొరకు 82.52 TMC, తాగునీటి సరఫరా కోసం 7.15 TMC మరియు పారిశ్రామిక ఉపయోగం కోసం 0.33.ఈ ప్రాజెక్టు కోసము ప్రభుత్వము 57,056.31 కోట్లు: దశ II నీటిపారుదల ఎన: 35,200 కోట్లు కేటాయిస్తుంది
- . ఈ ప్రాజక్టు రెండో దశలో వెంకటాద్రి, కురుమూర్తిరాయ, ఉదండాపూర్, కె.పి లక్ష్మీదివిపల్లి రిజర్వాయర్లు ద్వారా 12,30,000 ఎకరాలకు సాగునీరు నీరందించేలా 13 ప్రధాన కాలువలు (మొత్తం పొడవు 915 కి.మీ) మరియు మొత్తము 11 గ్రామాలలో 7084 ఎకరాలు అయకట్టు చేస్తుంది అని అధికారులు తెలిపారు.

కన్సల్టెంట్ కుమారి సంపిత : పర్యావరణ సలహాదారు (గురుగ్రామ్, హర్యానా) ప్రైవేట్ లిమిటెడ్ ఈ ప్రాజెక్ట్ గురించి ఈ క్రింది విధంగా వివరించారు:

- బేస్ లైన్ ఎన్విరాన్మెంట్ డాటా ను MOEF మార్గదర్శకాల ప్రకారం TOR జారీ చేసిన విధంగా మహబూబ్ నగర్ జిల్లాలోని ఈ క్రింది 6 ప్రదేశాలలో హెచ్ఎండీఏ అధ్యయనము జరిగింది:

1) బోయిసిపల్లె గ్రామం 2) మునిమోకిలా గ్రామం, 3) మందనపురం గ్రామం 4) లందనాపి గూడూరు గ్రామం 5) మిడిపల్లె గ్రామం 6)మెంకెపల్లె గ్రామం.

బేస్ లైన్ మానిటరింగ్ మూడు సీజన్లలో అంటే, 2019 రుతుపవనాలు, రుతుపవనాల తర్వాత & 2020 రుతుపవనాలలో జరిగినది.

1. గాలి, నీరు (భూగర్భ జలాలు & ఉపరితలం రెండూ), మరియు నేల నందు పరామీటర్స్ లను అధ్యయనము చేయబడ్డాయి. అన్ని విలువలు అనుమతించదగిన పరిమితుల్లో ఉన్నాయని తెలిపారు
2. పగలు మరియు రాత్రి సమయ శబ్దం స్థాయిలు నిర్దేశిత పరిమితుల్లో ఉన్నాయని శబ్ద పర్యవేక్షణ చూపుతుంది.
3. గాలిలో కలుషితాల ఏకాగ్రత అనుమతించదగిన పరిమితి కంటే తక్కువగా ఉంది (PM10: 18.3-49.3 /g/m3; PM2.5: 9.9-26.9 /g/m3.
4. ఆరు ప్రదేశాలలో నిర్వహించబడిన అన్ని పరామెటర్స అనుమతించదగిన పరిమితిలో మాత్రమే కనుగొనబడ్డాయి.
5. భూగర్భ జలాల నీటి యొక్క TDS స్థాయి రుతుపవనాలలో 151mg/l మరియు రుతుపవనాల తర్వాత 248 mg/l మధ్య ఉంది.

పర్యావరణ ప్రభావాలు మరియు ఉపశమన చర్యలు:

సూక్ష్మ వాతావరణం: నిర్మాణ దశ. నిర్మాణ పనుల కారణంగా ఉద్గారాలు మరియు తేమపై స్వల్పకాలిక ప్రభావం;ఆపరేషన్ దశ: ప్రభావం లేదు. తీవ్రతను తగ్గించడం: పర్యావరణ నిర్వహణ ప్రణాళిక (EMP) లో సూచించిన విధంగా నియంత్రిత నిర్మాణ ప్రక్రియ

భూమి వినియోగం: వ్యవసాయ/వ్యవసాయేతర భూమి శాశ్వతంగా నాన్ ఏజీ లేదా చదును చేయబడిన ప్రాంతంగా మార్చబడుతుంది తీవ్రతను తగ్గించడం: EMP ద్వారా మెరుగుపరచబడిన మరియు ప్రణాళికాబద్ధమైన భూ వినియోగ అభివృద్ధి

నేల నాణ్యత. నిర్మాణ దశ: పేలుడు, తవ్వకం వంటి కారణంగా నేల కోతపై మధ్యస్థ ప్రభావం

ఆపరేషన్ దశ: పెద్ద ప్రభావం లేదు. తీవ్రతను తగ్గించడం: నియంత్రిత బ్లాస్టింగ్: వర్షాకాలంలో పేలుడు చేయదు,

నాలి పర్యావరణం: నిర్మాణ దశ- మధ్యస్థ-అధిక దుమ్ము కాలుష్యం: ఆపరేషన్ దశ: పెద్ద ప్రభావం లేదు. తీవ్రతను తగ్గించడం: క్రమం తప్పకుండా నిర్వహణ మరియు కాలుష్య పర్యవేక్షణతో నియంత్రిత ఆపరేషన్

శబ్దం వాతావరణం: నిర్మాణ దశ: మధ్యస్థ అధిక ధ్వని కాలుష్యం: ఆపరేషన్ దశ: పెద్ద ప్రభావం లేదు తీవ్రతను తగ్గించడం ప్లాంటేషన్ మరియు శబ్ద శబ్దం అవరోధం.

బ్లాస్టింగ్ వల్ల ప్రభావాలు: పేలుడు కారణంగా పీడనంపై అంచనా వేసిన నాలి వద్దగా 103.2 -109.8 dB (A) మధ్య ఉంటుంది మరియు 120 dB (A) కంటే తక్కువగా ఉంటుంది. తీవ్రతను తగ్గించడం: బొగోలిక ప్రణాళిక ప్రకారం నియంత్రిత మరియు ప్రణాళికాబద్ధమైన బ్లాస్టింగ్ చేయాలి.

నీటి వాతావరణం: నిర్మాణము జరిగే సమయములోనది నీటిలో ఘన మరియు సిల్ట్ ఏకాగ్రత పెరుగుదల వుందని ఆపరేషన్ సమయంలో. ప్రమాదవశాత్తు నీటి లాగింగ్ యొక్క ప్రభావాలు సంభవించవచ్చు. తీవ్రతను తగ్గించడం: కాలువ వ్యవస్థలో నియంత్రిత తవ్వకం. వర్షాకాలంలో తవ్వకాలు పరిమితం చేయబడ్డాయి.

భూగర్భ కాస్తం: నిర్మాణము జరిగే సమయములో స్థానికీకరించిన మరియు తక్కువ ప్రభావాలు అంచనా వేయబడ్డాయి. **తీవ్రతను తగ్గించడం:**ప్రాంతం యొక్క బొగోలిక స్థితి ప్రకారం నియంత్రిత మరియు ప్రణాళికాబద్ధమైన బ్లాస్టింగ్ జరపాలి

హైడ్రాలజీ: ప్రతిపాదిత నికర భూగర్భ బలాల రీచార్జ్ 970.24 MCM. **తీవ్రతను తగ్గించడం:** కాలువలలో ప్రమాదవశాత్తు డిశ్చార్జ్‌లో అనియంత్రిత సీపేజ్ మరియు పర్యవేక్షణ కోసం EMP ని అనుసరించాలి.

వృక్షజాలం: హాని కలిగించే లేదా అంతరించిపోతున్న జాతులు ప్రభావితం కావు. **తీవ్రతను తగ్గించడం: మొత్తం కాలువ నెట్‌వర్క్ యొక్క రిమ్ ప్రాంతంలో ప్లాంటేషన్. అటవీ ప్రాంతాల్లో భిబిరాల ఏర్పాటు కోసం పరిహార అడవుల పెంపకం.**

జంతుజాలం. అంతరించిపోతున్న మరియు ప్రమాదంలో ఉన్న జాతుల స్వస్థల ఆవాసాలకు ఎలాంటి మార్పు లేదు. **తీవ్రతను తగ్గించడం: ఈటవీ నిర్మాణం సమీపంలో నియంత్రిత నిర్మాణం చేపట్టాలి.**

సామాజిక-ఆర్థిక పరిస్థితి: సాధారణ నీటి సరఫరాతో పేలిపోరుదల మరియు పంట అలివృద్ధిలో మిరుగుదల. తీవ్రతను తగ్గించడం: సానుకూల ప్రభావాలు. ప్రాజెక్ట్ ప్రాంతం యొక్క సామాజిక ఆర్థిక స్థితిని మెరుగుపరుస్తుంది.

పర్యావరణ నిర్వహణ ప్రణాళిక, పునర్వ్యవస్థీకరణ కోసము అనగా క్యాచ్మెంట్ ఏరియా ట్రీట్మెంట్ ప్లాన్, కమాండ్ ఏరియా డెవలపమెంట్ ప్లాన్, పరిహార అడవుల పెంపకం పథకం, వన్యప్రాణి మరియు జీవ వైవిధ్య నిర్వహణ ప్రణాళిక, మత్స్య నిర్వహణ ప్రణాళిక, పునరావాసం & పునరావాస ప్రణాళిక, పునరావాసం & పునరావాస ప్రణాళిక, పునరావాసం & పునరావాస ప్రణాళిక, గ్రీన్ బెల్ట్ అభివృద్ధి ప్రణాళిక, రిజర్వాయర్ రిమ్ ట్రీట్మెంట్ ప్లాన్, యుక్ మేనేజ్‌మెంట్ ప్లాన్, ప్రకృతి దృశ్యం మరియు పునరుద్ధరణ ప్రణాళిక, క్వారీ సైట్‌ల పునరుద్ధరణ ప్రణాళిక, విపత్తు నిర్వహణ ప్రణాళిక, నీరు, నాలి మరియు శబ్దం నిర్వహణ ప్రణాళిక, పబ్లిక్ హెల్త్ డెలివరీ ప్లాన్, కార్మిక నిర్వహణ ప్రణాళిక, పారిశుద్ధ్యం మరియు ఘన వ్యర్థాల నిర్వహణ ప్రణాళిక, స్థానిక ప్రాంత నిర్వహణ ప్రణాళిక, రహదారి నిర్మాణంతో సహా నిర్మాణ కార్యకలాపాల సమయంలో పర్యావరణ భద్రతలు. ఈక్ సుదీర్ఘణ చర్యలు, పర్యావరణ పర్యవేక్షణ ప్రణాళిక కోసము 174,400 లక్షలు కేటాయించినట్లు తెలిపారు

మరియు పునరావాస సూత్రాలు ధ్వజం కింద సేకరించిన భూమికి సంబంధించి పరిహారం ఎక్కేజీ యొక్క బాగం భూమి మార్కెట్ విలువ. గ్రామీణ ప్రాంతాల విషయంలో మార్కెట్ విలువను గుణించాల్సిన అంశం, పట్టణ ప్రాంతాల విషయంలో మార్కెట్ విలువను గుణించాల్సిన అంశం, సొలాటియం .గ్రామీణ ప్రాంతాల్లో అది పురస్కారం. పట్టణ ప్రాంతాల్లో తుది

పురస్కారము గురించి వివరములు తెలిపారు. పట్టా భూములు ప్రధాన కాలువ కోసము మహబూబ్‌నగర్ రైతుల నుండి 1681 Ha, మరియు చిన్న కాలువల కోసము 1750 ha మొత్తము 3431 Ha తీసుకున్నారని తెలిపారు.

ప్రాజక్ట్ ప్రయోజనం

- ప్రాజెక్ట్ 4,97,976 హెక్టార్లకు సాగునీరు అందిస్తుంది. తెలంగాణ రాష్ట్రంలోని 6 జిల్లాల్లోని 1226 గ్రామాలు, 70 మండలాల్లోని భూములు.
- ఈ ప్రాజెక్ట్ 6 జిల్లాలకు మరియు హైదరాబాద్ నగరంలో కూడా సురక్షితమైన తాగునీటిని అందిస్తుంది.
- కనీసం 50 లక్షల మంది ప్రజలు తమ సాగు ప్రక్రియకు సురక్షితమైన తాగునీరు మరియు నిరంతరాయ నీటిపారుదల నీటితో ప్రయోజనం పొందుతారు.
- రబీ మరియు ఖరీఫ్ సాగు ప్రక్రియ మెరుగుపడుతుంది మరియు ఉత్పాదకత మెరుగుపడుతుంది, ఎందుకంటే ప్రాజెక్ట్ ప్రభావిత ప్రాంతం కరువు కారణంగా ప్రభావితం కాదు.పాలమూరు - రంగారెడ్డి ఎత్తిపోతల పథకం నిర్మాణ ప్రక్రియలో కనీసం 7000 ఉద్యోగాల కల్పన జరుగుతుంది. ప్రాజెక్ట్ నిర్మాణం మరియు ఆపరేషన్ సమయంలో పరోక్ష ఉద్యోగ ఉత్పత్తి కూడా కనిపిస్తుంది

మైన పేర్కొన్న ప్రాజెక్టు వివరములను శ్రీ ఎస్. కృష్ణ మోహన్, ఎగ్జిక్యూటివ్ ఇంజనీర్, I & CAOD , ఇరిగేషన్ డివిజన్ నం. 4, మహబూబ్ నగర్ వారు తెలుగు లో వివరించడము జరిగినది

జిల్లా కలెక్టర్, మహబూబ్ నగర్ కన్సల్టెన్సీ, సూపరింటెండింగ్ ఇంజనీర్, ఇరిగేషన్ సర్కిల్ No.1, మహబూబ్‌నగర్ ప్రాజక్టు పై ఇంత వివరముగా తెలుగు మరియు ఇంగ్లీషులో వివరించినందుకు కృతజ్ఞతలు తెలిపారు.కన్సల్టెన్సీ వారు 20'9 2020 సర్వే చేసి చక్కటి నివేదికను సమర్పించినందుకు అభినందించారు. వారు చేసిన ఈ అధ్యాన్ని పుస్తక రూపములో ప్రచురించి అందరికీ ఇవ్వాలని తెలియజేశారు. ప్రజలు పర్యావరణ ప్రజాభిప్రాయసేకరణ సందర్భంచిన తమ అభ్యంతరాలు /సలహాలను తెలుపాలని కోరారు .

ఈ కింది వ్యక్తులు తమ అభిప్రాయాలను మరియు ప్రశ్నలను ఈ క్రింది విధంగా వ్యక్తం చేశారు:

1. శ్రీ వెంకట రామి రెడ్డి R/o. కోనాపూర్ పల్లి (గ్రామం), హవ్వాడ (M):

చాలా కాలముగా పాలమూరు జిల్లా లేబర్ జిల్లా గా పేరు గాంచినది.పర్యావరణ ప్రజాభిప్రాయం నిర్వహించడం పట్ల ఆయన సంతోషం వ్యక్తం చేశారు. కృష్ణ నది మహబూబ్‌నగర్ జిల్లాకు బాహుపు 300 టెలోమీటర్ల వరకు ప్రవహిస్తుందని, అయిన కూడా జిల్లాలో అనేక మంది ప్రజలు పని కోసం దెశంలొని వివిధ ప్రాంతాలకు చలస వెళుతున్నారని ఆయన అన్నారు.ఈ ప్రాజక్టు వల్ల రైతులు మరియు వారి పిల్లలు చాలా లాభాలను పొందుతారని ఆయన తెలిపాడు.ప్రాజెక్ట్ పూర్తయిన తర్వాత ప్రజలు తిరిగి మరల వలస వస్తారని అతను అశను వ్యక్తం చేశాడు. ఈ ప్రాజెక్టు వల్ల పరిశ్రమ కూడా పెరుగుతుందని దినివల్ల ఉద్యోగ అవకాశాలు పెరుగుతాయని ఆయన తెలిపాడు. పూర్వము ఇరు నీటి కోసము చాలా ఇబ్బందులు ఎదుర్కున్నామని కాని అతను మిషన భగీరథ వల్ల ఆ బాధ లేదని అలాగే పాలమూరు-రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీమ్ యొక్క ఫేజ్ -2 లో ని నీరు, చట్టా సాగునీటి కోసం ఉపయోగపడుతుందని చలితంగా జిల్లా అభివృద్ధి చందుతుందని వ్యక్తం చేశారు.ఈ ప్రాజెక్టు పని పూర్తి అయిన తరువాత మహబూబ్ నగర్ జిల్లా కూడా ఉమ్మడి గోదావరి జిల్లా ల సస్యశ్యామలంగా మారుతుందని ఆయన తెలిపారు పాలమూరు,హైదరాబాద్ కు దగ్గర వున్న కూడా అంతగా అభివృద్ధి చెందలేదని ఈ ప్రాజెక్టు వల్ల అభివృద్ధి రావచ్చని ఆయన తెలిపారు. ఈ ప్రాజెక్టు వల్ల ఎటువంటి పర్యావరణ నష్టము లేదు కాబట్టి తాను ఈ ప్రాజక్టు కావాలని తెలిపారు.

చాలా విలువైన సమాచారములను తెలియజేసినందుకు జిల్లా కలక్టర్ & చుజస్టెట్ మహబూబ్ నగర్ అతనికి కృతజ్ఞతలు తెలిపారు మరియు వారు చెప్పిన సూచనలని తప్పక నమోదు చేసుకుంటామని తెలిపారు.

2. శ్రీ బి . నాగన్న , రాష్ట్ర కార్యదర్శి , సిటియుసి , హన్వాడ :

పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ పదకం ద్వారా కరువు పీడిత బిల్లాను వ్యవసాయపరంగా అభివృద్ధి చెందిన జిల్లాగా అభివృద్ధి చేయడం పట్ల ఆయన సంతోషం వ్యక్తం చేశారు. ఈ ప్రాజక్టు వల్ల 6 జిల్లాలు,14 మండలాలు,24' గ్రామ పంచాయితుల ప్రజలు దాహా బంతోషంగా వుంటారు అని ఆయన తెలియజేశారు ఇంకా , భూ సేకరణ ప్రక్రియలో ఎన్ని మరియు సన్నకారు రైతులకు చెల్లించాల్సిన సరిహద్దు వివరాలను FMP లో పేర్కొనాలని ఆయన తెలియాజేశారు. ఈ **ప్రాజెక్టు వల్ల జిల్లా చాలా అభివృద్ధి చెయ్యవుందని కాబట్టి ఈ ప్రాజెక్టు ను ఆయన స్వాగతించినట్లు తెలిఎరు.**

ఏడ ప్రజల గురించి ఈ ఆవేదనని తెలిపినందుకు మరియు ప్రాజెక్టు కు సందంధించి వివరాలు తెలియజేసినందుకు జిల్లా కలక్టర్ గారు ఆతనికి కృతజ్ఞతలు తెలిపారు

3. శ్రీ కొండ లక్ష్మయ్య a h R/o హన్వాడ :

ఈ ప్రాజెక్టు 20 సంవత్సరాల తమ కల అని తెలియజేశారు ఇంతంత వర్షపాతం లేనందున చాలా మంది ప్రజలు పనుల కోసం వివిధ ప్రాంతాలకు ఎ..ఇ. పూణే, ముంబై వలస వెళ్తున్నారని ఆయన పేర్కొన్నారు ఈ ప్రాజెక్టు వల్ల వారి దారిద్ర్యాన్ని తొలగించగలవని ఆయన తెలిపాడు . కాలువ గమనాన్ని చూపించే మ్యాప్, సహజ వనరులు గ్రామాల వివరాలు మరియు మండలాల వివరాలను అందించాలని ఆయన తెలిపారు చిన్న మరియు సన్నకారు భూములకు ప్రస్తుత మార్కెట్ ధరతో సమానమైన పరిహారాన్ని అందించాలని ఆయన కోరారు ఇంద్ర రాష్ట్రములో 1 ఏకరము భూమి వున్న కూడా రైతు ఆనందముగా వుంటాడని కాని ఇక్కడ 10 ఏకరము వున్న రైతు భూములను పండించుకోలేక బాధ పడుతున్నాడాని ఆయన తెలిపారు.కాని 35 గ్రాము పంచాయితీలలో కేవలం 9 గ్రాము పంచాయితీలు మాత్రమే లబ్ధి పొందాయని అందుచేత నివేదికలో పేర్కొన్నాయని అయన ప్రశ్నించారు మరియు ప్రత్యామ్నాయ నీటిపారుదల ఏర్పాటుల ద్వారా లబ్ధి పొందడానికి హన్వాడ మండలంలోని అన్ని గ్రామాలను కవర్ చేయాలని అభ్యర్థించారు.

జిల్లా కలక్టర్ మహబూబ్‌నగర్ సంబంధిత అధికారుల ద్వారా ఆయన కోరిన విధంగా మ్యాపును అందిస్తామని తెలిపారు మరియు ప్రాజక్టు కు సంబంధించిన పూర్తి మ్యాప్ ని ఎరిగేషన్ వారి దగ్గర నుండి పొందవచ్చని ఆయన తెలిపారు .

4. పి.రామ్ రెడ్డి, ఉపాధ్యక్షుడు, తెలంగాణ రబ్బర్ ఇండస్ట్రీస్ అసోసియేషన్ :

పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీమ్ యొక్క ప్రతిపాదిత ప్రాజెక్టును ప్రతిపాదించినందుకు ఆయన ప్రభుత్వానికి కృతజ్ఞతలు తెలిపారు. ఈ ప్రాజక్టు వల్ల వలస వెళ్ళిన వారు తిరిగి వస్తారని అనుకుంటున్నట్లు ఆయన తెలిపారు. కన్సల్టెంట్ అధ్యయనం ప్రకారం ప్రాజక్టు నిర్మాణంలో ఎలాంటి పర్యావరణ సమస్యలు తలెత్తవని ,భూమి మరియు వాయు కలుషితము కూడా జరగడము లేదని ఆయన పేర్కొన్నాడు మరియు ఈ ప్రాజక్టు వల్ల కలిగే అనుకూల తో పోలిస్తే ప్రతికూలతలు చాలా తక్కువ అని ఆయన తెలియజేశారు.

ప్రజలకు,ప్రభుత్వానికి అందించిన వారి సేవలను అభినందిస్తూ ,కన్సల్టెన్సీ వారు చెప్పిన విదముగా పర్యావరణానికి ఎలాంటి హాని లేదు అని తెలియజేయడము మాకెంతో ఆనందముగా వుందని జిల్లా కలక్టర్ గారు తెలియాజేశారు.

5. టి. వెంకటేశం , ఛైర్మన్, తెలంగాణ ఇంజనీర్స్ ఇవిసి:

ఆయన ప్రాజెక్టు కృష్ణ నది మీదుగా కట్టి జూరాల నుండి ప్రవహించి చివరకు బంగాళా ఖాతములో కలుస్తుందని తెలిపారు. మహబూబ్ నగర్ జిల్లా గుండా ఈ ప్రాజక్టు 300 కి. మీ. ప్రవహిస్తుందని అయిన కూడా ఈ జిల్లా లలో నీటి ఇబ్బందులు ఎక్కువగా వున్నాయని ,చెరువు నీటి సామర్థ్యత కూడా చాల తక్కువ అని ఆయన తెలియజేశారు .తెలంగాణ కోసము 6 పిండ్ల పోరాటము చేసిన కూడా ఈ రోజు నీటి కోసము ఇంత ఇబ్బందులు ఎదురుకోవలసి వస్తుందని ఆయన తెలిపారు అతను స్టేజ్ I మరియు స్టేజ్ II లో ప్రాజెక్ట్ గురించి వివరణాత్మక వాస్తవాలను రైతులకు మరియు ప్రజలకు వివరించాడు మరియు40 లక్షల ప్రజలకు ఈ ప్రాజెక్టు వల్ల లాభము కలుగుతుందని తెలిపారు . ఈ ప్రాజెక్టు కోసము ఎస్. జి. టి. ఆదేశాల ప్రకారము కన్సల్టెన్సీ ద్వారా పర్యావరణ అధ్యయనము జరిపించి ,సర్వానాశనానికి ఎటువంటి ఇబ్బంది లేదని

తెలిఖాకె ఒక న్యాయ పరమై ని విద్దతిలో ఈ పర్యావరణ సమావిశమును ఏర్పాటు చేసినట్టు తలిపాడు నలగలకు వెళ్ళిన ప్రజలు జిల్లారు తిరిగి మరల వలస పస్తారని ఆయన ఆశిస్తు ఈ ప్రాజక్టు పనులను రాత్రి పగలు కష్ట పది అయిన పూర్తి చేయాలని కోరాడు .

ప్రాజక్టు తు సంబందించి దాలా విలువైన వివరములను తెలియజేసినయుందుకు జిల్లా కలక్టర్ గారు కృతజ్ఞతలు తెలిపాడు మరియు వలస వెళ్ళిన వారు కూడా తిరిగి వస్తున్నారని ఆయన పర్కొన్నారు

6. శ్రీ శ్రీనివాస రెడ్డి, ZPTC, గండీడ :

ఉమ్మడి ఆంధ్రప్రదేశ్ కాల్లంలో రాజకీయ నాయకులు సుమారు 60 సంవత్సరాలు పాటు పాలించారని, ఇలాంటి పర్యావరణ ప్రభావిస్తాయాలు జరగలేదని ఇప్పుడు నిర్వహించడానికి తన సంతోషాన్ని వ్యక్తం చెశారు. కొత్తకోట మరియు పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ పథకాలను చేపట్టినందుకు ప్రభుత్వాన్ని అభినందించాలని ఆయన తలియజెశాడు. ఈ పథకాన్ని తొందరగా పూర్తి చసి నీటి బకాయిన్ని ప్రజలకు తొందరగా అందించాలని తెలియజెశారు

7. కరుణాకర్ గౌడ్ , TRS సభ్యుడు:

ఈ ప్రాజెక్టును చేపట్టడానికి ఎలాంటి అభ్యంతరం వ్యక్తం చెయలెదు. తను ఊరికి నీరు వస్తుందని ఆయన అనుకోలేదని,కానీ ఇప్పుడు నీరు 110 కి. మీ ప్రవహించి తమ ప్రాంతానికి రావడము దాలా ఆనందముగా వుందని ఆయన తెలియజేశారు 23 సంవత్సరాల నుండి మండల వర్షపాతం దాలా తక్కువగా వుందని చుడియు దాలా మంది ప్రజలు పని కోసం వివిధ ప్రాంతాలకు వలస వెళ్లారని తెలిపారు .మరియు తగినంత వర్షపాతం కారణంగా 2 సంవత్సరాల నుండి ప్రజలు తిరిగి రానడం ప్రారంభమైందని ఆయన పేర్కొన్నారు. ఇలాంటి సమయంలో నీళ్లు తొందరగా రావాలని ఆశించినట్లు పేర్కొన్నారు.ఈ నీటిని వారు దాలా సమర్థవంతముగా ఉపయోగిస్తామని తెలిపారు. ప్రాజెక్ట్ యొక్క వివరణాత్మక నివేదిక కోసం అడ్గినిందారు మరియు బహిరంగ విచారణను ఏర్పాటు చేసినందుకు ధన్యవాదాలు తలిపారు

తమ ఊరి గురించి తెలియని దాలా విషయములు తెలిపినందుకు మరియు విలువైన సమాచారమును తెలియజేసినందుకు కలెక్టర్ గారు కృతజ్ఞతలు తలిపారు.

8. వేపూరి యాది రెడ్డి, కాంగ్రెస్ పార్టీ సభ్యుడు:

పాలమూరు-రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ పథకం చిరకాల స్వప్నమని. ఇది ఇప్పుడు ముందలానికి రావడం అధ్యకారణంగా మారిందని ఆయన పేర్కొన్నారు.

చిన్న మరియు సన్నకారు రైతుల ద్వారా మా సికరణకు సంబంధించిన పరిహారం దాలా తక్కువగా వుందని మరియు రూ .30.00 లక్షల నుండి రూ. ఎకరాకు 50.00 లక్షలు లేదా వారికి ప్రభుత్వ ఉద్యోగం అందిదాలని రైతులు అడుకున్న తక్కువ పరిహారం వారికి విద్దగా సహాయపడదని ఆయన అన్నారు. దాలా మంది ప్రజలు చిన్న మరియు సన్నకారు రైతులు కనుక వారికి న్యాయం చేయాలని పేర్కొన్నారు రాలువ వెళ్లి వివరాలను (సర్వె నంబరి వారిగా, రైతు వివరాలు, సేకరించిన భూమి విస్తీర్ణం) చూపించే మ్యాప్‌ను ఏర్పాటు చేయాలని ఆయన అద్యర్థించారు.

జిల్లా కలక్టర్, మహబూబ్‌నగర్, సూచనలను రికార్డు చేసుకున్నట్లు తలిపారు మరియు జిల్లా కలక్టర్ గా ఇప్పటి నుండి భూములను ఏ ప్రాజెక్టు కోసము అయిన సేకరించేటప్పుడు ముందస్తుగా ధ్రష్ట నోటిఫికేషన్ ఇచ్చి రైతుల వివరములు మరియు వారి అభ్యంతరములను సెకరించిన తరువత ఏ పూర్తి నోటిఫికేషన్ విడుదల చస్తామని బోసా ను ప్రభుత్వ అధికారుల సమక్షములో ఉన్నట్లు తెలియజేసారు .పర్యావరణ సమస్యలపై మార్గమి తలియ చేయాలని ప్రజలను అభ్యర్థించారు.

9. శ్రీ వి. నారాయణ్ గౌడ్ , ఎగ్జిక్యూటివ్ ఇంజనీర్ (రిటైర్డ్):

జిల్లాలో 90 టిఎంసీల నీటిని ఎత్తిపోసే ప్రాజక్ట్ ప్రతిపాదన పట్ల ఆయన సంతోషం వ్యక్తం చేశారు. అతను ప్రాజెక్ట్ యొక్క ప్రతిపాదిత వాస్తవాలు మరియు గణాంకాలను ప్రాతిక్షుపై అధ్యయనం చేసిన గురుగ్రామ్‌లోని వేయంట్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్‌ని కన్సల్టెంట్ ని అభినందించారు. తెలియజేశారు. సిటిపాడుదల మరియు పారిశ్రామిక ఎదుకానికి సహాయపడే ప్రాజెక్టును త్వరగా పూర్తి చేయాలని ఆయన ఆకాంక్షించారు

స్మారక మరియు వన్యప్రాణుల సమ్మం గమనించబడలేదని మరియు భూగర్భ జల మట్టాల పెరుగుదల ధృవీకరించని మరియు ప్రాజెక్ట్ యొక్క ఆమోదం తొందరగా రావాలని తన ఆశను వ్యక్తం చేసారు మరియు ప్రాజెక్ట్ పూర్తయిన తర్వాత 50.00 లక్షల మందికి ప్రగా సురక్షితమైన తాగునీరు అందుబాటులో ఉంటుందని పేర్కొన్నారు.ఈ ప్రాజెక్టు వల్ల బాలా రైతులు లబ్ధి పడతారని ,కానీ కొంత మంది ఎవరైతే భూములను ఇచ్చారో వారికి భూమి పుండొచ్చు అని వారికి ప్రభుత్వము నుండి తగినంత న్యాయము చేయాలని ఆయన తెలియజేశారు

చాలా ముక్యమైన రెండు విషయములను ను ,భూగర్భ జలాలు పెరగడము మరియు 50 లక్షల మందికి త్రాగు నీటి సదుపాయము కలిగించడము వంటి వాటిని తెలిపినందుకు జిల్లా కలక్టర్ గారు ఆయనను అభినందించారు ,

10. శ్రీ మట్టగుర్ల వెంకటయ్య :

ఈ ప్రాజెక్ట్ వల్ల మహాబూబ్ నగర్ జిల్లాలో ఎలను వెళ్ళిన వారు తిరిగి వచ్చేలా చేయగలదని తెలిపారు. ఈ ప్రాజెక్ట్ ద్వారా రైతుల సంక్షేమం కోసం ఆశిస్తున్నట్లు ఆయన పేర్కొన్నారు. ప్రాజెక్ట్ నిర్మాణ ప్రక్రియలో, రైతుల హక్కులను కాపాడాలని కూడా ఆయన పేర్కొన్నారు. ప్రాజెక్టు పనులు జరిగే సమాయములో తగిన జాగ్రత్తలు తీసుకోవాలని ఆయన తెలిపారు.కాలువ గమనాన్ని చూపించే మ్యాప్‌ని అభ్యర్థించి పర్యావరణ ప్రభావస్థాయం గురించి సమాచారం లేకపోవడం వల్ల బాలా చింది ఈ సమావేశంలో భాగం కాలేదని పేర్కొన్నాడు.

ఈ పర్యావరణ ప్రజాభిప్రాయ సేకరణ కు సంబంధించి ఒక నెల ముందుగానే రెండు దినపత్రికలలో తెలుగు నమస్తే తెలంగాణ మరియు ఇంగ్లీషు ది హిందు పత్రికలలో ప్రచురించబడ్డాయని మరియు గ్రామ పంచాయితీలలో దండోరా కూడా వేయించారని ఆయన తెలిపారు. వీటికి సంబంధించిన లెటర్స్ ,emp మరియు ఎగ్జిక్యూటివ్ సారాంశాలను గ్రామ పంచాయితీలలో అందించినట్లు ఆయన పేర్కొన్నారు

అదనపు కలెక్టర్, శ్రీ కె. సీతా రామారావుకు ఎన్‌బిఓ ల నుండి రెండు ప్రాతిపూర్వక సూచనలు అని కాలువకు ఇరువైపులా మొక్కలను పెంచడం మరియు పండ్ల మొక్కలను నాటాలని ,కాలువలో పశువులు నీటిని సులభంగా త్రాగడానికి మెట్ల నిర్మాణము చేయాలని సూచించారు

11. శ్రీ జైపాల్ రెడ్డి, రైతు, భూత్పూర్ మండలం కొత్తూరు గ్రామం :

కవ్వన విద్యార్థుల కోసం తన 25 ఎకరాల భూమిని కోల్పోయినందుకు తన బాధను వ్యక్తం చేశాడు మరియు భూములు కోల్పోతున్న ప్రతి కుటుంబానికి ప్రభుత్వ ఉద్యోగం కల్పిస్తామని గౌరవ ముఖ్యమంత్రి హామీ ఇచ్చారని , ఆయితే ఇప్పటివరకు ఉద్యోగం కల్పించలేదని ఆయన పేర్కొన్నారు ఉద్యోగాలు కల్పించిన తరువాత నే ప్రాజెక్టు పనులను పూర్తి చేయాలని ఆయన అభ్యర్థించారు.

మహబూబ్‌నగర్ జిల్లా కలెక్టర్ అతనిని జిల్లా కలెక్టర్ కార్యాలయంలో కలవాలని, తద్వారా తనకు తగినంత సహాయము చేస్తానని హామీ ఇచ్చారు .

12. శ్రీ ఆంజనేయులు , మాజీ మార్కెట్ కమిటీ చైర్మన్

ఈ ప్రాజెక్ట్ ప్రజలకు చాలా ఉపయోగకరంగా ఉంటుందని ఆయన పేర్కొన్నారు. పూర్వ మహబూబ్‌నగర్ జిల్లా కరువు పరిస్థితిని వివరించారు. ఈ ప్రాంతములో అధ్యయము జరిపి ,పర్యావరణకి ఎలాంటి ఇబ్బంది లేదని తెలిపిన వేయంట్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్ కన్సల్టెన్సీ వారిని ఆయన అభినందించారు. మహబూబ్ నగర్ లో కరువు పరిస్థితి గురించి ఆయన 2 పాఠాలా రూపములో వివరించారు జిల్లా నుండి కరువును నియంత్రించడంలో పాలమూరు-రంగారెడ్డి లిఫ్ట్

ఇరిగేషన్ స్కీము ఉపయోగపడుతుందని ఆయన అభిప్రాయపడ్డారు మరియు ఈ ప్రాజెక్టును స్వాగతిస్తున్నట్లు పేర్కొన్నారు.

13. శ్రీ మల్లు సర్పంపా రెడ్డి, R/o. రామచంద్రపూర్ గ్రామం మహబూబ్ నగర్ మండలం :
పాలమూరు-రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ పథకం 75 సంవత్సరాల స్వాతంత్ర్యం తర్వాత వెలువడిన కల అని ఆయన పేర్కొన్నారు. 34 సం. ల రైతుగా వున్న తనకు తనకు భూగర్భ జలాలు క్షీణించడం గురించి తెలుసునని ఆయన పేర్కొన్నారు.1992 నుండి ఆయన 24 బోర్ వెల్ లు వేస్తే వాటిలోని కేవలము 8 బోరెవెల్ లలో మాత్రమే నీరు వుందని ఆయన ఆవేదనని వ్యక్తము చేశారు .ఈ ప్రాజెక్టు వల్ల బోర్ నీటి అవసరము కూడా వుండదని చిన్న కారు రైతులు కూడా దీని వల్ల చాలా సంతోషంగా వుంటారని ఆయన తెలియజేశారు. ప్రాజెక్ట్ అంతటా పచ్చదనం పెంచాలని పేర్కొన్నారు మరియు వలస వెళ్ళినవారు తిరిగి రావాలని ఆశించినట్లు తెలిపారు మరియు ప్రాజక్ట్ యొక్క ముందస్తు ఆమోదం కోసం ఆయన అభ్యర్థించారు.

బోర్ వెల్ నీటి గురించి తనకు వున్న అనుభవాలను మరియు చాలా మంచి అంశాలను తెలియజేసినందుకు జిల్లా కలెక్టర్ గారు ఆయనకి కృతజ్ఞతలు తెలిపారు .

14. శ్రీ మల్లు దేవేందర్ రెడ్డి, అభ్యుదయ, రైతు బంధు , మహబూబ్ నగర్ మండలం :
మహబూబ్ నగర్ లోని ప్రజలు రోజువారీ కార్మికుడిగా కేవలము రూ. 350 వేతనంతో పనిచేశాడని మరియు అతను రూడా ఆంధ్రప్రదేశ్ కి వలస వెళ్లి. ప్రింటింగ్ ప్రెస్‌లో పనిచేశారని పేర్కొన్నారు. ఇప్పుడు ఈ ప్రాజక్ట్ పూర్తయిన తర్వాత వలస వెళ్ళినవారు తిరిగ వస్తారని తన ఆశను వ్యక్తం చేశాడు. ప్రాజెక్ట్ కోసం బహిరంగ విచారణ చెయ్యడం చాలా సంతోషం అని అతను అన్నాడు.ఇంకా, ప్రభుత్వం తాగునీటి కోసం మిషన్ భగీరథ, మిషన్ కాకతీయ వంటి అనేక ప్రాజెక్టులను అభివృద్ధి చేసిందని మరియు ఈ ప్రాజెక్ట్ నుండి చాలా మంది రైతులు ఎక్కువ ప్రయోజనాలను పొందుతున్నారని పేర్కొన్నారు. ఈ ప్రాజెక్ట్ వల్ల చుట్టూ ప్రక్క భూమి విలువ ఎకరానికి 50 లక్షలు పెరుగుతుందని తెలిపారు. ఈ ప్రాజక్టు కోసము తమ భూములను కోల్పోయిన వారి కోసము ప్రభుత్వము తగిన న్యాయము చేయాలని అభ్యర్థించారు.

జిల్లా కలెక్టర్, మహబూబ్‌నగర్ వలస వెళ్ళిన వారు తిరిగి రావడము ప్రారంభించబడిందని మరియు ఈ సంవత్సరం 2.00 లక్షల టన్నుల వ్యవసాయ దిగుబడి కూడా ఉందని పేర్కొన్నారు

15. శ్రీ వెంకట రమణ రెడ్డి, సర్పంచ్ , గండీడ్ గ్రామం మరియు మండలం :
పాలమూరు-రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీమ్ రైతులకు వారి జీవన శైలిని మెరుగుపరచడంలో సహాయపడుతోందని మరియు లక్ష్మీదేవిపల్లి గ్రామంలో పాలమూరు-రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీమ్ II యొక్క కాలువ మార్గం యొక్క వివరణాత్మక మ్యాప్ కోసం అభ్యర్థించారు.

జిల్లా కలెక్టర్ గారు లక్ష్మీదేవిపల్లి కి సంబంధించిన మ్యాప్ ను నీటి వనరుల శాఖ వారి దగ్గర తీసుకోగలరు తెలిపారు

16. శ్రీ ఇంటులయ్య , MRPS నాయకుడు, హన్వాడ .
ఈ ప్రాజక్టును స్వాగతిస్తున్న ప్రజలకు ఆయన కృతజ్ఞతలు తెలిపారు మరియు ఈ ప్రాజక్ట్ మన తరానికి మాత్రమే కాకుండా భవిష్యత్తు తరాలకు కూడా ఏదరికం మరియు కష్టాన్ని తొలగించడంలో సహాయపడుతుందని కాబట్టి ప్రాజెక్ట్‌ను అభ్యంతరం చెయవద్దని ప్రజలను అభ్యర్థించారు.ఈ ప్రాజెక్టు ఎంతో మంది రైతుల కల అని తెలిపారు ప్రాజెక్ట్ పై అభ్యంతరం తెలపడం వలన. ప్రాజెక్ట్ యొక్క ప్రయోజనకరమైన ఫలితాలు కనిపించవని మరియు ప్రాజెక్ట్ పూర్తి చేయడానికి అవసరమైన త్యాగాలు చేయాలని ప్రజలను అభ్యర్థించాడు. శ్రైలం, జూరాల ప్రాజెక్టు యొక్క వాస్తవ ప్రయోజనాలు నీరు విద్యుత్ లనేది చాలా మంది ప్రజల త్యాగాలు అని కావున ఈ ప్రాజెక్టు కోసం కూడా త్యాగం చేయాలని అప్పుడే ఫలాలను పొందవచ్చని ఆయన కోరారు మరియు ఈ ప్రాతక్ట్‌ను తాను స్వాగతిస్తున్నానని ఆయన తన అభిప్రాయం వ్యక్తం చేశాడు.

పాత ప్రాజెక్టు జరాల. మరియు శ్రీశైలము వాటి వలన కలిగే లాభాల గురించి వివరిస్తూ ఈ ప్రాజెక్టుకూడా ప్రజలకు అదేవిధముగా లాభాలను ఇస్తుందని తెలియజేసినందుకు జిల్లా కలెక్టర్ గారు వారిని అభినందించారు.

17. శ్రీ ఎంవి బాలకృష్ణ , రాష్ట్ర రాజ్యం రాష్ట్ర అధ్యక్షుడు, తెలంగాణ :

ఈ ప్రాజెక్టును తను స్వాగతిస్తున్నట్లు పలికి, భూసేకరణలో భూములు కోల్పోయిన ప్రజలకు న్యాయం చేయడంతో పాటు భూ సేకరణ చట్టం 2013 ప్రకారం భూ సేకరణ జరగాలని ఆయన అభ్యర్థించారు .పూర్వము కూడా ప్రభుత్వము రైతుల నుండి ఇలానే భూములను తీసుకొని ఎకరానికి కేవలము రూ 3500 -రూ 4500 మాత్రమే చెల్లించిందని ఆయన తెలియజేశారు.పూర్వపు ప్రాజక్టు ల కోసము భూములను తమ సంస్థ నుండి బలవంతముగా లాక్కొన్నారని తన ఆవేదనను వ్యక్తము చేశారు. ప్రభుత్వము ఉద్యోగాలు ఇప్పిస్తానని హామీ ఇచ్చి అవి ఇప్పటి వరకు కూడా నెరవేర్చలేదని తెలియజేశారు . నిర్మాణము జరిగేటపుడు నాణ్యతను పరిగణలోకి తీసుకోవని ఒండు మట్టిని నిర్మాణములో ఉపయోగించాలని దీని వల్ల నాణ్యత లోపం ఏరుగుతుందని ఆయన తెలిపారు. ప్రాజక్ట్ నిర్మాణము అధికారుల పర్యవేక్షణలో జరపాలని అభ్యర్థించారు.

ప్రాజక్టు పనులు మొదలుకాక ముందే నాణ్యతను గురించి మంచి విషయములను తెలియజేసినందుకు మరియు వారి చెప్పిన విషయములను పరిగణలోకి తప్పక తీసుకుంటామని జిల్లా కలెక్టర్ గారు తెలిపారు.

18. శ్రీ లక్ష్మి నారాయణ , సర్పంచ్ , సుల్తాన్‌పల్లి (వి), హన్వాడ మండలం :

తగినంత వర్షపాతం కారణంగా (2) సంవత్సరాల నుండి పలమ వెళ్ళినవారు తిరిగి వస్తున్నారని తెలియజేశారు.నీరు తమ ఊరికి వస్తుందని అనుకోలేదని కానీ అది ఇప్పుడు రావడము చాలా ఆనందముగా వుందని పేర్కొన్నారు మరియు చిన్న మరియు సన్నకారు రైతులకు కనీసం నష్టంతో ఈ ప్రాజెక్ట్ స్వాగతించబడుతుందని కూడా ఆయన పేర్కొన్నారు.

19. శ్రీ జోగు కృష్ణయ్య గౌడ్ , R/ o. గండీడ :

పాలమూరు-రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీమ్ కోసం 2015 సంవత్సరంలో విశ్రాంత ఇంజనీర్ల పర్యవేక్షణలో సర్వే నిర్వహించబడిందని మరియు విశ్రాంత ఇంజనీర్ల సేవలు మరియు వారిజ్ఞానాన్ని వినియోగించుకోవాలని ఆయన కోరారు. స్థానిక యువతకు మాత్రమే 6000-7000 ఉపాధి కల్పించాలని ఆయన పేర్కొన్నారు.

విశ్రాంత ఇంజనీర్ల సేవలు చాలా అభినందనీయము అని వారి సేవలను ప్రభుత్వము ఎప్పుడు కోరుకుంటుందని మరియు స్థానిక యువతకు మాత్రమే ఉద్యోగ అవకాశములు కల్పిస్తామని జిల్లా కలెక్టర్ గారు తెలిపారు.

20. శ్రీ I. కృష్ణయ్య గౌడ్ , వైస్ చైర్మన్, FACS :

ఇటీవలి సంవత్సరాలలో తగినంత వర్షపాతం కారణంగా మంచి వ్యవసాయ దిగుబడి వచ్చిందని మరియు భూ సేకరణలో తమ భూములను కోల్పోయిన తర్వాత. 2 & 3 ఎకరాల భూములు ఉన్న రైతులు బోర్ నీరు అందుబాటులో లేనందున సాగు చేయలేకపోతున్నారని, అందువల్ల ప్రజలు పలస వెళ్ళి కూలీలుగా పని చేస్తున్నారని ఆయన పేర్కొన్నారు. ఈ ప్రాజక్ట్ కారణంగా కరువు పీడిత జిల్లాలు అన్నపూర్ణ జిల్లాగా మారగలవని తెలియజేశారు మరియు ఆంధ్ర రాష్ట్రములో 2 3 ఎకరాలు వున్న రైతులు కూడా ఆనందముగా వున్నారని కానీ ఇక్కడ 10 ఎకరాలు వున్న రైతులు కూడా నీరు లేనందువల్ల పంటలను పండించుకోలేక పోతునమని,ఈ ప్రాజక్టు వల్ల రైతులకు సంతోషముగా వుంటుందని ఆయన వ్యక్తము చేశారు . భూ సేకరణలో తమ భూములను కోల్పోయిన తర్వాత 10%వ్యక్తులకు బాధగా అనిపించినప్పటికి. ఈ ప్రాజెక్ట్ వల్ల 90% మందికి దీనివల్ల వుంటుందని ఆయన ఆశాభావం వ్యక్తం చేశారు

21. శ్రీ చిన్నయ్య , MPTC, కొనగటపల్లి (సైనేనిపల్లి):

జిల్లాలో తగినంత సన్నపాతం లేకపోవడం వలన దూగర్భజలాలు పీడించడం గురించి రైతు యొక్క భయంకరమైన పరిస్థితిని గురించి వివరించాడు మరియు ప్రాజెక్ట్ పూర్తయిన తర్వాత అటువంటి పరిస్థితులను అధిగమించే దిశగా వుంటుందని తనా ఆశను వ్యక్తం చేసాడు మరియు భూములు కోల్పోయి కొంతమంది బాధపడుతున్నప్పటికి ఎక్కువ మంది సంతోషంగా ఉండగలరని ఆయన వ్యక్తం చేశారు.

22. మన్నన్

అతను తన చదువుకునే సమయంలో సరైన ఆహారాన్ని కూడా పొందలేకపోయాడని, ఇప్పుడు ఈ ప్రాజెక్టు కారణంగా అతను మరింత వ్యవసాయ దిగుబడిని పొందుతాడని తెలిపారు . పూర్వము నీటి కోసము దూలా ఇబ్బంది పడ్డారని ఈ ప్రాజెక్టు వల్ల ఇక పై అటువంటి ఇబ్బంది వుండదని తెలియజేస్తూ ఈ ప్రాజెక్టును స్వాగతిస్తున్నాడని మరియు ప్రాజెక్టుకు ఎలాంటి అభ్యంతరాలు లేవని పేర్కొన్నాడు.

23. శ్రీ అనంత రెడ్డి, రైతు, పాన్వాడ :

అతను ఈ ప్రాజెక్టును స్వాగతిస్తున్నానని మరియు ఈ ప్రాజక్ట్ వల్ల పర్యావరణంపై ఎలాంటి ప్రభావం లేదని ఆయన పేర్కొన్నాడు. ఇంకా, ఈ ప్రాజెక్ట్ కోసం భూమిని కోల్పోయిన వారికి ఇతర ప్రదేశాలలో భూమిని రైతులకు ఇవ్వాలని తెలియజేశారు మరియు మండలంలోని 22000 ఎకరాల ఆయకట్టుతో పోలిస్తే ఆయకట్టు 7900 ఎకరాలు మాత్రమే కవర్ చేయబడింది అయన పేర్కొన్నారు

2 4 . శ్రీ బాలాజీ , మాజీ- సర్పంచ్ . తిర్మలగిరి గ్రామం:

ఈ పాలమూరు- రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ ప్రాజెక్ట్ తమ గ్రామంలో భాగం కావడం దూలా వరం అని ఆయన పేర్కొన్నారు .ఎండా కాలములో కూడా ఈ ప్రాజక్టు వల్ల నీటికి ఎటువంటి కొరత వుండదని ఆయన తెలియజేశారు . ఈ ప్రాజక్ట్ కారణంగా నష్టాలు కంటే లాభాలు ఎక్కువ అని మరియు ప్రాజెక్టును స్వాగతిస్తున్నాము అని ఆయన పేర్కొన్నారు.

25. శ్రీ రాములు , R/o. సల్లోనిపల్లి గ్రామం: మండలంలోని 25 గ్రామ పంచాయితీలలో కేవలం 9 గ్రామ పంచాయితీలు మాత్రమే అధికారులు ఇచ్చిన నివేదికలో కవర్ చేయబడ్డాయని మరియు నివేదిక ప్రకారం 11205 ఎకరాల భూమి సేకరించబడినప్పటికి 7986 ఎకరాలకు మాత్రమే సాగునీరు అందించబడిందని ఆయకట్టు సాగునీటిని పెంచాలని ఆయన అభ్యర్థించారు..

చిన్న, సన్నకారు రైతులకు మంచి పరిహారం లేదా ప్రభుత్వ ఉద్యోగాలతో తప్పక సాయం చేయాలని, అలాగే భూములు కోల్పోయిన చిన్న మరియు సన్నకారు రైతులకు పరిహారం అందించాలని, వారికి ప్రభుత్వ భూమిని కేటాయించాలని, అలాగే కాలువ పెను ఉపయోగకరమైన చోటులను ఉన్నసురిగా నాలులని కూడా పేర్కొన్నాడు.

26. KM నారాయణ , మాజీ సర్పంచ్ , Nancherla , Gandeed :

ఈ ప్రాజెక్టును తాను స్వాగతిస్తున్నట్లు ఆయన పేర్కొన్నారు. కొంతమంది వ్యక్తులు తమ భూములను కోల్పోవడంలో ఇబ్బందులు ఎదుర్కొంటున్నప్పటికీ, దూలా మంది ఈ ప్రాజెక్ట్ ద్వారా స్థిరపడినం పొందుతారని ఆయన అభిప్రాయపడ్డారు. నీటి కొరతకు ఈ ప్రాజెక్ట్ శాశ్వత పరిష్కారమని, అందువల్ల ఈ ప్రాజెక్ట్ కోసం ఏ పార్టీ అయినా స్వాగతించగలదని మరియు మల్లన సాగర్ & సలూరూర్ ప్రాజెక్టుల ప్రయోజనాలను వ్యక్తం చేసింది మరియు ప్రయోజనాలను పొందడానికి కాళేశ్వరం ప్రాజెక్ట్ మాదిరిగానే ప్రాజెక్ట్‌ను త్వరగా పూర్తి చేయాలని ఆయన కోరారు. భూములు కోల్పోయిన చిన్న మరియు సన్నకారు రైతులకు పెద్ద భూముల నుండి కొంత భాగాన్ని కేటాయించవచ్చని ఆయన సూచించారు.
పాత ప్రాజెక్టుల ప్రయోజనాల గురించి వివరించినందుకు జిల్లా కలెక్టర్, మహబూబ్ నగర్ ధన్యవాదాలు తెలిపారు.

జిల్లా కలక్టర్, మహబూబ్ నగర్ వారి అభిప్రాయాలు, సూచనలు మరియు ప్రశ్నలు వ్యక్తం చేసిన ప్రతి ఒక్కరికీ ధన్యవాదాలు తెలిపారు.

శ్రీ తేజస్ నందలాల్ పవార్, IAS. అదనపు కలక్టర్ (స్థానిక సంస్థలు), మహబూబ్‌నగర్ జిల్లా కలక్టర్, కాలుష్య నియంత్రణ మండలి, నీటిపారుదల అధికారులు, వాయేంట్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్, రైతులు, ప్రజా ప్రతినిధులు, రిలైర్డ్ ఇంజనీర్స్ అసోసియేషన్‌కి విలువైన సూచనలు చేసినందుకు కృతజ్ఞతలు తెలుపుతూ **పర్యావరణ ప్రజాభిప్రాయ సమావేశమును** ముగించారు. అన్ని సూచనలను సంబంధిత అధికారులకు సమర్పిస్తామని హామీ ఇచ్చారు మరియు **పర్యావరణ ప్రజాభిప్రాయ సమావేశమును** నిర్వహించినందుకు నీటిపారుదల మరియు బోర్డు శాఖ అధికారులకు ధన్యవాదాలు తెలిపారు.

ప్రతినిధుల నుండి స్వీకరించబడిన ప్రాతినిధ్యాలు ఇక్కడ జోడించబడింది..

పర్యావరణ ప్రజాభిప్రాయంలో **పాల్గొన్న ప్రజల జాబితా జోడించబడింది**

పర్యావరణ ఇంజనీర్
తెలంగాణ కాలుష్య నియంత్రణ మండలి.
ప్రాంతీయ కార్యాలయం, హైదరాబాద్

చైర్మన్ & కలక్టర్,
మహబూబ్‌నగర్ .
మహబూబ్‌నగర్ జిల్లా.

MINUTES OF THE ENVIRONMENTAL PUBLIC HEARING HELD IN CONNECTION OF M/S. PALAMARU RANGAREDDY LIFT IRRIGATION SCHEME IN MAHABUBNAGAR, RANGAREDDY, & NALGONDA DISTRICTS OF TELANGANA BY IRRIGATION AND CAD DEPARTMENT, GOVERNMENT OF TELANGANA CANAL NETWORK – PHASE II (IRRIGATION) in MAHABUBNAGAR DISTRICT ON 10.08.2021 AT 11:00AM IN THE PREMISES OF THE MANDAL PRAJA PARISHAD OFFICE, HANWADA VILLAGE AND MANDAL, MAHABUBNAGAR DISTRICT.

The following Panel Members were present:

S. No.	Name of the panel member	Department
1.	Sri S. Venkata Rao, IAS District Collector & Magistrate Mahabubnagar District	Representative of the Government – District Administration and CHAIRMAN –Environmental Public Hearing.
2.	Sri M. Dayanand T.S. Pollution Control Board, Environmental Engineer, Regional Office, Hyderabad	Representative of the Telangana State Pollution Control Board and CONVENOR - Environmental Public Hearing.

The following Government Department Officials took part in Environmental Public Hearing:

1	Sri. Tejas Nandalal Pawar, IAS, Additional Collector, (Local Bodies) Mahabubnagar District
2	Sri K. Seetarama Rao, Additional Collector, Mahabubnagar District
3	Sri D. Narsing Rao, Superintending Engineer, I&CADD., Irrigation Circle No.1, Mahebubnagar
4	Sri S. Krishna Mohan, Executive Engineer, I&CADD., Irrigation Division No.4, Mahabubnagar

The following Consultant took part in Environmental Public Hearing:

1	: Kum. Samapika Mishra, Deput manger of M/s. Voyants Solutions PVT Ltd,

ABOUT 150 PEOPLE MAHABUBNAGAR DISTRICT & OTHER AREAS GATHERED AT THE VENUE OF ENVIRONMENTAL PUBLIC HEARING.

At the outset, while welcoming the gathering, the Environmental Engineer, Regional Office- explained the features of the The Ministry of Environment, Forests and Climate Change, Government of India notified Environment Impact Assessment Notification (EIA), 2006 vide S.O.(E) No.1533, dated 14-09-2006, in supersession of the Notification dt. 27.01.1994. As per the above Notification, Prior Environmental Clearance is required for certain projects / activities (as listed in the Schedule) based on their potential environmental impacts. In accordance with the procedure laid down in the Notification, the Environmental Public Hearing is a mandatory process for the Projects covered under the Notification. The proposed Palamaru Rangareddy Lift Irrigation Scheme is an Irrigation Project which is covered under the above Notification under Category A (1(c)(ii)

– Irrigation Projects with ≥ 50,000 ha of culturable command area). As per the Notification, the projects under Category-A and Category-B1 shall undertake Public Consultation, by which the concerns of local persons who have stake in the environmental impacts of the project are ascertained.

The request for the public hearing received from the irrigation department on 07.07.2021 and the Collector and District Magistrate, Mahabubnagar has approved the note on 10.07.2021 to conduct the meeting on 10.08.2021. As per the provisions, Press Notification about the public hearing was published in Telugu and English daily news papers on 10.07.2021 i.e. Namaste Telangana news paper and The Hindu English daily news paper. The EIA / EMP & Executive summaries on the project in Telugu and English were displayed in concerned offices & villages and the same was also made available in the internet / website. Further he invited the public to share their opinions about the proposal and requested the chairman –Environmental Public Hearing, District Collector Mahabunagar District to preside over the Public hearing and conduct the proceedings.

Sri S. Venkata Rao, I.A.S., Collector and District Magistrate, Mahabubnagar has chaired the meeting duly welcoming the officials at the meeting, public representatives, press, farmers, NGOs and general public and requested the people to give opinion, suggestions on environmental issues. The Palamuru Rangareddy Project is the dream of the people of Mahabubnagar District. It is the project which fulfills the needs of drinking water, Irrigation and Industrial usage of erstwhile Mahabubnagar and Ranga Reddy Districts. The entire proceeding of the Environmental Public Hearing will be video graphed and the Video CD will be sent to the Ministry of Environment & Forests and Climate Change (MoEF& CC), Government of India along with the views and comments expressed by the public on the project.

The Collector stated that every suggestion and objection will be considered by the respective Government officials and informed that the technical details about the project will be explained by the Superintending Engineer, I&CADD., Irrigation Circle No.1, Mahabubnagar and details of Land Acquisition will be explained by the Additional Collectors present on the dias, Environmental Impact Assessment details will be explained by the Consultant from the Voyants Solutions Private Limited and requested the Superintending Engineer, Irrigation Department to explain about the project.

Sri D. Narsing Rao, Superintending Engineer has explained the details of the proposed project and its benefits in details as follows:

The newly formed districts of Mahabubnagar, Nagarkurnool, Narayanapet, Rangareddy, Vikarabad, Nalgonda in the state of Telangana are the drought prone areas in the country where drinking water is so scare. The people from these areas are migrating towards other places in the country for survival. The fluoride content in the water is high and making the survival worse. The land cultivated in these areas is also

minimal. To overcome all these problems, the Palamuru Ranga Reddy Lift Irrigation Scheme was introduced by the Government of Telangana.

90 TMC of flood water is lifted within 60 days from the back water of the Srisailman Reservoir in 5 stages and 6 reservoirs are filled for providing water to an ayacut of 12,30,000 acres in 1226 Villages of 70 mandals in 6 Districts and for industrial usage.

The project will be taken up in two different phases wherein in the first phase, construction of Approach channels, Open canals (50.49 Km.), Tunnels (61.577 Km.), Pump Houses (5 Nos.), Anjanagiri, Veeranjaneya, Venkatadri, Kurumurthyraya, Udandapur and K.P.Laxmidevipally Reservoirs (6 Nos. with a storage capacity of 67.97 TMC) which are essential for the lifting and storage of water.

In the second phase, construction of 13 Main Canals (total length of 915 Km.) and distributary network to irrigate an ayacut of 12,30,000 acres through Venkatadri, Kurumurthyraya, Udandapur and K.P.Laxmidevipally Reservoirs will be taken up.

In Mahabubnagar District, an ayacut of 2,35,318 acres will be irrigated in 247 villages of 13 Mandals through Venkatadri, Kurumurthyraya, Udandapur and K.P.Laxmidevipally Reservoirs of the project which would result in a land acquisition of 8,475 acres in the district.

The above project will be advantageous in recharging ground water levels, increasing the irrigation potential in the area, the standard of living of the farmers in the area will be improved, to provide employment to the locals during the construction of the project and fisheries, economic and commercial advantages, development of tourism and better chances of cattle rearing.

In order to accord environmental approval for the project, the public hearing is conducted and requested the public for expressing consent, suggestions or objection if any, for the project.

Further, Sri S. Krishna Mohan, Executive Engineer, I&CADD., Irrigation Division No.4, Mahabubnagar has explained following project details:

- The Telangana is the 29th state of India, formed on 2nd June 2014 with 1,12,077 Sq. km. of area and has a population of over 35 million. Forests occupy 24% of area, and about 43% of land is under cultivation.
- Ground water contributes to 75% of irrigation, while only 25% of irrigation supported by surface water supply.
- Drainage of the state can be divided into 2 major and 11 sub-basins; Godavari and Krishna are major rivers in the state, with around 73.5% of state's territory being covered by basin of these two rivers. Whereas, the proposed irrigation project will cover watershed of Krishna River basin.

- According to the agro-climatic zones, this region falls under the southern plateau and hills regions and is classified as hot semi-arid ecoregion.
- The agricultural statistics for 2015-16 indicate that Nalgonda, Mahabubnagar, and Rangareddy districts are susceptible to droughts in Telangana. There is tremendous shortage of drinking water, as these are fluonde affected areas.
- To redress this situation, the Government of Telangana have taker. up the Palamuru Ranagareddy Lift Irrigation Scheme for alleviating the misery of these drought prone areas which will benefit 70 Mandals in 6 districts with 1226 villages where about 50 lakh people would be benefitted with safe drinking water.

- The Terms of Reference (TOR) was issued vide no. J-12011/31//2017-IA-I (R), dated 11.10.2017 and it is valid till 10th of October, 2021.
- The Project Proponent of PRLIS, Irrigation and CAD Department, Govt. of Telangana, through C.E. awarded the work of EIA-EMP studies to Voyants Solutions Pvt. Ltd., Gurugram, for conducting the studies through online Tendering process.
- Previous Baselne Monitoring was conducted in Monsoon, Post-Monsoon, 2017 and Pre-monsoon, 2018. Previous Public Hearing was deferred due to unforeseen reasons.
- In compliance of provision under para 7(i) and para 2.2 of Annexure – IV to the EIA Notification, 14th September, 2006, the project proponent. submitted the draft EIA-EMP report along with executive summary to Telangana Pollution Control Board. Again Baseline Monitoring process was conducted in Project impact and study area during Monsoon and Post-Monsoon, 2019 and Pre-monsoon, 2020. Public Hearing process has been scheduled on 10th Augusl, 2021
- Palamuru-rangareddy lift irrigation project was planned in two stages Phase I: Drinking Water SupplyPhase II: Irrigation and the water source is Excess flood water of monsoon season form fore-shore of the Srisailam Reservoir.
- It can cover Mahabubnagar, Nagarkurnool, Nalgonda, Narayanpet, Vikarabad, Rangareddy district and Hyderabad city and can irrigatr 1226 villages, 70 mandals in 6 districts (Mahabubnagar, Nagarkurnool, Nalgonda, Narayanpet, Vikarabad, Rangareddy); Command Area: 1,97,976 Ha.; Length: 915.47 Km through 6 Balancing reservoir in Anjanagiri, Veeranjaneya, Venkatadri, Kurumurthyraya, Udandapur and Lakshmidevipalli; 5 stages of lifting and followed by utilization by gravity flow with storage of 90 TMC (82.52 TMC for Irrigation, 7.15 TMC for Drinking water supply and 0.33 for Industrial Use with bucjet of 52,056.31 cr.
- In the second phase, construction of 13 Main Canals (tota! length of 915 Km.) and distributary network to irrigate an ayacut of 12,30,000 acres and total 11 villages 7084 ac ayacut was covered.

The consultant Kum. Samapika Mishra, Environmental Consultant, from the Voyants Solutions Private Limited, Gurugram explained the following about the project:

- The base line of environment monitoring was conducted as per TOR issued accordance with MOEF guidelines and the parameter evlalution done in the following 6 locations of the mahabubnagar district:
    i. Boinpalle village
    ii. Munimokesham village.
    iii. Mandhanpuram Village.
    iv. Bandanadi gudur Village.
    v. Medipalle Village.
    vi. Yenkepalle Village.
- Base line monitoring was done for three seasons i.e., monsoon 2019, post monsoon & pre-monsoon 2020.
- The parameters covered are Air, water (both Ground water & surface), & soil. and shows all the value are within permissible limits.
- The noise monitoring shows that day and night time noise levels are within the prescribed limits.
- The pollutants concentration in the air is well below the permissible limit (PM10: 18.3–49.3 µg/m3; PM2.5: 9.9 – 26.9 µg/m3)The all parameters monitored in the six locations were found in permissible limit only.
- The surface water TDS level ranged between 151mg/l in monsoon and 248 mg/l in post monsoon which are in permissible limits only.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:

- Micro-climate: During Construction Phase Short Term effect on temperature and humidity, due to construction work and No effect while on Operation Phase. Controlled construction process as suggested in Environmental Management Plan (EMP) can be followed to mitigate.
- Land-use: During Construction Phase agricultural/non-agricultural land will be permanently changed to Water body or paved area. mitigation: The Improved and planned land-use development through EMP.
- Soil Quality: During Construction Phase medium impact on soil erosion, due to blasting, excavation work and No major impact while on Operation Phase. mitigation: Staggered operations along the canal alignment, top soil will be stored and used for bunding and greenbelt
- Air Environment: During construction Phase medium-high Dust Pollution, and No major Impacts while on Operation Phase. mitigation: Controlled operation with regular maintenance and pollution monitoring as per the EMP
- Impacts on Noise Environment: During construction Phase medium-high Noise Pollution; No major Impacts while on Operation Phase. mitigation: Plantation and acoustic noise barrier.

- Impacts due to Blasting: Predicted air over pressure due to blasting at shall range between 103.2 -109.8 dB(A) respectively and is lower than 120 dB(A) Controlled and Planned blasting according the Geological planning, No blasting within 300 m of settlement. Follow blasting plan for tunneling.
- Water Environment : During construction Phase increase of solid and silt concentration in river water. During Operation, impacts of accidental water Logging may occurred. mitigation: Controlled excavation in canal system. Restricted excavation during monsoon season.
- Geology: Localized and low impacts predicted mitigation: controlled and planned blasting according the geological status of the area.
- Hydrology: Proposed net ground water recharge shall be 970.24 MCM. mitigation: EMP for uncontrolled seepage and monitoring in accidental discharge in canals
- Flora: No vulnerable or endangered species will be impacted Plantation in rim area of entire canal network. mitigation: Compensatory afforestation for setting up of camps in forest areas.
- Fauna: No alteration to the existing habitat of endangered and threatened species mitigation: Controlled construction near forest areas.
- Socio-economic Condition: Improvement in irrigation and crop development with regular water supply Positive Impacts. Project will improve socio-economic condition of the area.

Further, explained about the detailed wise assigned Environmental management plan cost of Catchment Area Treatment, Plan Command Area Development, Compensatory Afforestation SchemeWildlife and Bio-diversity Management plan,Fisheries Management Plan, Resettlement & Rehabilitation Plan, Green Belt Development Plan, Reservoir Rim Treatment Plan, Muck Management Plan, Landscape and Restoration Plan Restoration Plan for Quarry SitesDisaster Management Plan,Water, Air and Noise Management Plan,Public Health Delivery Plan, Labour Management Plan,Sanitation and Solid Waste Management Plan,Local Area Management Plan,Environmental Safeguards During Construction Activities Including Road Construction Energy Conservation MeasuresEnvironmental Monitoring Plan of total 1,74,400 lakhs .

Explained about Resettlement And Rehabilitation Principles and compensation package in respect of land acquired under the RECT LAAR Act 2013 : i.e., Market value of land, Factor by which the market value is to be multiplied in the case of rural areas, Factor by which the market value is to be multiplied in the case of urban areas, Value of assets attached to land or building, Solatium , Final award in rural areas, Final award in urban areas and informed about patta land to be acquired in Mahbubnagar district for main canal is 1681 Ha, and canal branch distribution is 1750 ha and total patta land is 3431 ha.

Explained the following Project Benefits:

- Project will irrigate 4,97,976 Ha. of lands at 1226 villages, 70 mandals in 6 districts of Telangana state.
- The project will also provide safe drinking water to 6 districts and also in Hyderabad city.
- At least 50 lakhs people will be benefitted with safe drinking water and uninterrupted irrigation water for their cultivation process.
- Rabi and Kharif cultivation process will be Improved and productivity will be improved, as the project impacted area will not be affected due to drought.
- Groundwater recharge in command area will be improved
- Agro based products and industries will get boosted.
- At least 7000 job generation will be made during construction process of PRLIS Project. Indirect job generation also will be witnessed during the project construction and operation.

The same was explained by Sri S. Krishna Mohan, Executive Engineer, I&CADD., Irrigation Division No.4, Mahabubnagar in Telugu language to the public.

Further, the District Collector Mahabubnagar has thanked the consultancy, the Superintending Engineer, Irrigation Circle No.1, Mahabubnagar and other officials for giving an excellent presentation for the proposed PRLIS project in English as well as telugu and also appraised the Voyants Solutions Private Limited for their study and survey conducted in 2019 -2020 in all the areas before monsoon and after monsoon for conducting all the parmeters and furnished through a book and requested to give these copies to public representatives & farmers.

The District Collector Mahabubnagar requested the public to give their objections /suggestions in the matter.

The following persons expressed their views, suggestion and objections are as below:

1. **Sri Venkat Ram Reddy R/o. Konagatpally (V), Hanwada (M):**

   He stated that from the earlier years Palamuru is called as labour district and expressed his gladness for conducting the public hearing and stated that though the Krishna River flows for about 300 Kms. in the Mahabubnagar District, there are many people in the district who are migrating for the work to different places in the country. This project can help the farmers and their children's. The project will significantly increase the livestock sector and also the dairy industry. He expressed his hope of reverse migration after the completion of the project. There will also more industry developments and job opportunities. Further he stated that they faced scarcity of

drinking water from last fifteen years out due to the scheme of Mission Bhageeratha now they are easily getting water and also requested for Irrigation Water in Phase-II of Palamuru-Rangareddy Lift Irrigation Scheme which would result in agricultural development of the district. after completion of this project the development of the greenery in Mahabubnagar District will be look as East Godavari. Further, he stated that the Mahabunagar district has not developed even it is near to Hyderabad. This project can develop the district and stated that there is no environmental impact due to this project. He welcomed the project.

The District Collector, Mahabubnagar has thanked for the suggestions and informed that the suggestions given by him will be considered.

2. **Sri B.Naganna, State Secretary, PBUV, Hanwada:**

He expressed his gladness for developing the drought prone district to agriculturally developed district by the Palamuru-Rangareddy Lift Irrigation Scheme. The project will provide Irrigation to vulnerable and marginalized areas and make them more developed. He stated that this project is helpful for 6 district 13 Mandals 241 Grampanchayaths. He has mentioned that the details of compensation to be paid to the small and Marginal farmers in the process of land acquisition may be provide in the EMP book so that the farmers also can understand easily. He welcomed the project as it is very helpful for the development of the district.

The District Collector, Mahabubnagar has thanked for the suggestions and appreciated him for the concern shown on poor people.

3. **Sri Konda Laxmaiah R/o Hanwada:**

He stated that this project is 20 years dream of the farmers. He stated that many people are migrating for work to different places i.e., Pune, Bombay due to insufficient rainfall & water scarcity. This project can remove poverty of the district people. Further he requested for providing a map showing the passage of the Canal, details of villages and mandals for accessing the loss of natural resources and also requested for providing the reasonable compensation equal to the existing market price to the small and marginal farmers. He expressed that in AP the farmer who have 1 & 2 acre land are happy but in Telangana the farmers who have 10 Acres are facing water scarcity and unable to do the cultivation. He also questioned that, out of 35 Gram Panchayats, only 9 Gram Panchayats were mentioned that to be benefited in the report provided and requested to cover all the villages of Hanwada Mandal to benefit by alternative methods of Irrigation.

The District Collector Mahbubnagar has agreed to give the map as requested by him through concerned authorities and informed that to get the total plan regarding the project will be available in SEE Office Mahabubnagar.

4. P.Ram Reddy, Vice President, Telangana Retired Engineers Association:

He thanked the Government for proposing such a presligious project of Palamuru Rangareddy Lift Irrigation Scheme. He hoped that the reverse migration will be started due to this project. He mentioned that there is no air & water is polluting and no environment impact arising due to the construction of the project as per the study of M/s. Voyants Solutions PVT Ltd and also opined that the negatives of the project are a way smaller than that of the positive outcomes.

The District Collector, Mahabubnagar has thanked for his suggestions and the work which has done for government & public and appreciated for the similar opinion with consultancy on no effect to the environment due this project.

5. T. Venkatesham, Chairman, Telangana Engineers JAC :

He explained about the project was constructed on the Krishna River right from the Jurala project and up to the end of Bay of Bengal and the length of river flowing in the Mahabubnagar district is about 300 Kms. But the Mahabubnagar district is very back ward due to less arrount of rainfall & facing water scarcity. Further, expressed that they have fighted 6 decades for this Telangana and even facing water scarcity. He explained the detailed facts about the project in Stage I and Stage II to the farmers and public and stated that this project can give drinking water to 40 lakhs people. As per the NGT and High court orders the studies for environmental impact has done through consultancy and observed that all the values are in permissible limits. He opinion that the reverse migration of the people can be except due the this project. He requested to complete the project by working day & night.

The District Collector, Mahabubnagar thanked for his suggestions and stated that the reverse migration also started.

6. Sri Srinivas Reddy, ZPTC, Gandeed:

He opined that, In combined state of Andhra Pradesh the politicians ruled for about 60 years, no such public hearings were made and expressed his gladness for the public hearing and also appreciated the government for taking up the Kaleshwaram and Palamuru Rangareddy Lift Irrigation Scheme projects. He further, requested to complete the project as early as possible to get the benefits of the project.

7. Karunakar Goud, TRS Member:

He stated that no objection towards taking up the project and expressed that he never thought water would come to their town but it was came true that water is coming to their village by passing 110 Km. He has stated that, the mandal's rainfall has been very low since 23 years and no cultivation so most of the people are migrated to different places for work and also stated that, reverse migration has been started since from 2 years due to sufficient rainfall and expressed his hope of receiving water and stated that they will utilize the water very effectively. He

requested for detailed report of the project and thanked for convening the public hearing in Hanuwada.

The District Collector, Mahabubnagar thanked for his valuable suggestions and also appreciated for explaining so many unknown things about their village.

8. Vepuri Yadi Reddy, Member of Congress Party:

He stated that, the Palamuru-Rangareddy Lift Irrigation Scheme was a long time dream and it has come to reality now which is a pride for the mandal. He also stated that, the compensation towards the land acquisition received by the small and marginal farmers is very low and requested to compensate an amount of Rs.30.00 Lakhs to Rs. 50.00 Lakhs per acre or to provide a Government Job to them as the low compensation received by the farmers is not very helpful to them. He has requested to arrange the map showing the details of the passage of canal (survey number wise, details of the farmer, extent of land acquired) and thanked the consultant for their studies and requested to provide compensation to small and marginal farmers so as to do justice to them.

The District Collector, Mahabubnagar has informed that his suggestions will be recorded and assured to provide draft notification before land acquisition in further projects and will take the objections from the public ,then only will release the final notification and further requested the public to stress more on the environmental issues.

9. Sri V. Narayan Goud, Executive Engineer (Retd.):

He expressed his gladness for the proposal of the project in the district which lifts a water of 90 TMC. He has explained the facts and figures of the proposed project and appraised the Voyants Solutions Private Limited, Gurugram for the study and report on the project. He has expressed his hope of earliest completion of the project which helps in domestic, Irrigation and industrial usage of the water.

He has further stated that, there is no monumental and wild life damage noticed and recharge of ground water levels will be seen and expressed his hope for early approval for the project and also mentioned that safe drinking water will be available for more than 50.00 Lakh people on completion of the project. He expressed that due to this project more benefits only than the losses and only few land acquisition farmers has faced the problems so requested the government to give compensation as per the Act.

The District Collector, Mahabubnagar has thanked for raising the two main points i.e., increasing the ground water level and safe drinking water can be given to 50 lakhs people.

10. Sri Mattagalla Venkataiah ,vevesaya vrutti darula union

He stated that, the project may create complete reverse migration in the Mahabubnagar District and hoped for the welfare of the farmers by this project. He also mentioned that, in the process of the construction of the project, rights of the farmers should be protected and requested to give the compensation to the farmers who lost their land as per the 2013 Act and he suggested to take proper precaution during construction of the project and requested to provide the map showing the

passage of the canal. He also stated that due to lack of information about the public hearing, many people could not be part of the public hearing.

The District Collector, Mahabubnagar has explained that, paper publicity in Namasthe Telanagana & The Hindu has given month before the public hearing and wide publicity was given through dandora about the public hearing and also through paper publications, Display letter & Executive summary also provided in villages & Gram Panchayats.

Further, the Additional Collector, Sri K. Seeta Rama Rao has received two nos. written representations from the public suggesting that the plantation may be done on the either sides of the canal and fruit bearing plants has to be planted and in the canals, shall provide the steps for animals to drink water at some specified locations.

11. Sri Jaipal Reddy, Farmer, Kothur Village of Bhoothpur Mandal:

He expressed his sadness for losing 25 acres of his land for the Karvena Reservoir and stated that the Hon'ble Chief Minister has promised to provide a Government Job to each family who are losing their lands, but so far no job was provided and requested to provide job before starting of the project.

The District Collector, Mahabubnagar has requested him to meet at the District Collector's Office so as to do the needful.

12. Sri Anjaneyulu, Ex-Market Committee Chairman

He stated that the project is very useful for the public and described the drought situation the erstwhile Mahabubnagar District. He appreciate the consultant for carrying out the all parameters and observed that all the value are within the limits . He stated ,2 slogans regarding drought situation of Mahabubnagar District. He also opined that the Palamuru-Rangareddy Lift Irrigation Scheme is helpful in eradicating the drought from the district and welcomed the project.

13. Sri Mallu Narsimha Reddy, R/o. Ramchandrapur Village of Mahabubnagar Mandal:

He stated that the Palamuru-Rangareddy Lift Irrigation Scheme is a dream which has been fulfilled after 75 years of independence. He also stated that, being a farmer from last 34 years he is aware of the depleted ground water levels. He expressed that since from 1992, he has 24 borewells but only 8 borewells were with the water. He expressed that no borewell is needed after competition of the project and small farmers can be happy. He expressed that, he is hoping for greenery all over and reverse migration on completion of the project and requested for the early approval of the project.

The District Collector, Mahabubnagar has thanked for sharing good experience regarding ground water ,explaining about the various water issues.

14. Sri Mallu Devender Reddy, President, Raithu Bandu, Mahabubnagar Mandal:

He stated that, the Mahabubnagar people worked as a labour with daily charge of Rs. 350 and he was also worked in AP printing press. This Palamuru lift irrigation project can solve migration problem and expressed his hope of reverse migration after the completion of project. He further, expressed that the government has developed many projects like Mission Bhageeratha, Mission Kakatiya for the drinking water and also stated that many farmers will get more benefits from this project. He expressed his gladness for conducting the public hearing and providing the data. He further stated the land around the Palamuru lift irrigation project can be demandable for acre 50 lakhs due to this project and requested to provide compensation to the farmers who lost their lands.

The District Collector, Mahaoubnagar has stated that, the reverse migration has been started and also informed that there was 2.00 Lakh Tonne agricultural yield in this year.

15. Sri Venkata Ramana Reddy, Sarpanch, Gandeed Village and Mandal:

He stated that The Palamuru-Rangareddy Lift Irrigation Scheme is helping the farmers in betterment of their life style and requested for detailed map of canal passage of Palamuru-Rangareddy Lift Irrigation Scheme Stage II in Laxmidevipally village.

The District Collector, Mahabubnagar has informed that the necessary instruction has given to the irrigation department to provide the data of laximidevipally village.

16. Sri Jambulaiah, MRPS leader, Hanwada:

He thanked the people who are welcoming the project and stated that the project helps in removal of poverty and drought for not only our generation but also for the future generations and requested the public not to object the project. He stated that this project is a dream of many farmers. He also stated that, on objection of the project, the beneficial outcomes of the project will not be seen and he further, expressed that actual benefits getting from Srisallam, Jurala project & koilkonda project are i..e, water & power are the sacrifices of the many people and their lands and requested the public to make necessary sacrifices for the completion of project to get the benifits. He welcomed the project.

The District Collector, Mahbubnagar has appreciated him for explaining the benefits of the palamuru rangareddy lift irrigation project with comparison to the benefits of the old projects i.e., jurala & koilkonda

17. Sri M.B. Balakrishna, Rathu Rajyam State President, Telangana:

He stated that the project is welcomed but only with the justice done to the people who lost their lands towards acquisition and requested that the land acquisition

should be made as per the Land Acquisition Act, 2013. He expressed that, earlier the government has taken lands for the projects with the rate of Rs. 3500 & Rs. 4500 per acre which is not even sufficient for the charges and expressed that the Lands were forcibly taken .He further expressed that earlier also the government has given hope to the farmers to provide the jobs but it was not happened. He expressed that soil quality should check before the construction for the strength of the project. He also suggested that, the quality of the work should be taken care and he requested the officials for their dedication towards the project to be constructed under proper supervision.

The District Collector, Mahbubnagar has thanked for explaining the quality of the project before start up only and will take the suggestions.

18. Sri Laxmi Narayana, Sarpanch, Sallonipally (V), Hanwada Mandal:

He stated that, reverse migration has been started since (2) years due to sufficient rainfall and expressed that he didn't even thought that water will come to Hanwada but the dream came true with this project. He stated that the project is welcomed with a minimal loss to the small and marginal farmers.

19. Sri Jogu Krishnaiah Goud, R/o.Gandeed:

He stated that, the survey for the Palamuru-Rangareddy Lift Irrigation Scheme has been conducted in the supervision of the Retired Engineers in the year 2015 and requested to utilize the services and knowledge of the Retired Engineers. He also stated that the employment of 6000 to 7000 should be given to the local villagers only.

The District Collector, Mahabubnagar has stated that the knowledge of the retired Engineers will always be helpful in all the projects and also assured to provide the employment to the local only.

20. Sri I. Krishnaiah Goud, Vice Chairman, FACS:

He stated that, the farmers who have the lands of 2 & 3 acres unable to do the cultivation as no borewell & rainfall water is available, so the people are migrating and working as a labour. He opined that due to this project drought prone district can be called as "Annapurana" district. . He expressed that in AP farmers having land of 2 to 3 acres are happy but in Palamuru distnct farmers having 10 acres is not happy due water scarcity and also expressed his hope that the project could be feel difficult for 10% of people for losing their lands towards land acquisition but it add more yield to 90% of people.

21. Sri Chennaiah, M.P.T.C., Konagatpally (Nainonipally) :

He described the horrible situation of drought due to insufficient rainfall and depleted ground water levels in the district and expressed his hope towards overcoming such

situations after completion of the project. He expressed that more people will be happy even if one suffers due to this project.

22. Mannan, Gundailla co-operation, Hanwada:

He stated that during his studies he was even unable to get proper food, now due to this project more agricultural yield will come out. He expressed that due water scarcity they have faced many problems. He welcomed the project and appealed the public to no objections are made against the project as there is no impact on environment and he welcomed the project.

23. Sri Anantha Reddy, Farmer, Hanwada:

He stated that he welcomes the project and expressed that no impact on the environment due to this project. Further, he stated that the farmers who lost their land due this project can be given government land at other places and expressed that, the ayacut was covered only 7900 acres compared to the total ayacut of 22000 acres in the mandal.

24. Sri Balaji, Ex-Sarpanch, Thirmalagiri Village:

He stated that this Palamuru- Rangareddy lift irrigation project is very boon to be having part of their village and expressed that in summer also water problem can be solved due this project and there will be more benefits than the losess and no impact on the environment. He welcomed the project.

25. Sri Ramulu, R/o. Sallonipally Village:

He stated that, out of 35 Gram Panchayaths in the mandal, only 9 Gram Panchayaths are covered in the report given by the officials and as per the report, 11205 acres of land is acquired but only 7988 acres are irrigated in the mandal and requested to maximize the ayacut irrigated.

He also stated that, small and marginal farmers must be helped with good compensation or Government Jobs and also suggested that, to compensate the small and marginal farmers who lost their lands, the government land should be allotted to them and also stated that the useful plantation must be made along the canal.

26. K.M. Narayana, Ex-Sarpanch, Nancherla, Gandeed:

He stated that he welcomes the project. He opined that though few people do find difficulty in losing their lands, many people will be get benefited by the project. He expressed this project is a permanent solution for the water scarcity so any party can welcome for this project and expressed the benefits of of Mallana sagar & Salapur projects and requested to complete the project early similar to Kaleshwaram project to get the benefits. He further suggested that, the small and marginal farmers who has lost their lands may be allotted a part of the lands from the bigger farmers.

The District collector, Mahabubnagar has thanked for explaining about the benefits of the old projects.

The District Collector, Mahabubnagar has thanked each and every one who have expressed their opinions, suggestions and queries .

Further, Sri Tejas Nandlal Pawar, I.A.S., Additional Collector (Local Bodies), Mahabubnagar has concluded the Public hearing duly thanking the District Collector, Pollution Control Board, Irrigation Officials, Voyants Solutions Private Limited, Farmers, Public Representatives, Retired Engineers Association for the valuable suggestions and assured to submit all the suggestions to the concerned authorities and thanked the Irrigation and Police Department officials for organizing the public hearing.

Representations received in this connection are enclosed herewith.

List of the public participated in the public hearing is appended

Environmental Engineer
T.S. Pollution Control Board.
Regional Office, Hyderabad.

Chairman & Collector
Mahabubnagar,
Mahabubnagar District.

Public Hearing Attendance Sheet

Nagarkurnool

ENVIRONMENTAL PUBLIC HEARING

Proposed Palamuru – Rangareddy lift Irrigation Scheme for lifting of 90 TMC of flood water in 60 Days during the Flood Season from foreshore of Srisailam reservoir and Canal Network will be Developed from the reservoirs to Create Irrigation to Cland areas of Nagarkurnool, Rangareddy, Narayanpet, Mahabubnagar, Vikarabad Nalgonda Districts for an ayacut of 4,97,936 Hk (12,30,000 Acres) (Canal Network in phase-2), the Major Components of the prosed lift Irrigation Project Covers 61 Gram Panchayaths in 8 Mandals and 1,03,389 (Ayacut) of Nagarkurnool Dist

Public Hearing at:

Date: 10.08.2021, Time: 11.00 Am

Venue: Annam Venkatreddy (AVR) Garden, Veldanda, Nagarkurnool District Telangana State.

Name of the project:

M/s. palamuru – Rangareddy lift Irrigatio Scheme C

Sl.No.	Name and Designation of the official	Signature
1.	L. Sharman, I.A.S, Dist. Collector and magistrate Nagarkurnool Dist.	
2.	P. Srinivas Reddy, Add. Collector, Revenue Nagarkurnool Dist.	
3.	S. Rajeshkumar, RDO, Kalwakurthy	
4	D. Koupanand, JCEE, TSPCB	
5.	M. Krishna, Tahsildar, Veldanda 9000194462	
6.	B. Krishna Reddy EDR 7440280158	
	G. Vijaya Bhaskar Reddy, SE [illegible] Nagarkurnool	
	M. Venkata Ranga Reddy Retd EXC 9989722049	

Sl No	Name	Village	Signature
49	Shamanani Dayakar	Kuppaganda	
50	B. Shankar Naik	K.V. Kote	
51	R. Narsing Naik	K.V. Kote	
52	M. Mathiba Naik	[illegible]	
53	[illegible]	[illegible]	
54	K. Madan mohan Rao	Marchala	
55	Y. Purushotham Reddy	Veldanda	
56	M. Mallesh	Veldanda	
57	CR Venkatesh	M. Nagar	
58	M. Anusha	Siddapur	
59	T Jyothi	Achampet.	
60	S. Shivaleela	Achampet	
61	R Srinivas	Kalwakurthy	
62	K. [illegible]	[illegible]	
63	M. Narsingam	[illegible]	
64	Abdul SAIEED	Veldanda	
65	K. [illegible]	"	
66	[illegible]	"	
67	Y. Satyam	Kalwakurthy	
68	B. Ramulu	[illegible]	
69	T. [illegible]	[illegible]	
70	D. [illegible]	[illegible]	
71	V. [illegible]	[illegible]	
72	G. Tangi Reddy	Kalwakurthy	
73	G. Gopal Reddy	[illegible]	
74	G. Sudhakar Reddy	[illegible]	
75	K. Kishore Reddy	Kalwakurthy	
76	Y. Bhoja Naidu	Kalwakurthy	
77	B. Sujeevan Reddy	[illegible]	
78	M. Ramulu Naidu	[illegible]	

Sl.No	Name	Village	Signature
79	M. RAMU	Ankampet	
80	B. KUMAR	Anekunapally	B. Kumar
	Dongu	"	
81	V. PRAHLAD	K. Kudthu	
82	T. [illegible]	[illegible]	
83	Raghuveer Reddy	Kothwalguda	
84	T. Prahalad Reddy	Kodurbuthu	
85	A. Vijay	Lingareddy	
86	T. Balaji Singh	Lakmapur	
87	[illegible]	[illegible]	
88	K. Raghava Reddy	[illegible]	
89	M. Anjaneyulu	[illegible]	
90	Gyadi Reddy	Cherlagudem	
91	[illegible]	[illegible]	
92	[illegible]	[illegible]	
93	[illegible]	[illegible]	
94	[illegible]		
95	[illegible]		
96	Kumar		
97	Marchala Srinivasulu	Marchala	
98	K. Chandra Laxma Reddy	Kadumkurthy	
99	B. [illegible] Goud	Kuncala	
100	A. [illegible] Reddy	[illegible]	
101	G. Prem Kumar	Rachur	
102	P. Thirupathaiah	Kalwakurthy	
103	K. [illegible]	Anjilapur	
104	E. [illegible]	Jawalpally	
105	B. Ramakrishna	Bankapally	
106	K. Ganesh	Kalwakurthy	

Sl.No	Name	Village	Signature
107	T Laxmi Kantha Reddy	Marpally	
108	Vishnu Vardhan Reddy	Marchala	
109	T. Giridhar Reddy	Kakavakuntla	
110	కృష్ణమూర్తి	"	కృష్ణమూర్తి
111	Y. Nandya	[illegible]	
112	R. Chekkaiah	"	
		"	
113	[illegible]	"	[illegible]
114	[illegible]		[illegible]
115	J. [illegible]	[illegible]	
116	V. [illegible]	[illegible]	
117	[illegible]	[illegible]	[illegible]
118	[illegible]	[illegible]	[illegible]
119	B. Mallesh	Mallampally	[illegible]
120	[illegible]	[illegible]	[illegible]
121	L. Kanthi Goud	[illegible]	[illegible]
122	Vijay Reddy	Kankwakurthy	[illegible]
123	Shekar Reddy	"	[illegible]
124	B. Satish	Gajara	[illegible]
125	K. Bhanu	Chinnaya	[illegible]
126	K. Mahesh	Gajara	[illegible]
127	A. Suresh	Gajara	[illegible]
128	K. Govardhan Mee mpp	Kelluru	[illegible]
129	K. Ramana	Kelluru	[illegible]
130	G. Jagadeshwar MEA-Tecs	[illegible]	[illegible]
131	T. Koushik Reddy	[illegible]	[illegible]
132	[illegible]	[illegible]	[illegible]
133	M. Raj Kumar	Vakonda	[illegible]
134	T. Shekar	Peddapur	[illegible]

Sl.No	Name	Village	Signature
135	[illegible]		[illegible]
136	[illegible]	[illegible]	[illegible]
137	[illegible]		[illegible]
138	Hareesh		H. Hareesh
139	V. Kiran Kumar	[illegible]	V. [illegible]
140	[illegible]	[illegible]	[illegible]
141	[illegible]	[illegible]	[illegible]
142	[illegible]	[illegible]	[illegible]
143	K. Ramesh	[illegible]	[illegible]
144	G. Venkatarao	[illegible]	[illegible]
145	B. RAMULU	Lingasamudram	B. Ramulu
146	K [illegible]	[illegible]	[illegible]
147	[illegible]	[illegible]	[illegible]
148	N. Narasimha Reddy	[illegible]	[illegible]
149	K. Nageshwar	[illegible]	[illegible]
150	Gopal	[illegible]	[illegible]
151	Aineni Sreelya Pochaiah Rao	Kalvacherla	[illegible]
152	A. Jangaiah	Jillella	[illegible]
153	V. Shalem Reddy	Jillella	[illegible]
154	P. Ramulu	[illegible]	[illegible]

Minutes of Meeting-Public Hearing

NagarKurnool

THE MINUTES OF THE ENVIRONMENTAL PUBLIC HEARING HELD FOR THE PROPOSED PALAMURU RANGAREDDY LIFT IRRIGATION SCHEME (PRLIS) LIFTING OF 90 TMC OF FLOOD WATER IN 60 DAYS DURING THE FLOOD SEASON – CANAL NETWORK – PHASE II (IRRIGATION) AT ANNAM VENKATREDDY (AVR) GARDEN VELDANDA, NAGARKURNOOL DISTRICT OF TELANGANA STATE, ON 10.08.2021 AT 11:00AM.

I. The following Panel Members were present:

S. No.	Name of the panel member	Department
1)	**Sri L. Sharman, I.A.S.** Collector & District Magistrate, Nagarkurnool District	**CHAIRMAN** - Environmental Public Hearing.
2)	**Sri. D. Krupanand.** Joint Chief Environmental Engineer, TS Pollution Control Board, Zonal Office: Hyderabad.	Representative of the Telangana State Pollution Control Board and **CONVENOR** - Environmental Public Hearing.

II. The following Officials & Representative of the project were present:

1	Sri P. Srinivas Reddy, Additional Collector & Revenue, Nagarkurnool District.
2.	Sri G. Vijaya Bhaskar Reddy, SE, Irrigational Dept., Nagarkurnool District.
3.	Sri S. Rajesh Kumar, RDO, Kalwakurthy (M), Nagarkurnool District.
4.	Sri M. Krishna Tahsildhar, Veldanda (V), Kalwakurthy (M), Nagarkurnool District.

At the outset, while welcoming the gathering, the Joint Chief Environmental Engineer, Zonal Office - Hyderabad, Telangana State Pollution Control Board (TSPCB) Sri. **D. Krupanand** explained the features of the Ministry of Environment and Forests & Climate Change (MoEF&CC), Government of India in S.O.1533 dated 14/09/2006. According to the EIA Notification, Environmental Public Hearing is mandatory for obtaining Environmental Clearance to the proposed PalamaruRangareddy Lift Irrigation Scheme at Nagarkurnool District. The Irrigation Department of Nagarkurnool District has requested the Pollution Control Board, Regional Office, Hyderabad on 07.07.2021 for facilitating the Public Hearing along with TORs, Draft EIA reports and Executive summaries. The JCEE has informed that the press notice was issued on 19.07.2021 in two newspapers i.e. "Namaste Telangana" (Telugu Daily) and "Hans India" (English Daily) intimating about the proposed Public Hearing to be held on 10.08.2021 with Project details for inviting suggestions, views, comments and objections from the Public for the proposed Palamaru Rangareddy Lift Irrigation Scheme in Nagarkurnool District. Further, the JCEE informed that, the entire process of Public Hearing will be video recorded and along with the Minutes of the Meeting will be forwarded to MoEF, GoI. The JCEE has requested the Collector & District Magistrate, Nagarkurnool to preside over the Public Hearing and conduct the proceedings.

The Collector & District, Nagarkurnool District while inviting the people gathered and informed that the vide publicity of the proposed Public Hearing for the Palamuru Rangareddy Lift Irrigation Scheme was done through Tam Tam and Banners. The Collector further stated that, the project proponent will explain the salient features of the project with Palamuru Rangareddy Lift Irrigation Scheme and proposed pollution control measures along with details of EIA study carried out in and around the project site and requested Public to express their suggestions, comments, opinion and objections pertaining to the Environmental aspects of the proposed Lift Irrigation Scheme.

- **Sri. G. Vijaya Bhaskar Reddy, Supt. Engineer, Irrigation Department, Nagarkurnoool District:** He informed that Public Hearing is conducted to take suggestions, views, comments from the Public. He explained about project stating that, the project is proposed to improve Agriculture, Availability of Drinking Water. He further stated that, 6 District i.e. Mahaboobnagar, Narayanpet, Nalgonda, Nagarkurnool, Rangareddy and Vikarbad District are backward areas in India where the percentage of migration is huge compared to other places of India. Due to severe drought the drinking water scarcity is more in these areas. The Land suitable for Agriculture is very less compared to available total area due to the lack of availability of water in these areas. This kind of project can improve the agriculture lands and facilitates the jobs due to availability of water. Further he stated that, this areas regularly subjected to severe drought due to non availability of water. Gross Command Area - 8,83,945 hat Cultivable Command Area: 4,97,976 ha. water will be sourced from fore shore of Srisailam Reservoir on the Krishna River basin near Yellur village at Kollapur mandal, in Mahbubnagar district. The Lift Irrigation project will comprise of 6 balancing reservoirs (Anjanagiri, Veeranjaneya, Venkatadri, Kurumurthyraya, Uddandapur and Lakshmidevipally) and 5 stages of lifting, which will be a combination of open cannel and tunnels etc. The irrigation water further shall be distributed through gravity. The total length of the irrigation canal network is 915.47 Km. Out of 90 TMC excess flood water of Srisailam Reservoir, the project will utilize 82.52 TMC for Irrigation, 7.15 TMC for Drinking water supply and 0.33 for Industrial Use. He also informed that, the 8 Mandals and 61 villages of Nagarkurnool District can be benefited with this project which can improve the life style of farmers

Smt. Disha Rao, Environmental Consultant, M/s. Voyants Solutions Private Limited informed the following:

- M/s. Voyants Solutions Pvt. Ltd. Gurugram, Haryana, has conducted the Environment Impact Assessment Study as per approved ToR issued by the MoEF&CC, New Delhi, vide letter dated 11.10.2017 and the TOR is valid till 10.10.2021.
- She explained about the Baseline Monitoring that was conducted in Monsoon season, 2019, post-monsoon season, 2019 and Pre-monsoon season, 2020.
- It was explained that the existing status of Air Quality was evaluated by setting up six locations to conduct air quality monitoring in respect of PM2.5, PM10, SO2 and NOx.
- The sound level was measured at six locations by sound level meter.

- Physical and chemical characteristics of the soil were studied in respect of six samples taken from the study area.
- Samples were taken from six locations for evaluating physical, chemical and biological characteristics of surface and ground water.
- Phytosociology of plants and diversity of the forest vegetation was determined based on field survey of the area. Various transects were identified along the villages to carry out faunal studies.
- The data on socio economic was collected to gather information on public perception of the proposed project. Data was also collected from secondary sources to validate the information and to supplement the data on demographic aspects.

Analysis results of Baseline Monitoring:

- The results of the soil analysis was shared and was explained that the soil is neutral to slightly basic at all the locations having pH varying from 7.20 to 7.65. The texture of the soil varies from sandy clay loam to clay. Available nitrogen content in the surface soils ranges between 133.5 to 185.2 kg/ha thereby is indicating that soils are low in available nitrogen content. Available phosphorus content ranges between 12.1 to 15.9 kg/ha. thereby indicating that soils are medium in available phosphorus. Available potassium content in these soils ranges between 167.3 to 204 kg/ha. thereby indicating medium to high in potassium content. The organic carbon varies from 0.49 % to 0.73% thereby implying that soils have low to medium organic carbon
- The pollutants concentration in the air is well below the permissible limit (PM10: 18.3 49.3 µg/m3; PM2.5: 9.9 26.9 µg/m3; NOx: 7.5-18.3 µg/m3) and SO2: 5-7.4 µg/m3 as there are no industries in the area and the density of vehicular traffic is not alarming.
- The noise monitoring shows that day and night time noise levels are within the prescribed limits.
- The analysis results have been compared with the Tolerance limits for inland surface waters. Class C. The pH values ranged between 7.60-8.16 and was within the permissible limit (6.5-8.5) The TDS levels ranged from 151 to 248 mg/l and were well below the desirable limit of 500 mg/l. The chlorides level in surface water samples ranged from 24.6 to 50 mg/l and were below the desirable limit of 250 mg/l. The sulphates level ranged from 18.5 to 37.2 mg/l and were below the desirable limit of 200 mg/l. The nitrate level ranged between 2.6 to 4.1 mg/l and was lower than the desirable limit of 45 mg/l. The ground water had all parameters within the desirable limits.

Evaluation of Impacts:

- Impacts Due to construction activities were explained, there shall be temporary and nominal effect on the ambient temperature and humidity. The operation stage project may not create any impact on the meteorology and climatology of the area.

- During the operation phase no change in land use is expected. Many of the redundant areas having no further usage will be brought under plantation.
- Soil erosion due to project activities will not exist in the operation phase as the construction would be completed and landscape restoration work would also be implemented
- The intensity of anticipated environmental impact on geology of the area will be weak and extent of anticipated impact will be local. No impact is anticipated on the geology of the area during the operation phase.
- Ground water recharge from implementation and operation of PRLIS system shall be due to seepage from reservoir, losses from canal system and field application.
- Temporary changes in air quality during construction phase are expected due to emission from vehicles and blasting operations. The resultant impact on the Ambient air quality are within the NAAQS.
- Temporary increase in noise levels are expected during construction phase only.
- The impact on water bodies during construction with the slight increase in turbidity in the river/ water bodies but the transparency of the water shall not be impaired. Apart from ground water recharge, quality of ground water will also improve in the entire area.
- The vegetation composition of the project zone is widely distributed and there will be no significant loss to the habitat. However, any loss of vegetation during the project activity period will be restored in due course of time. The floral abundance of the project area in post construction phase will increase by many folds as the plantation under green belt, restoration and landscaping will be completed.
- There will be no alteration to the existing habitat of endangered and threatened species. There is also no wildlife sanctuary, national park and biosphere reserve near the project area
- There is no any displacement and R&R due to the Project. The Compensation for the land acquisition shall be given as per Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation & Resettlement (RFCTLARR) Act 2013 and Telangana State Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2014.

Project Benefits:

Following benefits were explained to the stakeholders, villagers present in the public hearing in English and Local Language.

- Project will irrigate 4,97,976 Ha. of lands at 1226 villages, 70 mandals in 6 districts of Telangana state.
- The project will also provide safe drinking water to 6 districts and also in Hyderabad city.
- Atleast 50 lakhs people will be benefitted with safe drinking water and uninterrupted irrigation water for their cultivation process.
- Rabi and Kharif cultivation process will be improved and productivity will be improved, as the project impacted area will not be affected due to drought.
- Groundwater recharge in command area will be improved
- Agro based products and industries will get boosted.

- Atleast 7000 job generation will be made during construction process of PRLIS Project. Indirect job generation also will be witnessed during the project construction and operation.

After the above presentation the Collector & District Magistrate has invited the Public for expressing their suggestions, opinion and objection about the PRLIS project.

The following persons expressed their views, suggestion and objections are as below:

1.Smt.Vijitha Reddy, Cherkuru Village.

She has briefed that, the Palamuru District is named after the abundant availability of Pal(Milk), Perugu(Curd), which replicates the richness of the people. But, over the time the scenario of the district has changed and people started migrating to other districts in search of livelihood. With these irrigation Projects she is expecting back the deserved and better life style of palamuru district. She further expressed that this project has no impact on environment and requested to complete at the earliest.

2. Bhoopathi Reddy, Veldanda, Sarpanch.

He expressed that, on listening of Executive Summary he understood that, veladandamandal comprising 8 gramPanchyats and having an ayacut of 21,404 Acres. He said that, for the last 100 years kalwakurthy area have received least rainfall. He further opined that, they are fortunate enough to get the project and expects ground water recharge. He requested the Project authorities to complete as soon as possible. Lastly, he opined that this Project has no impact on Environment.

3. P. Kishta Reddy, Veldanda.

He expressed that this Project is a dream of decade. He said that they have participated in several agitations over Irrigation Projects. He Further, requested the Project authorities to brief water conveyance strategy to the veldandamandal and also requested for righteous amount of compensation.

4. Balayya, AMC, Chairman, kalwakurthy.

He expressed that, this project has no impact on environment as project area does not involve any monuments, temples etc. He requested to complete at the earliest.

5. BhaskaraRao, Veldanda.

He expressed that this Project is proposed to irrigate the lands in drought prone area and the Project has no impact as it does not involve any dense forests, tiger reserves, no precious species. He further added that, due to this Project ground water will increase, which turns these drought prone lands as vegetated lands.

6. Guruvaiah Goud, SAC'S Chairman, Vangoor, Veldanda.

He expressed that, this Project has no impact on environment. He said that, since past 100 years injustice done in river water distribution to the Telangana. He said that, they have labour, land, resources etc. But, no water. Hence, they are lagging in development. He recommended to speed up the compensation.

7. Bejja Yadaih Goud, Charakonda.

He expressed that, in previous Governments ryths were in depression. Now, after formation of new Government, and with the help of new Schemes and flagship programmes of Government ryths economic states have improved and they are happy. He expressed that, he will support any Project launched by the Government. He is expecting drinking water from this PRLIS Project.

8. Venkata Ranga Reddy (Rtd.ENC), Singotam Village, Kollapur.

He expressed that, in PRLIS Reservoirs are formed with a bund length of 65 kms. and he tried to explain the different types of soils are required for banking and it is required to inform from where these soils are acquired for banking. While stating that Kosgi Venkataiah have petitioned a case in High court regarding mining of soils in telangana area for the purpose of Project use. Briefing the case he said that, Black Cotton soils are to be used for banking. He further, stated that this dredging Process is indirectly helping the tanks to store to its ful. capacity and there by using for reservoir bund formation. He opined that, the word used by kosgiVenkataiah mining is wrong and it is dredging and it is very much useful. Lastly he briefed that this project has least impact on Environment. We get water from this Project, there by increase in greenery, Oxygen level in atmosphere. Further, told that lively hood also increases.

9. Aiwal Reddy, Kotra.

He requested the Project authorities to complete the PRLIS Project on fast track and also requested to announce righteous compensation to the land loosers.

10.Parvath Reddy.

He said that, earlier in his area he realised no rains, no yield. But, once they got the water through KLI he got 200 Quintals Production in a year. He further, requested to release water up to nagillathrough D 82 of KLIS. He requested project authorities to complete the project on fast track. And also demanded a righteous compensation for land loosers.

11.Edla Satyam, Chair person, Muncipal Council, kalwakurthy.

He said that, in midjil (V), Mahabubnagar District, lowest rainfalls recorded in the past. Once they got the water through KLI canal, they are getting good rain falls. He feels that, environment is balanced.

12.Balaji Singh, ZP Vice Chairman:

He expressed that environment comprises of air, water, soil, animals etc. But this Project has no impact on any of these. Hence, expressed no impact on environment. Further, requested the Project authorities to complete as early as possible. And also to release the compensation to the land loosers immediately.

13.Narayana, vangoor.

He expressed that no compensation paid to the land loosers in any Project. Hence, requested to release the same. Further, told that with the PRLIS Project, there is no impact on the environment.

14.A. Vijay, Lingareddypalle.

He expressed that no Compensation paid to the land loosers. He requested to compensate at the earliest. Further expressed that there is no impact on Environment with PRLIS Project.

15. V.ShankarNaik, KhayaniTanda

He expressed that no compensation paid to the land loosers. Further, expressed that with PRLIS Project, there is no impact on the environment.

16. Sudarshan Reddy,

He expressed that in any Project there will be few merits and demerits will there. He further expressed that to release early compensation to the land loosers and requested the Project authorities not to delay.

17. P. Ramulu, CherlaItikyala

He expressed that PRLIS have no impact on environment. And also requested to release the land compensation at the earliest

18. Motilal, Raghaipally.

He expressed that, since his childhood he is listening about the PRLIS project. Still the work is going on. Further, expressed that, there is no impact on Environment with this Project

19. Shekhar Reddy, kalwakurthy.

He expressed that, he came to know that PRLIS Canal alignment is passing through Klawakuthyt own and it is effecting patta lands in that town. He requested to de-route the canal and to see to pass through Government lands near by.

20. Potugandi Bharat Prasad, ZPTC.

He expressed that, after going through EIA, EMP Booklets be suggested to get the awareness among Public. He has suggested to divert useful soils for farming and useless soils for reservoir purpose. He further suggested to recheck correctness of rate adopted to arrive land compensation

which mentioned in EMP Booklets. Further, he informed that, due to the various Projects in the area greenery increased by 23%. He requested for including the disaster management plan for the Project.

21. Sri. JaipalYadav, Hon'ble MLA.

He briefed about the water allocation to the Telangana and AP by Bachavath Tribunal. He further expressed that around 15 lakh people migrated from mahabubnagar in search of livelihood and wished for the reverse migration of the public with the upcoming projects. In the year 2012-13 Shri. KiranKumar, Honble, Chief Minister has sanctioned 7.5 Cr for Survey of this Project. In the 2014, Honble,PM during his visit to talangana have assured the national satus to PRLIS Project as Polavaram Project in AP.

While optimizing the proceedings of the public hearing, the Collector thanked the public for cooperating in smooth conduct of public hearing and expressing their views, suggestions and opinions. It is also informed that, all the proceedings of the hearing was recorded and will be sent to the government for taking further necessary action in respect to environmental clearance.

The JCEE, TSPCB while summarizing the proceedings of the Public Hearing, has informed that the Minutes of the Meeting and Video recorded will be forwarded to the Government of India for taking further necessary action.

The 2 No. of Representations were received during the Public Hearing on 10.08.2021 are annexed.

The Public Hearing concluded with a positive note and vote of thanks by the JCEE, TSPCB.

List of the Officials and public participated in the public hearing is appended.

Joint Chief Environmental Engineer.
TSPCB, Zonal Office, Hyderabad.

Collector & District Magistrate.
Nagarkurnool District.

ANNEXURE

REPRESENTATIONS RECEIVED FROM VILLAGERS, NGOS & PUBLIC REPRESENTATIVES PRIOR AND DURING EPH.

Sl.No.	Representations given by	Date of Receipt	Content of the representation
	Sarvasri		
1.	Environmental Pollution Control Awareness Society	10.08.2021	Supported the project
2.	Manava Vanarula & Vaikalangula Sankshema Sangam, Saroornagar	10.08.2021	Supported the project

పాలమూరురంగారెడ్డి ఎత్తి పోతల పథకం (PRLIS) - కెనాల్స్ట్రక్చర్ - దశ – 2 (నీటిపారుదల), నీటిపారుదల మరియు ఆయకట్టు అభివృద్ధిశాఖ, తెలంగాణప్రభుత్వం, ప్రతిపాదిత నీటిపారుదల ప్రాజెక్ట్ ప్రధాన కాలువల ద్వారా నారాయణపేట జిల్లాలో 9 మండలాలు, 155 గ్రామపంచాయతీలలో 1,60,955 ఎకరాలమెట్ట ప్రాంతాల ఆయకట్టుకు సాగు నీటి వసతులు కల్పించడం కోసం తేది 10.08.2021 ఉదయము 11:00 గంటలకు అన్నం వెంకటరెడ్డి, (AVR) గార్లపల్లి, నాగర్‌కర్నూల్ జిల్లా, తెలంగాణ ప్రాంగణంలో చేపట్టిన పర్యావరణ ప్రజాభిప్రాయము తెలుసుకోవడానికి సమావేశము నిర్వహించారు.

I. క్రింది ప్యానెల్ సభ్యులు హాజరయ్యారు

క్రమ సంఖ్య.	ప్యానెల్ సభ్యుని పేరు	శాఖ
1.	శ్రీ ఎల్. శర్మన్, I.A.S. కలెక్టర్ & జిల్లా మేజిస్ట్రేట్, నాగర్ కర్నూల్ జిల్లా	ఛైర్మన్ - పర్యావరణ పబ్లిక్ హియరింగ్.
2.	శ్రీ. డి. కృపానంద్, జాయింట్ చీఫ్ ఎన్విరాన్‌మెంటల్ ఇంజనీర్. TS కాలుష్య నియంత్రణ బోర్డు. బోనల్ కార్యాలయం: హైదరాబాద్.	తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి ప్రతినిధి మరియు కన్వినర్ - పర్యావరణ పబ్లిక్ హియరింగ్.

II. ప్రాజెక్ట్ యొక్క క్రింది అధికారులు & ప్రతినిధి ఉన్నారు:

1.	శ్రీ పి.శ్రీనివాస రెడ్డి, అదనపు కలెక్టర్ & రెవెన్యూ, నాగర్ కర్నూల్ జిల్లా.
2.	శ్రీ సి. విజయ భాస్కర్ రెడ్డి. సి, నీటిపారుదల శాఖ, నాగర్ కర్నూల్ జిల్లా.
3.	శ్రీ ఎస్. రాజేష్ కుమార్, RDO, కల్వకుర్తి (M), నాగర్ కర్నూల్ జిల్లా.
4.	శ్రీ ఎం. కృష్ణ తహసీల్దార్, వెలుదండ (వి), కల్వకుర్తి (ఎం), నాగర్‌కర్నూల్ జిల్లా

జాయింట్ చీఫ్ ఎన్విరాన్‌మెంటల్ ఇంజనీర్, బోనల్ ఆఫీస్ - హైదరాబాద్, తెలంగాణ స్టేట్ పొల్యూషన్ కంట్రోల్ బోర్డ్ (TSPCB) శ్రీ. డి. కృపానంద్ ప్రారంభంలో, సమావేశానికి స్వాగతం పలుకుతూ. S.O.1533 తేది 14/09/2006 భారతదేశం యొక్క లో పర్యావరణ మరియు అటవీ & వాతావరణ మార్పు మంత్రిత్వ శాఖ (MoEF & CC) యొక్క లక్షణాలను వివరించారు. EIA నోటిఫికేషన్ ప్రకారం, నాగర్ కర్నూల్ జిల్లాలోని ప్రతిపాదిత పాలమూరురంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ పథకానికి పర్యావరణ క్లియరెన్స్ పొందడానికి పర్యావరణ పబ్లిక్ హియరింగ్ తప్పనిసరి. నాగర్ కర్నూల్ జిల్లా నీటిపారుదల శాఖ TOR లు, డ్రాఫ్ట్ EIA నివేదికలు మరియు కార్యనిర్వాహక సారాంశాలతో పాటు బహిరంగ విచారణను సులభతరం చేయడానికి కాలుష్య నియంత్రణ మండలి, ప్రాంతీయ కార్యాలయం, హైదరాబాద్‌ని 07.07.2021 న అభ్యర్థించింది. JCEE 10.07.2021 న

రెండు వార్తాపత్రికలలో ప్రెస్ నోటీసు జారీ చేయబడిందని తెలియచేసారు. నాగర్ కర్నూల్ జిల్లాలోని ప్రతిపాదిత పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీమ్ కోసం ప్రజల నుండి సూచనలు, అభిప్రాయాలు, వ్యాఖ్యలు మరియు అభ్యంతరాలను ఆహ్వానించడానికి వివరాలు. ఇంకా, JCEE, పబ్లిక్ హియరింగ్ ప్రక్రియ మొత్తం వీడియో రికార్డ్ చేయబడుతుంది మరియు సమాచార నిమిషాలతో పాటు MoEF, GoI కి పార్శ్వికి చేయబడుతుంది JCEE, కలెక్టర్ & జిల్లా మేజిస్ట్రేట్, నాగర్ కర్నూల్ ప్రజా విచారణకు అధ్యక్షత వహించాలని మరియు విచారణలను నిర్వహించాలని అభ్యర్థించారు.

కలెక్టర్ & జిల్లా, నాగర్ కర్నూల్ జిల్లా: ప్రజలను ఆహ్వానిస్తూ, పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీమ్ కోసం ప్రతిపాదిత పబ్లిక్ హియరింగ్ యొక్క విస్తృత ప్రచారం టామ్ టామ్ మరియు బ్యానర్ల ద్వారా జరిగిందని తెలియచేసారు. పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీమ్ మరియు ప్రతిపాదిత కాలుష్య నియంత్రణ చర్యలతో పాటు ప్రాజెక్ట్ స్టాట్లో మరియు చుట్టుపక్కల జరిపిన EIA స్టడీ వివరాలతో ప్రాజెక్ట్ యొక్క ప్రధాన లక్షణాలను ప్రాజెక్ట్ ప్రతిపాదకుడు వివరిస్తారని కలెక్టర్ తెలిపారు. ప్రతిపాదిత లిఫ్ట్ ఇరిగేషన్ స్కీమ్ యొక్క పర్యావరణ అంశాలకు సంబంధించిన వ్యాఖ్యలు, అభిప్రాయాలూ, సూచనలు, మరియు అభ్యంతరాలు తెలుపమని విచ్చేసిన ప్రజలను కోరారు.

శ్రీ. జి. విజయ భాస్కర్ రెడ్డి, Supt. ఇంజనీర్, నీటిపారుదల శాఖ, నాగర్ కర్నూల్ జిల్లా: ప్రజల నుండి సూచనలు, అభిప్రాయాలు, వ్యాఖ్యలు తీసుకోవడానికి పబ్లిక్ హియరింగ్ నిర్వహిస్తున్నట్లు అయన తెలియజేశారు. వ్యవసాయం, తాగునీటి లభ్యత మెరుగుపరచడానికి ఈ ప్రాజెక్ట్ ప్రతిపాదించబడిందని పేర్కొన్న ప్రాజెక్ట్ గురించి అయన వివరించారు. 6 జిల్లాలు అంటే మహబూబ్ నగర్, నారాయణపేట, నల్గొండ, నాగర్ కర్నూల్, రంగారెడ్డి మరియు వికారాబాద్ జిల్లా, భారతదేశంలోని ఇతర ప్రాంతాలతో పోలిస్తే వలసల శాతం అధికంగా ఉన్న వెనుకబడిన ప్రాంతాలు. తీవ్రమైన కరువు కారణంగా ఈ ప్రాంతాల్లో తాగునీటి కొరత ఎక్కువగా ఉంది. ఈ ప్రాంతాలలో నీటి లభ్యత లేనందున అందుబాటులో ఉన్న మొత్తం ప్రాంతంతో పోలిస్తే వ్యవసాయానికి అనువైన భూమి చాలా తక్కువ. ఈ రకమైన ప్రాజెక్ట్ వ్యవసాయ దూములను మెరుగుపరుస్తుంది మరియు నీటి లభ్యత కారణంగా ఉద్యోగాలను సులభతరం చేస్తుంది. ఇంకా, ఈ ప్రాంతాలలో నీరు అందుబాటులో లేనందున క్రమం తప్పకుండా తీవ్రమైన కరువును ఎదుర్కొంటున్నాయని అయన పేర్కొన్నారు. స్థూల కమాండ్ ప్రాంతం - 8,83,945 హెక్టార్లు; సాగు చేయదగిన కమాండ్ ప్రాంతం: 4,97,376 హెక్టార్లు. మహబూబ్‌నగర్ జిల్లాలోని కొల్లాపూర్ మండలం యెల్లూరు గ్రామానికి సమీపంలో ఉన్న కృష్ణానది పరీవాహక ప్రాంతంలోని శ్రీశైలం రిజర్వాయర్ ముందు ఒడ్డు నుండి నీరు తీసుకోబడుతుంది. లిఫ్ట్ ఇరిగేషన్ ప్రాజెక్టులో 6 బ్యాలన్సింగ్ రిజర్వాయర్లు (అంజనగిరి, పేరూంబనయ, వంకటాద్రి, కురుమూర్తిరాయ, దుందుంపూర్ మరియు లక్ష్మీదేవిపల్లి) మరియు 5 దశల లిఫ్టింగ్ ఉన్నాయి, ఇది ఓపెన్ కెనెల్ మరియు టన్నెల్స్ కలయికగా ఉంటుంది. నీటిపారుదల కాలువ నెట్‌వర్క్ మొత్తం పొడవు 915.47 కిమీ. శ్రీశైలం రిజర్వాయర్ యొక్క 90 టీఎంసీల అదనపు వరద నీటిలో, ఈ ప్రాజెక్ట్ 82.52 టీఎంసీల ఇరిగేషన్, 7.15 టీఎంసీల తాగునీటి సంపరా మరియు 0.33 పారిశ్రామిక వినియోగానికి ఉపయోగించబడుతుంది. నాగర్ కర్నూల్ జిల్లాలోని 8 మండలాలు మరియు 61 గ్రామాలు రైతుల జీవన విధానాన్ని మెరుగుపరిచే ఈ ప్రాజెక్ట్ ద్వారా లబ్ధి పొందవచ్చని కూడా అయన తెలియజేశారు.

శ్రీమతి. దిశా రావు, పర్యావరణ సలహాదారు, M/s. Voyants సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్ కింది వాటిని తెలియజేసింది:

- M/s. Voyants సొల్యూషన్స్ ప్రై. లిమిటెడ్, గురుగ్రామ్, హర్యానా, MoEF & CC, న్యూ ఢిల్లీ ద్వారా జారీ చేయబడిన ఆమోదిత TR ప్రకారం ఎన్విరాన్మెంట్ ఇంపాక్ట్ అసెస్మెంట్ స్టడీని నిర్వహించింది. 11.10.2017 నాటి లేఖ మరియు TOR 10.10.2021 వరకు చెల్లుబాటు అవుతుంది.
- వర్షాకాలం, 2019, రుతుసమనాల తర్వాత, 2019 మరియు వర్షాకాలం ముందు, 2020 లో నిర్వహించిన బేస్‌లైన్ మానిటరింగ్ గురించి ఆమె వివరించారు.
- PM2.5, PM10, SO2 మరియు NOx లకు సంబంధించి గాలి నాణ్యత పర్యవేక్షణను నిర్వహించడానికి ఆరు ప్రదేశాలను ఏర్పాటు చేయడం ద్వారా గాలి నాణ్యత యొక్క ప్రస్తుత స్థితిని అంచనా వేసినట్లు వివరించారు.
- సౌండ్ లెవల్ మీటర్ ద్వారా సౌండ్ లెవల్ ఆరు ప్రదేశాలలో కొలుస్తారు.
- మట్టి యొక్క భౌతిక మరియు రసాయన లక్షణాలు అధ్యయన ప్రాంతం నుండి సేకరించిన ఆరు నమూనాలకు సంబంధించి అధ్యయనం చేయబడ్డాయి.
- ఉపరితల మరియు భూగర్భ జలాల భౌతిక, రసాయన మరియు జీవ లక్షణాలను విశ్లేషించడానికి ఆరు ప్రదేశాల నుండి నమూనాలు తీసుకోబడ్డాయి.
- మొక్కల ఫైటోసోషియాలజీ మరియు అటవీ వృక్షసంపద యొక్క సైనిధ్యం ఈ ప్రాంత క్షేత్ర సర్వే ఆధారంగా నిర్ణయించబడింది. జంతుజాల అధ్యయనాలను నిర్వహించడానికి గ్రామాల పెంబడి వివిధ మార్గాలు గుర్తించబడ్డాయి.
- ప్రతిపాదిత ప్రాజెక్ట్ యొక్క ప్రజల అభిప్రాయంపై సమాచారాన్ని సేకరించడానికి సామాజిక ఆర్థికంపై డేటా సేకరించబడింది. సమాచారాన్ని ధృవీకరించడానికి మరియు జనాభా అంశాలపై డేటాను పెర్చి చేయడానికి ద్వితీయ మూలాల నుండి కూడా డేటా సేకరించబడింది.

<u>బేస్‌లైన్ మానిటరింగ్ యొక్క విశ్లేషణ ఫలితాలు:</u>

- నేల విశ్లేషణ ఫలితాలు సంగ్రహించబడ్డాయి మరియు 7.20 నుండి 7.65 వరకు ఉండే pH ఉన్న అన్ని ప్రదేశాలలో నేల కొద్దిగా ప్రాథమికంగా తటస్థంగా ఉంటుందని వివరించబడింది. నేల ఆకృతి ఇసుక టంకమట్టి నుండి మట్టి వరకు మారుతుంది. ఉపరితల నేలల్లో లభ్యమయ్యే నత్రజని కంటెంట్ 133.5 నుండి 185.2 కిలోల/హెక్టార్ల మధ్య ఉంటుంది. తిద్వారా అందుబాటులో ఉన్న నత్రజని కంటెంట్ తక్కువగా ఉందని సూచిస్తుంది. అందుబాటులో ఉన్న భాస్వరం కంటెంట్ హెక్టారుకు 17.1 నుండి 15.9 కిలోల మధ్య ఉంటుంది. తిద్వారా అందుబాటులో ఉన్న పొస్పరస్‌లో నేలలు మధ్యస్థంగా ఉన్నాయని సూచిస్తుంది. ఈ నేలల్లో లభ్యమయ్యే పొటాషియం కంటెంట్ 167.3 నుండి 204 కిలోల/హెక్టార్ల మధ్య ఉంటుంది, తిద్వారా మీడియం నుండి అధిక పొటాషియం కంటెంట్ ఉంటుంది. సేంద్రీయ కార్బన్ 0.49 % నుండి 0.73 % వరకు

మారుతుంది. తద్వారా సేలలు తక్కువ నుండి మధ్యస్థ సెన్సిటివ్ కార్బన్ కలిగి ఉన్నాయని సూచిస్తుంది.

- గాలిలో కాలుష్య కారకాల వికాగ్రత అనుమతించదగిన పరిమితి కంటే తక్కువగా ఉంది (PM10: 18.3-49.3 µg/m3; PM2.5: 9.9-26.9 µg/m3; NOx: 7.5-18.3 µg/m3) మరియు SO2: 5-7.4 µg /m3 ఈ ప్రాంతంలో పరిశ్రమలు లేనందున మరియు వాహనాల ట్రాఫిక్ సాంద్రత ఆందోళన కలిగించదు.
- శబ్దం సర్వేక్షణ పగలు మరియు రాత్రి సమయ శబ్ద స్థాయిలు నిర్దేశిత పరిమితుల్లో ఉన్నాయని చూపిస్తుంది.
- విశ్లేషణ పలితాలను బోత్తు ఉపరితల జలాలు, క్లాస్-సి కొరకు సహనం పరిమితులతో పోల్చారు. పేహాచ్ విలువలు 7.60-8.16 మధ్య ఉన్నాయి మరియు అనుమతించదగిన పరిమితిలో ఉన్నాయి (6.5-8.5). TDS స్థాయిలు 151 నుండి 248 mg/l వరకు ఉంటాయి మరియు కావాల్సిన పరిమితి 500 mg/l కంటే తక్కువగా ఉన్నాయి. ఉపరితల నీటి నమూనాలలో క్లోరైడ్స్ స్థాయి 24.6 నుండి 50 mg/l వరకు ఉంటుంది మరియు కావాల్సిన పరిమితి 250 mg/l కంటే తక్కువగా ఉంది. సల్ఫేట్ల స్థాయి 18.5 నుండి 37.2 mg/l వరకు ఉంటుంది మరియు కావాల్సిన పరిమితి 200 mg/l కంటే తక్కువగా ఉంది. నైట్రేట్ స్థాయి 2.6 నుండి 4.1 mg/l మధ్య ఉంటుంది మరియు కావలసిన పరిమితి 45 mg/l కంటే తక్కువగా ఉంటుంది. భూగర్భ జలాలు కావాల్సిన పరిమితుల్లో అన్ని పారామితులను కలిగి ఉన్నాయి.

ప్రభావాల మూల్యాంకనం:

- నిర్మాణ కార్యకలాపాల కారణంగా ప్రభావాలు వివరించబడ్డాయి. పరిసర ఉష్ణోగ్రత మరియు తేమపై తాత్కాలిక మరియు నామమాత్ర ప్రభావం ఉంటుంది. ఆపరేషన్ దశ ప్రాజెక్ట్ ప్రాంతం యొక్క వాతావరణ శాస్త్రం మరియు భేతోష్ణస్థితిపై ఎలాంటి ప్రభావాన్ని సృష్టించకపోవచ్చు.
- ఆపరేషన్ దశలో భూమి వినియోగంలో ఎటువంటి మార్పు ఆశించబడదు. తదుపరి ఉపయోగం లేని అనేక పునరావాస ప్రాంతాలు తోటల కిందకు తీసుకురాబడతాయి.
- ప్రాజెక్ట్ కార్యకలాపాల కారణంగా సేల కోత ఆపరేషన్ దశలో ఉండదు, ఎందుకంటే నిర్మాణం పూర్తవుతుంది మరియు ల్యాండ్‌స్కేప్ పునరుద్ధరణ పని కూడా అమలు చేయబడుతుంది
- ప్రాంతం యొక్క భూగర్భ శాస్త్రంపై ఊహించిన పర్యావరణ ప్రభావం యొక్క తీవ్రత బలహీనంగా ఉంటుంది మరియు ఊహించిన ప్రభావం పరిధి స్థానికంగా ఉంటుంది. ఆపరేషన్ దశలో ప్రాంతం యొక్క భూగర్భ శాస్త్రంపై ఎటువంటి ప్రభావం ఊహించబడదు.
- PRLIS వ్యవస్థ అమలు మరియు ఆపరేషన్ నుండి భూగర్భ జలాల రీచార్జ్ రిజర్వాయర్ నుండి సీపేజ్, కాలువ వ్యవస్థ నుండి నష్టాలు మరియు ఫీల్డ్ అప్లికేషన్ కారణంగా ఉంటుంది.

- నిర్మాణ దశలో గాలి నాణ్యతలో తాత్కాలిక మార్పులు వాహనాల నుండి ఉద్గారాలు మరియు బ్లాస్టింగ్ కార్యకలాపాల కారణంగా బాధిస్తున్నారు పరిసర గాలి నాణ్యతపై పరిమితంగా ప్రభావం NAAQS లో ఉంటుంది.
- నిర్మాణ దశలో మాత్రమే శబ్దం స్థాయిలలో తాత్కాలిక పెరుగుదల ఆశించబడుతుంది.
- నిర్మాణ సమయంలో నీటి వనరులపై ప్రభావం నది/ నీటి వనరులలో స్వల్పంగా గందరగోళాన్ని పెంచుతుంది, అయితే నీటి పారదర్శకత దెబ్బతినదు. భూగర్భ జలాల రీఛార్జ్ కాకుండా, మొత్తం ప్రాంతంలో భూగర్భ జలాల నాణ్యత కూడా మెరుగుపడుతుంది.
- ప్రాజెక్ట్ జోన్ యొక్క వృక్షసంపద కూర్పు విస్తృతంగా పంపిణీ చేయబడుతుంది మరియు ఆవాసాలకు గణనీయమైన నష్టం ఉండదు. ఏదైనా, ప్రాజెక్ట్ కార్యాచరణ కాలంలో ఏవైనా వృక్షసంపదను కోల్పోవడం వలన తగిన సమయంలో పునరుద్ధరించబడుతుంది. నిర్మాణానంతర దశలో ప్లాజక్ట్ ప్రాంతం యొక్క పుష్ప సమృద్ధి అనేక రెట్లు పెరుగుతుంది. ఎందుకంటే గ్రీన్ బెల్ట్, పునరుద్ధరణ మరియు ల్యాండ్‌స్కేపింగ్ కింద ప్లాంటేషన్ పూర్తవుతుంది.
- అంతరించిపోతున్న మరియు ప్రమాదంలో ఉన్న జాతుల ప్రస్తుత ఆవాసాలలో ఎటువంటి మార్పు ఉండదు. ప్రాజెక్ట్ ప్రాంతానికి సమీపంలో వన్యప్రాణుల అభయారణ్యం, జాతీయ ఉద్యానవనం మరియు బయోస్పియర్ రిజర్వ్ కూడా లేదు.
- ప్రాజెక్ట్ కారణంగా ఎటువంటి స్థానభ్రంశం మరియు R&R లేదు. భూ సేకరణకు సంబంధించిన పరిహారం భూ సేకరణ, పునరావాసం & పునర్వ్యవస్థీకరణ (RFCTLARR) చట్టం 2013 లో న్యాయమైన పరిహారం మరియు పారదర్శకత హక్కు ప్రకారం ఇవ్వబడుతుంది.

ప్రాజెక్ట్ ప్రయోజనాలు:

కింది ప్రయోజనాలను వాటాదారులకు, పబ్లిక్ హియరింగ్‌లో ఉన్న గ్రామస్తులకు ఇంగ్లీష్ మరియు స్థానిక భాషలో వివరించారు.

- రాజెక్ట్ 4,97,976 హెక్టార్లకు సాగునీరు అందిస్తుంది. తెలంగాణ రాష్ట్రంలోని 6 జిల్లాల్లోని 1226 గ్రామాలు. 70 మండలాల్లోని భూములు.
- ఈ ప్రాజెక్ట్ 6 జిల్లాలకు మరియు హైదరాబాద్ నగరంలో కూడా సురక్షితమైన తాగునీటిని అందిస్తుంది.
- కనీసం 50 లక్షల మంది ప్రజలు తమ సాగు ప్రక్రియ కోసం సురక్షితమైన తాగునీరు మరియు నిరంతరాయ నీటిపారుదల నీటితో ప్రయోజనం పొందుతారు.
- రబీ మరియు ఖరీఫ్ సాగు ప్రక్రియ మెరుగుపడుతుంది మరియు ఉత్పాదకత మెరుగుపడుతుంది. ఎందుకంటే ప్రాజెక్ట్ ప్రభావిత ప్రాంతం కరువు కారణంగా ప్రభావితం కాదు.
- కమాండ్ ఏరియాలో భూగర్భ జలాల రీచార్జ్ మెరుగుపడుతుంది

- వ్యవసాయ ఆధారిత ఉత్పత్తులు మరియు పరిశ్రమలు వృద్ధి చెందుతాయి.
- PRLIS ప్రాజెక్ట్ నిర్మాణ ప్రక్రియలో కనీసం 7000 ఉద్యోగాల కల్పన జరుగుతుంది. ప్రాజక్ట్ నిర్మాణం మరియు ఆపరేషన్ సమయంలో పరోక్ష ఉద్యోగ ఉత్పత్తి కూడా కనిపిస్తుంది.

పై ప్రజెంటేషన్ తర్వాత కలెక్టర్ & జిల్లా మేజిస్ట్రేట్ PRLIS ప్రాజెక్ట్ గురించి తమ సూచనలు, అభిప్రాయం మరియు అభ్యంతరం తెలియజేయడానికి ప్రజలను ఆహ్వానించారు.

క్రింది వ్యక్తులు తమ అభిప్రాయాలు, సూచనలు మరియు అభ్యంతరాలు వ్యక్తం చేశారు:

1. శ్రీమతి విజిత రెడ్డి, తెర్కూరు గ్రామం: పాలమూరు జిల్లాకు, పాలూ, పెరుగూ సమృద్ధిగా లభించడం వల్ల ఆ పేరు వచ్చింది, ఇది ప్రజల గొప్పతనాన్ని ప్రతిబింబిస్తుంది. కానీ, కాలక్రమేణా జిల్లా దృక్పథం మారిపోయింది మరియు ప్రజలు జీవనోపాధి కోసం ఇతర జిల్లాలకు వలస వెళ్లడం ప్రారంభించారు, ఈ నీటిపారుదల ప్రాజెక్టులలో ఆమె పాలమూరు జిల్లా యొక్క అర్హత మరియు మరుగున జీవన శైలిని తిరిగి ఆశిస్తోంది. ఈ ప్రాజెక్ట్ పర్యావరణంపై ఎలాంటి ప్రభావం చూపదని మరియు సాధ్యమైనంత త్వరగా పూర్తి చేయాలని ఆమె కోరారు.

2. భూపతి రెడ్డి, వెలుదండ, సర్పంచ్ : ఎగ్జిక్యూటివ్ సారాంశాన్ని విన్నప్పుడు, 8 గ్రామపంచాయతీలతో కూడిన 21,404 ఎకరాల ఆయకట్టును కలిగి ఉన్న వెలుదండమండల్ తనకు అర్థమైందని ఆయన వ్యక్తం చేశారు. గత 100 సంవత్సరాలుగా కల్వకుర్తి ప్రాంతంలో అతి తక్కువ వర్షపాతం నమోదైందని ఆయన చెప్పారు. అతను ప్రాజెక్టును పొందడం అదృష్టమని మరియు మూగర్య జిల్లా రీఫార్జిని ఆశిస్తున్నట్లు ఆయన ఇంకా అభిప్రాయపడ్డారు. ప్రాజక్ట్ అధికారులను వీలైనంత త్వరగా పూర్తి చేయాలని ఆయన కోరారు. చివరగా, ఈ ప్రాజెక్ట్ పర్యావరణంపై ఎలాంటి ప్రభావం చూపదని ఆయన అభిప్రాయపడ్డారు.

3. పి. ఉస్తి రెడ్డి, వెలుదండ : ఈ ప్రాజెక్టి దశాబ్దాల కల అని ఆయన అన్నారు. సాగునీటి ప్రాజక్టులపై తాము అనేక ఆందోళనల్లో పాల్గొన్నామని ఆయన చెప్పారు. అతను ఇంకా, ప్రాజెక్ట్ అధికారులను వెల్దండమండల్‌కు నీటి రవాణా వ్యూహాన్ని సంక్షిప్తం చేయమని అభ్యర్థించాడు మరియు న్యాయమైన పరిహారం కోరారు.

4. బాలయ్య, ఎంపీ, చైర్మన్, కల్వకుర్తి : ప్రాజెక్ట్ ప్రాంతంలో ఎలాంటి స్మారక చిహ్నాలు, దేవాలయాలు మొదలైనవి లేనందున ఈ ప్రాజెక్ట్ పర్యావరణంపై ఎలాంటి ప్రభావం చూపదని ఆయన వ్యక్తం చేశారు.

5. భాస్కర రావు, వెలుదండ : కరువు పీడిత ప్రాంతంలోని భూములకు సాగునీరు అందించడానికి ఈ ప్రాజెక్ట్ ప్రతిపాదించబడిందని. ప్రాజెక్ట్‌లో ఎటువంటి దట్టమైన అడవులు, పులుల నిల్వలు, విలువైన జాతులు లేనందున ఈ ప్రాజెక్ట్ ప్రభావం చూపదని ఆయన వ్యక్తం చేశారు. ఈ ప్రాజెక్టు వల్ల భూగర్భ జలాలు పెరుగుతాయని ఆయన అన్నారు. ఇది కరువు పీడిత భూములను సస్యశ్యామలంగా మారుస్తుంది.

6. గుడువయ్య గౌడ్, సొక్స్ ఛైర్మన్, పంగూరు, వలిదండ : ఈ ప్రాజక్ట్ పర్యావరణంపై ఎలాంటి ప్రభావం చూపదని ఆయన అన్నారు. గత 100 సంవత్సరాల నుండి తెలంగాణకు నదీజలాల పంపిణీలో అన్యాయం జరుగుతోందని ఆయన అన్నారు. అతను చప్పాడు. వారికి క్షేమ, భూమి, వనరులు మొదలైనవి ఉన్నాయి, కానీ. నీరు లేదు. అందువల్ల, వారు అభివృద్ధిలో వెనుకబడి ఉన్నారు. పరిహారాన్ని వేగవంతం చేయాలని ఆయన సిపార్సు చేశారు.

7. బెజ్జ యాదయ్య గౌడ్, దారకొండ - మునుపటి ప్రభుత్వాలలో రైతులు డిప్రెషన్‌లో ఉన్నారని ఆయన వ్యక్తం చేశారు ఇప్పుడు, కొత్త ప్రభుత్వం ఏర్పడిన తరువాత మరియు కొత్త పథకాలు మరియు ప్రభుత్వ పథకాల సహాయంతో ఆర్థిక స్థితి మెరుగుపడింది మరియు వారు సంతోషంగా ఉన్నారు. ప్రభుత్వం ప్రారంభించే ఏ ప్రాజెక్టుకైనా తాను మద్దతు ఇస్తానని ఆయన వ్యక్తం చేశారు. అతను ఈ PRLIS ప్రాజెక్ట్ నుండి తాగునీటిని ఆశిస్తున్నాడు

8. పెంటు రంగా రెడ్డి (Rtd.ENC), సింగోటం గ్రామం. కొల్లాపూర్ : PRL'S లో 65 కిలోమీటర్ల టండ్ పొడవుతో రిజర్వాయర్లు ఏర్పడతాయని ఆయన వ్యక్తం చేశారు. మరియు బ్యాంకింగ్ కోసం అవసరమైన వివిధ రకాల పేలలను వివరించడానికి అతను ప్రయత్నించాడు మరియు బ్యాంకింగ్ కోసం ఈ మట్టిని ఎక్కడ నుండి సేకరించారో తెలియజేయడం అవసరం. కోస్గి వెంకటయ్య ప్రాజెక్టు వినియోగం కోసం తెలంగాణ ప్రాంతంలో మట్టి తవ్వకాలకు సంబంధించి హైకోర్టులో కేసు వేశారు. కేసు గురించి క్లుప్తంగా ఆయన మాట్లాడుతూ, బ్లాక్ కాటన్ మట్టిని బ్యాంకింగ్ కోసం ఉపయోగించాలని చెప్పారు. ఇంకా, ఈ డ్రెడ్జింగ్ ప్రక్రియ ట్యాంకులు వాని పూర్తి సామర్థ్యానికి నిల్వ చేయడానికి పరోక్షంగా సహాయపడుతుందని మరియు అక్కడ రిజర్వాయర్ బండ్ ఏర్పడటానికి ఉపయోగించడం ద్వారా సహాయపడుతుందని ఆయన పేర్కొన్నారు. కోస్గివెండటయ్య మైనింగ్ ఉపయోగించిన పదం తప్పు అని మరియు అది డ్రెడ్జింగ్ అని మరియు ఇది చాలా ఉపయోగకరంగా ఉందని ఆయన అభిప్రాయపడ్డారు. చివరగా అతను ఈ ప్రాజెక్ట్ పర్యావరణంపై తక్కువ ప్రభావాన్ని చూపుతుందని బ్రీఫ్ చేశాడు. మేము ఈ ప్రాజెక్ట్ నుండి నీటిని పొందుతాము. అక్కడ పచ్చదనం పెరగడం. వాతావరణంలో ఆక్సిజన్ స్థాయి. ఇంకా. లైఫ్ హుడ్ కూడా పెరుగుతుందని చెప్పారు.

9. అల్వాల రెడ్డి, కోట్రా : అతను PRLIS ప్రాజెక్టును ఫాస్ట్ ట్రాక్‌లో పూర్తి చేయాలని ప్రాజెక్ట్ అధికారులను అభ్యర్థించాడు మరియు భూమిని వదిలించుకునే వారికి న్యాయమైన పరిహారాన్ని ప్రకటించాలని కూడా అభ్యర్థించాడు.

10. పర్వత రెడ్డి : అతను తన ప్రాంతంలో ఇంతకు ముందు వర్షాలు లేవని, దిగుబడి లేదని గ్రహించానని చెప్పాడు. కానీ, ఒకసారి వారు KLI ద్వారా నీటిని పొందారు, అతను సంవత్సరానికి 200 శ్యంటాళ్ల దిగుబడిని పొందాడు. అతను ఇంకా, KLIS యొక్క నాగిలాబ్లూ D 82 వరకు నీటిని విడుదల చేయాలని అభ్యర్థించాడు ప్రాజెక్ట్ ఫాస్ట్ ట్రాక్‌లో పూర్తి చేయాలని ఆయన ప్రాజెక్ట్ అధికారులను అభ్యర్థించాడు. అలాగే భూమిని వదిలించుకునే వారికి న్యాయమైన పరిహారం అందించాలని డిమాండ్ చేశారు

11. ఎడ్ల సత్యం, వైరీ పర్సన్, మున్సిపల్ కౌన్సిల్, కల్వకుర్తి : మహబూబ్‌నగర్ జిల్లాలోని మిడ్జిల్ (ని) లో గతంలో కనిష్ట వర్షపాతాలు నమోదయ్యాయని ఆయన చెప్పారు. ఒకసారి వారు KLI కాలువ ద్వారా నీటిని పొందారు, వారు మంచి వర్షపాతం పొందుతున్నారు. పర్యావరణం సమతుల్యంగా ఉందని అతను తెలిపాడు.

12. బాలాజీ సింగ్ ZP సైస్ ఛైర్మన్ : పర్యావరణంలో గాలి, నీరు, నేల, జంతువులు మొదలైనవి ఉంటాయి. కానీ ఈ ప్రాజక్ట్ వీటిలో దేనిపైనా ప్రభావం చూపదని ఆయన వ్యక్తం చేశారు. అందువల్ల, పర్యావరణంపై ఎలాంటి ప్రభావం చూపలేదు. ఇంకా, ప్రాజెక్ట్ అధికారులను వీలైనంత త్వరగా పూర్తి చేయాలని అభ్యర్థించారు. అలాగ భూమిని కోల్పోయిన వారికి పరిహారాన్ని వంటసీ విడుదల చేయమని కోరాడు.

13. నారాయణ, మంగూర్: ఏ ప్రాజెక్టులోనూ భూమిని కోల్పోయిన వారికి పరిహారం చెల్లించలేదని ఆయన వ్యక్తం చేశారు. కాబట్టి, అది విడుదల చేయాలని అభ్యర్థించారు. ఇంకా, PRLIS ప్రాజెక్టుతో, పర్యావరణంపై ఎలాంటి ప్రభావం ఉండదని చెప్పారు.

14. ఎ. విజయ్, లింగారెడ్డిపల్లె : భూమిని వదులుకునే వారికి ఎలాంటి పరిహారం చెల్లించలేదని ఆయన వ్యక్తం చేశారు. వీలైనంత త్వరగా పరిహారం చెల్లించాలని ఆయన కోరారు. PRLIS ప్రాజెక్టుతో పర్యావరణంపై ఎలాంటి ప్రభావం ఉండదని మరింత వ్యక్తం చేశారు.

15. వి. శంకర్ నాయక్, కల్యాణి తండా : భూనిర్వాసితులకు పరిహారం చెల్లించలేదని ఆయన వ్యక్తం చేశారు ఇంకా, PRLIS ప్రాజెక్టుతో, పర్యావరణంపై ఎలాంటి ప్రభావం ఉండదని చెప్పారు.

16. సుదర్శన రెడ్డి: ఏదైనా ప్రాజెక్టులో కొన్ని మెరిట్‌లు మరియు డీమెరిట్‌లు ఉంటాయని ఆయన వ్యక్తం చేశారు. ల్యాండ్ లూజర్‌లకు ముందస్తు పరిహారం విడుదల చేయాలని మరియు ప్రాజెక్ట్ అధికారులు ఆలస్యం చేయవద్దని అభ్యర్థించారు.

17. పి. రాములు, చెర్లఇటిక్యాల : PRLIS పర్యావరణంపై ఎలాంటి ప్రభావం చూపదని ఆయన వ్యక్తం చేశారు. అలాగే భూమి సరిహద్దును త్వరగా విడుదల చేయాలని అభ్యర్థించారు.

18. మోతిలాల్, రామాయిపల్లి : అతను తన బాల్యం నుండి PRLIS ప్రాజెక్ట్ గురించి వింటున్నట్లు అతను వ్యక్తం చెశాడు. ఇప్పటికే పనులు జరుగుతున్నాయి. ఇంకా, ఈ ప్రాజెక్టుతో పర్యావరణంపై ఎలాంటి ప్రభావం ఉండదు.

19. శేఖర్ రెడ్డి, కల్వకుర్తి : ఏఆర్ఎమ్‌ఆర్ కెనాల్ అలైన్‌మెంట్ కల్వకుర్తి మీదుగా వెళుతోందని, అది పట్టణంలో పట్టా భూములను ప్రభావితం చెస్తోందని తనకు తెలిసిందని ఆయన వ్యక్తం చేశారు. కాలువను డీ-రూట్ చేయాలని మరియు సమీపంలోని ప్రభుత్వ భూముల గుండా వెళ్లేలా దూడాలని ఆయన అభ్యర్థించారు.

20.పోతుగంటి భరత ప్రసాద్, TPTC : అతను EIA, EMP బుక్లెట్ల ద్వారా పెర్కొన తర్వాత ప్రజలలో అవగాహన పొందాలని సూచించాడని ఆయన వ్యక్తం చేశారు. వ్యవసాయం కోసం ఉపయోగకరమైన మట్టిని మరియు రిజర్వాయర్ ప్రయోజనం కోసం పనికిరాని మట్టిని మళ్లించాలని ఆయన సూచించారు EMP బుక్‌లెట్‌లలో పేర్కొన్న భూ పరిహారం రావడానికి దత్తత తీసుకున్న రేటును సరిచూసుకోవాలని ఆయన సూచించారు. ఇంకా, ఈ ప్రాంతంలోని వివిధ ప్రాజెక్టుల కారణంగా పచ్చదనం 23%పరిగిందని ఆయన తెలియజేశారు. ప్రాజెక్ట్ కోసం విపత్తు నిర్వహణ ప్రణాళికను చేయాలని ఆయన అభ్యర్థించారు.

21. శ్రీ. జైపాల్ యాదవ్, గౌరవనీయులైన ఎమ్మెల్యే : బచావత్ ట్రిబ్యునల్ ద్వారా తెలంగాణ మరియు ఏపీకి నీటి కేటాయింపుల గురించి ఆయన వివరించారు. జీవనోపాది కోసం మహబూబ్‌నగర్ నుండి దాదాపు 15 లక్షల మంది వలస వచ్చారని, రాబోయే ప్రభుత్వాలతో ప్రజల రివర్స్ మైగ్రేషన్ కోసం కోరుకుంటున్నారని ఆయన ఇంకా వ్యక్తం చేశారు. 2012-13 సంవత్సరంలో శ్రీ. కిరణ్ కుమార్, గౌరవనీయులు, ముఖ్యమంత్రి ఈ ప్రాజెక్ట్ సర్వే కోసం 7.5 కోట్లు మంజూరు చేశారు 2014 లో, గౌరవనీయులైన పీఎమ్ తన తెలంగన పర్యటనలో AP లో పోలవరం ప్రాజెక్ట్ వలె PRLIS ప్రాజెక్ట్ నుండి జాతీయ సంపదలకు హోమీ ఇచ్చారు.

పబ్లిక్ హియరింగ్ ప్రక్రియలను ఆబ్జెక్టివ్ చేస్తున్నప్పుడు, ఒకొరంగా విచారణను సజావుగా నిర్వహించడానికి మరియు వారి అభిప్రాయాలు, సూచనలు మరియు అభిప్రాయాలను వ్యక్తం చేసినందుకు కలెక్టర్ ప్రజలకు ధన్యవాదాలు తెలిపారు విచారణకు సంబంధించిన అన్ని ప్రొసీడింగ్‌లు రికార్డ్ చేయబడ్డాయి మరియు పర్యావరణ క్లియరెన్స్‌కు సంబంధించి తదుపరి అవసరమైన చర్యల కోసం ప్రభుత్వానికి తెలియచేసారు.

జెసిఇఎ, టిఎస్‌పిసిబి పబ్లిక్ హియరింగ్ ప్రక్రియలను సంగ్రహించేటప్పుడు, సమాచార మరియు వీడియో రికార్డ్ చేసిన మినిట్స్ తదుపరి చర్య తీసుకోవడానికి భారత ప్రభుత్వానికి పంపబడుతుందని తెలియచేసారు

జెసిఇఇ, టిఎస్‌పిసిబి ద్వారా సానుకూల గమనిక మరియు ధన్యవాద ఓటుతో పబ్లిక్ హియరింగ్ ముగిసింది.

10.08.2021 న జరిగిన పబ్లిక్ హియరింగ్‌లో 2 ప్రాతినిధ్యాలు స్వీకరించబడ్డాయి.

పబ్లిక్ హియరింగ్‌లో పాల్గొన్న అధికారులు మరియు ప్రజల జాబితా జోడించబడింది.

బాయింట్ చీఫ్ ఎన్విరాన్‌మెంటల్ ఇంజనీర్,	కలెక్టర్ & బెల్లా మేజిస్ట్రేట్, నాగర్ కర్నూల్
TSPCB, జోనల్ ఆఫీస్, హైదరాబాద్	బెల్లా

గ్రామస్థులు, ఎన్‌జిఓస్ & సబ్లిక్ రిప్రజెంటేటివ్స్ ప్రియర్ మరియు ఎపిహెచ్ నుండి రిప్రెసెన్టేన్స్ అందుకున్నారు.

క్రమసంఖ్య	సమర్పించినవారు	ప్రాతినిధ్యం స్వీకరించిన తేది	విషయము యొక్క ప్రాతినిధ్యం
సర్వశ్రీ			
1.	పర్యావరణ కాలుష్య నియంత్రణ అవగాహన సంఘం	10.08.2021	ప్రాజెక్టుకు మద్దతు ఇచ్చారు
2.	మానవ వనరుల & వికలాంగుల సంక్షేమ సంఘం, సరూర్‌నగర్	10.08.2021	ప్రాజక్టుకు మద్దతు ఇచ్చారు

Public Hearing Attendance Sheet

Nalgonda

ENVIRONMENTAL PUBLIC HEARING

Palamuru - Rangareddy Lift Irrigation Scheme [Phase-II]
248
Distributaries & Minors of the Project are passing in Nalgonda District

Sl.No.	Name of the Panel Members	Signature
1.	Sri Prashanth Jeevan Patil, IAS. Collector & District Magistrate, Nalgonda.	T Patil 10/8/21.
2.	Sri B. Rajender, EE, TSPCB, Regional Office, Nalgonda.	B. Rajender

Other officials

1.	Sri K. Gopi Ram, RDO, Devarakonda.	
2.	Sri. T. Ravinder, AES, TSPCB, R/o, Nalgonda.	
3.	Dr. S. Purushotham Reddy, AES TSPCB, R/o, Nalgonda.	
4.	Smt. S. Saraswathi, Tahasildar, Kondamallepally (M),	
5.	Smt. Ch. Vishalakshi, Tahasildar, Chinthapally (M).	

Venue: At Janapriya Gardens [Function Hall], Devarakonda Road, Kondamallepally (V & M), Nalgonda District.

Date: 10-08-2021 Time: 11 AM.

No.	Name of the Public Representative	Signature

PRLIS, I&CAD Department.

1. Sri MA Hameed Khan, CE, PRLIS, Nagarkurnool.
2. Sri R. Ravinder, EE, (PRLIS) Nagarkurnool.
3. Sri R. Satyanarayana Goud, DEE, PRLIS, Nagarkurnool.

Consultant:

1. Dr. Ashish Rawat, Sr. Manager, M/s. Voyants Solutions (P) Ltd. 10/08/21

పబ్లిక్ వినికిడి సమావేశం

యాలమంది - రంగారెడ్డి ప్రాంతీయ కార్యాలయం [2వ దశ] కొలువలసిన

250

POLLUTION CONTROL BOARD
Regional Office
Nalgonda
NALGONDA DIST.

నల్లగొండ పట్టణం

క్ర.సం.	పేరు / హోదా	గ్రామం	సంతకం
1	T. Hussain Naidu NGO	Mellacheru	
2)	జిడిమెట్ల రవీందర్ NGO	Nalgonda	
3)	కొడిదల రాములు NGO	NALGONDA	
4.	V. కృష్ణ	వర్కాల	
5	శేషు	కమ్మగూడెం	
6	మంగమ్మ	"	
7.	Krishna Reddy	Varkala	
8	K. Venkat Reddy	Varkala	
9.	వెల్లంపల్లి కృష్ణారావు	Kurmed	
10.	సాలయ్య	"	
11.	T. Shekar	Kurmed	
12	ఎవల్లందమ్మ	కొత్తపల్లిగుట్ట	
13	వెంకటేశం		
14	మాకోలు		
15	K. యాదయ్య	పాలేరు	
16	V. Kumar	Kurmedu	
17	S. Sriny	Kurmedu	
18	K Lalaiah	Kurmedu	
19)	N. Kumar		
20	A. ASHOK	KURMED	
21	K సంతోష్	KORMED	
22	T. Ramakrishna	Kurmed	
23	A Mahesh	Kurmedu	
24	N. Srinivas	Kurmedu	
25	K. సత్తయ్య	కుర్మేడు	
26	G. Shiva	Kurmedu	
27	K. Shekar	Kurmedu	
28	Mahesh	Kurmed	
29	Md. Chand Pasha	Kurmed	
30	A. Venkatesh	Kurmedu	
31	K Ramulu	Kurmedu	

వేదిక: జన్మభూమి గార్డెన్స్ [ ], చీమలకొండ రోడ్డు,
కొండమల్లేపల్లి గ్రామం & మండలం, నల్లగొండ జిల్లా

తేదీ: 10-08-2021, సమయం: ఉదయం 11 గంటలకు.

క్ర.సం	పేరు/సంతకం		సంతకం
32	తోట చంద్రమ్మ	నా వివరములు	
33	P Yadaiah	వ్రాసితిని	
34	Thotakuri		
35	రామ చంద్రయ్య	ఈ మనుష్యుడు	
36	Ramesh	చనిపోయిన	
37	G వెంకటయ్య	ఉయ్యాలకుంట	G వెంకటయ్య
38	[illegible]	వడ్లు చెరువులు	[illegible]
39	P పుష్పలత		P పుష్పలత
40	I పద్మావతి		AE సంతోష్
41	P Swamy	-మరియు నేను	P Swamy
42	వెంకట్ రెడ్డి	ఆ	వెంకట్ రెడ్డి
43	రామలింగం	చనిపోయిన	మాలోతు
44	M. మీనయ్య	11	గుమ్మడాపురం
45	B. సుజాత	11	B. వెంకటయ్య
46	M. భంగిలి	11	[illegible]
47	[illegible]	ఈమె నా	[illegible]
48	S. వీరన్న	కుమారుడు	
49	P Yadagiri	11	
50	P. Shiva	Kumar	P. Shiva
51	K. సురేష్	K. సురేష్	K. సురేష్
52	వెంకటేష్	రమేష్	
53	D. santhu	Kumar	D. Santhu
54	I. Sunil	Kumar	
55	M. వెంకట్	మాదనపురం	M. వెంకట్
56	A Pavan	Kumar	A Pavan
57	Kumar	Kumar	
58	BK		
59	SK. Shamshuddin		
60			వెంకట్ రెడ్డి
61			K చంద్రవత్
62			K శివ
63			Dతిరుపతయ్య

T.S. POLLUTION CONTROL BOARD
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NALGONDA DIST.

64	Ch. Kotesh		Ch.
65	Mallesh		
66	A. Mateen		A.
67		Vankdoth	T.
68	V. Ravi	Vankdoth	
69	P. Sababa	Kommapally	P. Sababa
70	B.T Yadav	Chinthapally	
71	K.	Varakala	
72			
73			
74	V. Anjaiah	Madupally	
75	G.	Madupally	
76	M. Satyanarayana	Madupally	
77	M.	"	
78	D. R T U	"	D.
79	M.	వాడపల్లి	
80		"	
81	V Vaidhehi	Vadapally	
82	Krishna. V	Vadapally	
83	M. Venkat Rathnam	"	M. V. Rath
84		"	
85		"	
86		"	
87			
88	G. Chandra Shekar	Vadapally	
89	D.	U	
90	M.	Vadapally	
91		Thakellapally	
92	G. Parameshwar	Thakellapally	
93	K. Mallesh		
94	P. Venkat reddy	Kommapally	
95		చేపకొండ	A.

T.S. POLLUTION CONTROL BOARD
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Nalgonda.
NALGONDA DIST.

96	J. [illegible]	DVR.	
97	P [illegible]	KMPL	
98	B Sarla Naik	KMPL	
99	G. Venkateswara Reddy	K. M. Pally	
100	Md. KHALED.	Chinthapalle	
101	V. Anjaneyulu	Chinthapalle	
102	A. Ashok	Chinthapalli	
103	Ch. Anjibabu.	Chinthapalli	
104	P. Hari	Chinthapally	
105	A Jangaiah	Chinthapally	
106	P [illegible]	[illegible]	
107	[illegible]	[illegible]	
108	[illegible]	[illegible]	
109	N. [illegible]	[illegible]	
110	N. [illegible]	[illegible]	
111	N. Bhasha	[illegible]	
112	K. Ramesh	[illegible]	
113	G Shekar	[illegible]	G Shekar
114	G. Shekar		
115	K. Muthyalu.		
116	K. Venkatachalam.		K. Yadaiah
117	S. [illegible]		S. S [illegible]
118	M. Nagaraju	Thallapally	
119	E. Venkatesh		E. Venkateswarlu
120	P. Naveen Kumar NGO, Tummalapalli	Nalgonda	
121	K. Krupakar NGO,	Nalgonda	
122	T. Sekhar Reddy NGO	"	
123	S. Kanakachary	Dindi	
124	D. Sylesh.	DINDI	
125	G. Venkataiah	"	
126	Md. Mynoddin.	"	
127	Palla Devender Reddy	DVK	

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S.No	పేరు	గ్రామం	సంతకం
	A.M.C		
130	N. Shanker	Cherlapalli	
131	K. Laxma	Chintapalli	
132	K. Ravi	Thakkallapalli	
133	G. Shekar	వాడపల్లి	
134	S. Praveen	2903 మిర్యా	
135	వేములు	〃	వేములు
136	Ed Palle	Endamulu	
137	B. Muthyalu	K.M. palli	
138	Jitta Jagadish	Godalavada	
139	Karkuri Nirat	Gadikallu	
140	M. Sajan	కొండకల్లు	
141	K. Venkanna	గోడుగుకల్లు	
142	M. Malleshu	గాదిరికల్లు	
143	V. Sudhakar		
144	గడ్డం వెంకటేశ్	పెద్దల	
145	పల్లె నాగయ్య	పెద్దల	
146	G. Venkateshwarlu		
147	B. Mallaiah	K.M Palli	
148			
149	R Bunny	చెన్నకేశవ తండా	R Bunny
150	R. Ramesh Nayak	చెన్నకేశవ తండా	R Ramesh Nayak
151	M. [illegible]	వాడపల్లి	M. [illegible]
152	M. Shivakrishna	Vinjamoor	M. Shivakrishna
153	కొండలు	Kondalu	
154	[illegible]	వింజమూర్	
155		వింజమూర్	
156	A. మధు	వింజమూర్	A. మధు
157	A. Sagar	〃	
158	వాకిడి [illegible]	〃	
159	A. [illegible]	〃	
160	[illegible]	〃	

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1) V. Bhaskar	Chairman	
2) [illegible]	Chief Engineer	
3) [illegible]	Secretary	
4) [illegible]	Member	
5) N. Yadaiah	"	
6) [illegible]	"	
7) A. Chandraiah	Central Rep	
8) M. Peddaiah		
9) [illegible]		
10) [illegible]		

T.S. POLLUTION CONTROL BOARD Regional Office Nalgonda. NALGONDA DIST.

1. Palla. Narsimha Reddy — EN. MPPDV.
2. Party Party Karmachari Union
3. T. Ruchi Reddy. Dinti
4. N. Giridhar Chemistry
5. Vyshnavi Chemistry
6. N Ramchandra DEE
7. D Shekar Reddy Chemistry
8. G. [illegible] Sanitary
9. V. Vidya Sagar Law "
10. B. Srinivas "
11. M. Ganesh Kothapet
12. K. Nagaraju
13. K. RAKSHITH CHAUHAN PALEM Thandra
14. N. Kishan "
15. V. Laxmaiah Varkala
16. K. Rajashekar Reddy Godekandla
17. P. Keerthi Asst Professor
18. Kondur Srinivas Godekandla
19. Ch. Srinivas Chary. Godabandla

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20			
21	GADDAM		
22			
23	P. Ramaswamy	Thakkallapally	
24	M. Ramadhar	Goud Thakkallapally	
25	B. Jangaiah	Goud. Chakalicherla Pally	
26	A		
27	Arekanti	Manjeera	Vinjamoor
28	Nimma	Chandraiah	"
29	M.		Y.G. Pally
30	R. Srinivas		Y.P.
31			
32	A. Ashok.		Chintharlapally.
33			
34			
35	A		
36			
37	G. Jangaiah		Kurmed
38			
39	P. Jangaiah		Kurmed.

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T.S. POLLUTION CONTROL BOARD
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NALGONDA DIST.

Name village Sign

62 N. వెంకటేశ్వర్లు పెద్దిపాడు

T.S. POLLUTION CONTROL BOARD
Regional Office
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Minutes of Meeting-Public Hearing

Nalgonda

Minutes of the Environmental Public Hearing held in connection with the construction of Palamuru-Rangareddy Lift Irrigation Scheme (PRLIS) Phase-II in Mahbubnagar, Nagarkurnool, Narayanpet (erstwhile Mahbubnagar), Rangareddy, Vikarabad (erstwhile Rangareddy) & Nalgonda Districts - Irrigation facility (Phase-II) Distributaries &Minors passing in Nalgonda Districtproposed by Irrigation and Command Area Development Department, Telangana State(pertaining to Nalgonda District),conducted at Jana Priya Gardens(Function Hall), Devarakonda Road, KondamallepallyVillage and Mandal, NalgondaDistrict on 10-08-2021 at 11.00 AM.

The following Public Hearing Panel Members were present:

Sl.No.	Name of the Panel Member	
1.	Sri Prashant Patil, IAS Collector & District Magistrate, Nalgonda District.	Collector & District Magistrate, Nalgonda District.
2.	Sri B. Rajender, Environmental Engineer, T.S. Pollution Control Board, Regional Office, Nalgonda.	Representative of T.S. Pollution Control Board.

The following Government Officials were also present:

Sl.No.	Name & Designation
1.	Sri K. Gopi Ram, Revenue Divisional Officer, Devarakonda, Nalgonda District.
2.	Sri T. Ravindar, Assistant Environmental Scientist, TSPCB, Regional Office, Nalgonda.
3.	Dr. S. Purushotham Reddy, Assistant Environmental Scientist, TSPCB, Regional Office, Nalgonda.

The following representatives of Irrigation& CAD Department and other officials were present:

Sl.No.	Name & Designation
1.	Sri M.A. Hameed Khan, Chief Engineer, Irrigation, Nagarkarnool
2.	Sri R. Ravinder, Executive Engineer, Irrigation Division No.3, Nagarkarnool
3.	Sri R. Satyanarayana, Dy. Executive Engineer, Irrigation Sub-Division No.1,Nagarkarnool
4.	Dr. Ashish Rawat, Consultant, M/s. Voyants Solutions Private Limited, Gurugram.

At the outset, the Environmental Engineer, TSPCB, Regional Office, Nalgonda invited the people gathered at the venue and public representatives and other officials to participate in the Environmental Public Hearing. He has also invited the Collector& District Magistrate, Nalgonda District to occupy the dais and conduct the public hearing in accordance with the procedure laid down in the Environment Impact Assessment Notification (EIA), 2006 issued by the Ministry of Environment, Forests and Climate Change, Government of India. While explaining the salient features of the EIA Notification, 2006, S. O. (E) No.1533, dated 14-09-2006 and its subsequent amendments issued from time to time, he stated that the public hearing was a mandatory process for the irrigation project. He stated that the intimation of the public hearing was published in 'Saakshi' Telugu Newspaper and in 'the New Indian Express' English Newspaper on

10-07-2021. The draft EIA &Executive Summary on the project and other relevant information was displayed in the local body offices, the Collectorate and other offices to enable the public to access the information. The present project is categorized as 'A' and the Environmental Public Hearing is being held to elicit the views, opinion, suggestions and objections, if any, on the proposed project. Those people who were not able to express their views orally, they could do so through written representations also. The doubts expressed by the people would be answered by the project proponent or their environmental consultant. He also informed that the entire proceedings would be video graphed and would be sent to the authorities for taking further action and no final verdict on the proposal would be taken during the public hearing. He then requested the Collector& District Magistrate, NalgondaDistrict to conduct the proceedings of the Public Hearing.

The Collector & District Magistrate, Nalgonda while inviting the people, public representatives, officials gathered at the venue stated that the environmental public hearing was mandatory for obtaining environmental clearance for the proposed project. He stated that this statutory public hearing was meant to elicit the views of public on impacts on environment. The people were requested to express their views without fear which would be video-graphed. They can also submit written representations. He concluded his opening speech with a request to the representative of Irrigation and Command Area Development Department, Telangana State to present the details of the project, which would be followed by the Consultants of the project to present the impacts on environment and its mitigation measures. After presentations from the consultant, he requested the people to offer their views on the environmental impacts of the project.

Sri R. Ravinder, Executive Engineer, Irrigation&CAD Department: He welcomed the gathering and explained that Palamuru-Ranga Reddy Lift Irrigation Scheme (PRLIS) is envisaged to create irrigation potential in upland and most draught prone areas in Mahabubnagar, Nagarkurnool, Narayanpet, Rangareddy, Vikarabad and Nalgonda Districts. In these districts, there is severe drought and even non-availability of water for drinking. People of these places were migrating to other places for livelihood. To overcome these difficulties, the Government of Telangana has taken up Palamuru-Ranga Reddy Lift Irrigation Scheme project and planned for lifting 90 TMC of water from foreshore of Srisailam Reservoir in 60 days with 5 stage lifting to store water in 6 online reservoirs located in 70 Mandals of 6 Districts to irrigate Ayacut of 12,30,000 Acres and drinking water for 1226 villages and industrial sector.

This project is planned in 2 phases. Phase-I involves works of approach channels and Gravity canals of length 50.49 km and tunnels of length 61.577 km and 5 pumping stations to supply water to storage in 6 reservoirs with total storage capacity of 67.97 TMC of water for consumptive use in drinking water, indusrial uses and irrigation and these works are in progress.

Phase-II involves works of 13 main canals of total length of 915 Kms and distribution network to serve 12,30,000 Acres of Ayacut from Venkatadri Reservoir, Kurmurthi Reservoir, Udanadapur Reservoir, K.P. Laxmidevipalli Reservoir.

In Nalgonda District, the PRLIS proposed system will supply water to 16 villages in 2 Mandals with proposed ayacut of 29,339 Acres from canals of Venkatadri Reservoir and K.P.Laxmidevipally Reservoir. For execution of these works, about 494 acres of land to be acquired.

This PRLIS Lift irrigation will provide direct and indirect benefits such as improvements in water table, indirect ayacut, improvements in social life status of people, it generates employment and fishing activates, benefits to economy and commerce, access to improved infrastructure facilities, it helps in tourism development and better opportunities for cattle rearing etc.

He stated that the Environmental clearance for the project is very much essential and hence requested the public to give their opinion.

Sri R. Satyanarayana, Dy. Executive Engineer, Irrigation & CADD and Dr. Ashish Rawat, Consultant, M/s. Voyants Solutions Private Limited informed the following:

- M/s. Voyants Solutions Pvt. Ltd, Gurugram, Haryana, has conducted the Environment Impact Assessment Study as per approved ToR issued by the MoEF&CC, New Delhi, vide letter dated 11.10.2017 and the TOR is valid till 10.10.2021.
- Baseline Monitoring was conducted in Monsoon season, 2019, post-monsoon season, 2019 and Pre-monsoon season, 2020.
- Existing status of Air Quality was evaluated by setting up six locations to conduct air quality monitoring in respect of PM2.5, PM10, SO2 and NOx.
- The sound level was measured at six locations by sound level meter.
- Physical and chemical characteristics of the soil were studied in respect of six samples taken from the study area.
- Samples were taken from six locations for evaluating physical, chemical and biological characteristics of surface and ground water.
- Phytosociology of plants and diversity of the forest vegetation was determined based on field survey of the area. Various transects were identified along the villages to carry out faunal studies.
- The data on socio economic was collected to gather information on public perception of the proposed project. Data was also collected from secondary sources to validate the information and to supplement the data on demographic aspects.

- Due to construction activities, there shall be temporary and nominal effect on the ambient temperature and humidity. The operation stage project may not create any impact on the meteorology and climatology of the area.
- During the operation phase no change in land use is expected. Many of the redundant areas having no further usage will be brought under plantation.
- Soil erosion due to project activities will not exist in the operation phase as the construction would be completed and landscape restoration work would also be implemented
- The intensity of anticipated environmental impact on geology of the area will be weak and extent of anticipated impact will be local. No impact is anticipated on the geology of the area during the operation phase.
- Temporary increase in noise levels are expected during construction phase only.
- The impact on water bodies during construction with the slight increase in turbidity in the river/ water bodies but the transparency of the water shall not be impaired. Apart from ground water recharge, quality of ground water will also improve in the entire area.
- The vegetation composition of the project zone is widely distributed and there will be no significant loss to the habitat. However, any loss of vegetation during the project activity period will be restored in due course of time. The floral abundance of the project area in post construction phase will increase by many folds as the plantation under green belt, restoration and landscaping will be completed.
- There will be no alteration to the existing habitat of endangered and threatened species. There is also no wildlife sanctuary, national park and biosphere reserve near the project area.
- There is no any displacement and R&R due to the Project. The Compensation for the land acquisition shall be given as per Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation & Resettlement (RFCTLARR) Act 2013 and Telangana State Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2014.
- The sources of air pollution during construction phase are from fuel combustion, emissions from crushers and vehicular movement.
- Maintenance and proper functioning construction equipment.
- Proper repair and maintenance of roads and effective traffic management.
- Regular sweeping of construction area and vicinity and water sprinkling on katcha surface / earthen roads.
- Acoustic enclosures and stacks as per CPCB norms for DG sets.

- The sewage generated from project colony and various labour camps is the source of water pollution during construction phase. It is proposed to provide STP for treatment of sewage.
- The biodegradable wastes are proposed to be processed by composting, vermin-composting. Recoverable waste for recycling.
- The green belt is proposed to be developed within the project area along both banks of main canal, service roads of distribution network and project colonies.
- Project will irrigate 4,97,976 Ha. of lands at 1226 villages, 70 mandals in 6 districts of Telangana state.
- The project will also provide safe drinking water to 6 districts and also in Hyderabad city.
- At least 50 Lakh people will be benefitted with safe drinking water and uninterrupted irrigation water for their cultivation process.
- Rabi and Khareef cultivation process will be improved and productivity will be improved, as the project impacted area will not be affected due to drought.
- Groundwater recharge in command area will be improved
- Agro based products and industries will get boosted.
- At least 7000 job generation will be made during construction process of PRLIS Project. Indirect job generation also will be witnessed during the project construction and operation.
- Will improve the social and economic life of the people in the area.

The Collector & District Magistrate, Nalgonda has requested the public to express their views one-by-one and the same will be recorded.

1. Sri Vinjamuri Ravi, R/o. Varkala: He thanked the District collector, Nalgonda for taking up of this project. He stated that his village is in the tail end and was affected with fluoride water. Due to scarcity of water, farmers of this area migrated to cities like Mumbai. The Government has taken very good project of PRLIS to improve the lives of people and thanked the government for this project, to provide water for drinking and irrigation.

2. Sri N. Giridhar, R/o. Chinthapally: While Welcoming the project he stated that they were waiting for this project for so many years and extended special thanks to the Hon'ble Chief Minister for sanctioning the PRLIS project. He has requested to reduce the capacity of existing reservoir under construction in Chintapally Mandal to 0.5 TMC so as to reduce the land area under submergence. He requested the authorities to get Environmental Clearances for the PRLIS project early and complete the project.

3. Sri G. Srinivas, Sarpanch, Nelvelapally: He stated that people are very happy with the project. The Government is already supplying drinking water from Nagarjuna Sagar project to households and now the government will supply water to irrigation with this project. He supported the project.

4. Sri Vinjamuri Krishnaiah, R/o. Varkala: While welcoming the project he has thanked the Government for taking up the project. He sought employment and good compensation to the land losers.

5. Sri Md. Chand Pasha, R/o. Kurmed: He stated that it is proud to the people of Chinthapally Mandal to get this project. He urged that compensation to the land losers may be given as per market rates.

6. Sri P. Yadaiah, R/o. Kurmapally: He stated that earlier there was water scarcity and whatever water available is floride affected. Subsequently, they got safe drinking water and now with this project, they will also get water for irrigation. He supported the project.

7. Sri Mallaiah, R/o. Chakaliseripally: He expressed that the Chakaliseripally villages will be very happy if they get the water from this project. Some of their village people are going to Hyderabad city and Miryalaguda for livelihood. He supported the project.

8. Sri D. Chandra Shekhar Reddy, R/o. Kistarampally (V), Chinthapally Mandal: He stated that the intent of Hon'ble CM is to see farmers happy by giving water to every acre of land and hence sanctioned this PRLIS project. In their village many people are affected by floride water. He requested the people to support the Government for the land acquisition. He supported the project.

9. Sri Y. Chenna Keshava Reddy, Social Activist: He welcomed the project as it is very useful to the people. He sought suitable compensation to the land losers and also permanent or temporary jobs may be provided to the land losers. Small contracts may also be given to the local people. The water taken from Srisailam project will help in fisheries development also and requested the authorities to issue Environmental Clearance at the earliest.

10. Dr. B. Ramana Naik, Chairman, Institute of Engineering-Telangana State: He stated that it is fortunate to have this project to this area. Civilisation is connected to water availability. He expected that the R&R Plan should be properly implemented.

11. Sri P. Krishnaiah, R/o, Ramnagar, Chinthapally: He raised issues related to revenue land and he welcomed the project.

12. Sri T. Hussain Naidu, NGO: He extended his fullest support to this irrigation project. He requested the authorities to take up plantation 5 time more for the plants removed during Canal

Construction. He requested the authorities to provide good compansaton to the land losers. He supported the project.

13. Sri Jeedimetla Ravinder, Environmental Activist, Nalgonda: He whole heartedly welcomed the project. On behalf of their NGO organization, they are recommending to MoEF&CC to accord Environmental Clearance to the project at the earliest. This project will also help the state government's Haritha Haram plantation Programme.

14. Sri Palla Narasimha Reddy, Ex. MPP, Devarakonda and CPI Party: He supported the project on behalf of his party. As this is a lift irrigation project and more land acquisition is not required, hence the Environmental Clearance shall be given at the earliest. He requested to implement R&R package and complete the project at the earliest. He supported the project.

15. Sri Jitta Jagadish, R/o. Godukondla (V), Chinthapally Mandal: He stated that this area is affected with drought, there was scarcity for the drinking water also. Farmers incurred huge losses by digging of bore wells for irrigation. He welcomed the irrigation project and thanked the Government.

16. Sri Masa Bhaskar, R/o. Godukondla (V), Chinthapally Mandal: He stated that the Government has taken up the PRLIS project to help the farmers. He requested the authorities to give the details of irrigation area in Chintapally Mandal. He supported the project and sought to implement the suggestions made by the public. Suitable Compensation may be given to the land losers.

17. Sri Kankanala Venkat Reddy, TRS Leader: He stated that farmers of the area migrated to Hyderabad city for lively hood. People are eagerly waiting for the PRLIS Project. Once this project is completed, all the farmers will be very happy. He expected this project is completed at the earliest and requested the authorities to issue Environmental Clearance.

18. Sri Ramesh Naik, Palem Thanda: He welcomed the project and requested that people should not worry if they lose land in view of the overall benefit of the project. He supported the project.

19. Sri Puli Raju, R/o. Godukondla (V), Chinthapally Mandal: He Stated that this area is flouride affected. He is very happy as this project will provide drinking water as well as irrigation water. He supported the project.

20. Sri Balagoni Jangaiah Goud, R/o. Chakali Seripally (V), Chinthapally Mandal: He has supported the irrigation project.

21. Sri Andekar Ashok, R/o. Kurmed (V), Chinthapally Mandal: He stated that this is a very happy moment for them and thanked the government for taking up this irrigation project. He supported the project.

22. Sri Arekanti Maisaiah: He thanked all for conducting the Public Hearing. He requested to pay suitable compensation to the land losers in the project.

23. Sri Arekanti Chandraiah, R/o. Vinjamur: He welcomed the irrigation project. He suggested that the lands in Chinthapally Mandal are very costly and hence good compensation shall be given to the farmers who lose their land for the project. The compensation has to be given at the earliest. He supported the project.

The Collector & District Magistrate, Nalgonda has requested the project officials to clarify on the issues raised by the public.

Sri R. Ravindar, EE, I&CAD, PRLIS, Nagarkarnool stated that the compensation to the land losers will be provided as per the provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation & Resettlement (RFCTLARR) Act, 2013.

The Collector and District Magistrate, Nalgonda reiterated that the entire proceedings were video-graphed and the minutes of Public Hearing meeting would be sent to the Ministry of Environment, Forests and Climate Change, GoI for taking further action and thanked the people for expressing their views and suggestions and concluded the public hearing on positive note.

Representations (4 Nos.) received in this connection are enclosed herewith.

List of the public participated in the public hearing is appended.

B. Rajender,
Environmental Engineer
T.S. Pollution Control Board
Regional Office, Nalgonda.

Prashant Patil, IAS
Collector & District Magistrate,
Nalgonda District.

Statement of representations received w.r.t. Environmental Public Hearing held in connection with the construction of Palamuru-Rangareddy Lift Irrigation Scheme (PRLIS) Phase-II in Mahbubnagar, Nagarkurnool, Narayanpet (erstwhile Mahbubnagar), Rangareddy, Vikarabad (erstwhile Rangareddy) & Nalgonda Districts - Irrigation facility (Phase-II) distributaries & minors passing in Nalgonda District proposed by Irrigation and Command Area Development Department, Telangana State (pertaining to Nalgonda District), at Jana Priya Gardens (Function Hall), Devarakonda Road, Kondamallepally Village and Mandal in Nalgonda District on 10-08-2021 at 11.00 AM.

Sl.No	Representation given by	Date of receipt	Content of the representation
1.	Sri N. Kondal, M.A, B.Ed., B.C.J., (LLB), President, Paryavarana Parirakshana Samithi, Hyderabad.	09.08.2021 (through E-mail)	He supported the proposed project.
2.	Sri M. Bachaiah, Founder & General Secretatry, Environmental Pollution Control Awareness Society, Hyderabad.	10.08.2021	He supported the proposed project.
3.	Sri M. Satyanarayana, President, Manava Vanarula & Vikalangula Sankeshama Sangam, Saroor Nagar, RR District.	10.08.2021	He supported the proposed project.
4.	Danda Kondamma Charitable Trust, Vanasthalipuram, Hyderabad.	10.08.2021	He supported the proposed project.

A. Rajender

Patil

తెలంగాణ రాష్ట్ర నీటి పారుదల మరియు కమాండ్ ప్రాంత అభివృద్ధి శాఖ వారు మహబూబ్‌నగర్, నాగర్‌కర్నూల్, నారాయణపేట (మునుపటి మహబూబ్‌నగర్), రంగారెడ్డి, వికారాబాద్ (మునుపటి రంగారెడ్డి) మరియు నల్లగొండ జిల్లాలలో ప్రతిపాదించిన పాలమూరు - రంగారెడ్డి ఎత్తిపోతల నీటిపారుదల పథకం (PRLIS) నీటి పారుదల సౌకర్యం 2వ దశ నిర్మాణానికి సంబంధించి నల్లగొండ జిల్లాలో ప్రవహించే ఉప కాలువలు మరియు చిన్న కాలువలకు సంబంధించి నల్లగొండ జిల్లా కొండమల్లేపల్లి గ్రామం మరియు మండలం, దేవరకొండ రోడ్డులోని జనప్రియ గార్డెన్స్ (ఫంక్షన్ హాల్) నందు తేది. **10-08-2021** రోజున ఉదయం **11.00** గంటలకు జరిగిన పర్యావరణ ప్రజాభిప్రాయ సేకరణ యొక్క మినిట్స్ (పూర్తి వివరములు).

ఈ క్రింది పేర్కనబడిన ప్రజాభిప్రాయ ప్యానెల్ సభ్యులు హాజరైనారు :

క్రమ సంఖ్య	ప్యానెల్ సభ్యుల పేరు	అధికారిక హోదా
1.	శ్రీ ప్రశాంత్ పాటిల్, ఐ.ఎ.ఎస్. కలెక్టర్ & జిల్లా మేజిస్ట్రేట్, నల్లగొండ.	కలెక్టర్ & జిల్లా మేజిస్ట్రేట్, నల్లగొండ.
2.	శ్రీ బి. రాజేందర్, పర్యావరణ ఇంజినీర్, తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి, ప్రాంతీయ కార్యాలయము, నల్లగొండ.	తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి యొక్క ప్రతినిధి

ఈ క్రింది పేర్కొన్న ప్రభుత్వ అధికారులు కూడా సభకు హాజరు అయినారు :

క్రమ సంఖ్య	పేరు మరియు హోదా
1.	శ్రీ కె. గోపి రామ్, రెవెన్యూ డివిజనల్ అధికారి, దేవరకొండ, నల్లగొండ జిల్లా.
2.	శ్రీ టి. రవీందర్, సహాయక పర్యావరణ సైంటిస్ట్, తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి, ప్రాంతీయ కార్యాలయం, నల్లగొండ.
3.	డాక్టర్ ఎస్.పురుషోత్తం రెడ్డి, సహాయక పర్యావరణ సైంటిస్ట్, తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి, ప్రాంతీయ కార్యాలయం, నల్లగొండ.

ఈ క్రింది పేర్కొన్నబడిన నీటిపారుదల మరియు ఆయకట్టు అభివృద్ధి శాఖ మరియు ఇతర అధికారులు హాజరైనారు :

క్రమ సంఖ్య	పేరు మరియు హోదా
1.	శ్రీ యం.ఎ. హమీద్ ఖాన్, చీఫ్ ఇంజనీరు, నీటిపారుదల శాఖ, నాగర్‌కర్నూలు.
2.	శ్రీ ఆర్.రవీందర్, కార్యనిర్వాహక ఇంజనీరు, నీటిపారుదల విభాగం-3, నాగర్‌కర్నూలు.
3.	శ్రీ ఆర్. సత్యనారాయణ, డిప్యూటి కార్య నిర్వాహక ఇంజనీరు, నీటిపారుదల ఉప-విభాగం, నెం.1, నాగర్ కర్నూలు.
4.	డా. ఆశిష్ రావత్, కన్సల్టెంట్ (సలహాదారు), మెస్సర్స్ వోయంట్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్, గురుగ్రాం.

ప్రారంభంలో, పర్యావరణ ఇంజనీర్, తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి, ప్రాంతీయ కార్యాలయం, నల్లగొండ గారు సభ స్థలం వద్ద ఉన్న ప్రజలను, సభ్యులను, ప్రజా ప్రతినిధులను మరియు ఇతర అధికారులను పర్యావరణ ప్రజాభిప్రాయ సేకరణ సభలో పాల్గొనుటకు ఆహ్వానించారు. అతను, కలెక్టర్ & జిల్లా మేజిస్ట్రేట్, నల్లగొండ గారిని వేదికను అలంకరించి ప్రజాభిప్రాయ సేకరణ సభను పర్యావరణ, అటవీ మరియు వాతావరణ మార్పు మంత్రిత్వ శాఖ, భారత ప్రభుత్వము వారిచే పొందుపరచబడిన (EIA) నోటిఫికేషన్, 2006 S.O. నెం. 1533 తేది. 14-09-2006 యొక్క ప్రముఖ లక్షణాలను వివరిస్తూ మరియు దాని తదుపరి, సమయానుకూలంగా చేసిన సవరణలు, నియమనింబంధనల ప్రకారము నిర్వహించమని కోరినారు. నీటి పారుదల ప్రాజెక్ట్ కొరకు ప్రజాభిప్రాయ సేకరణ తప్పనిసరి ప్రక్రియ అని ఆయన పేర్కొనారు. ప్రజాభిప్రాయ సేకరణ గురించిన సమాచారం సాక్షి తెలుగు వార్తా దినపత్రికలో మరియు న్యూ ఇండియన్ ఎక్స్‌ప్రెస ఆంగ్ల వార్తా దినపత్రికలో తేది. 10-07-2021 రోజున ప్రచురించబడిందని ఆయన పేర్కొన్నారు. ప్రాజెక్ట్ మరియు ఇతర సంబంధిత సమాచారంపై ముసాయిదా పర్యావరణ ప్రభావ అంచనా మరియు కార్యనిర్వాహక సారాంశం ప్రజలకు సమాచారం అందుబాటులో ఉండేలా స్థానిక సంస్థ కార్యాలయాల, కలెక్టరేట్ మరియు ఇతర కార్యాలయాలలో ప్రదర్శించబడినది. ప్రస్తుత ప్రాజెక్ట్ 'ఎ'గా వర్గీకరించబడింది మరియు ప్రతిపాదిత ప్రాజెక్ట్‌పై ఏమైనా ఆక్షేపణలు, అభిప్రాయాలు, సలహాలు, సూచనలు మరియు అభ్యంతరాలు ఉన్న యెడల వాటిని తెలుసుకోవడానికి పర్యావరణ ప్రజాభిప్రాయ సేకరణ నిర్వహించబడుతుంది. మౌఖికంగా తమ అభిప్రాయాలను వ్యక్తం చేయలేని వ్యక్తులు వ్రాతపూర్వకంగా కూడా వారి అభిప్రాయాలను, సూచనలను, సలహాలను తెలియచేయవచ్చును. ప్రజలు వ్యక్తం చేసిన సందేహాలకు ప్రాజెక్ట్ ప్రతిపాదకుడు మరియు వారి పర్యావరణ సలహాదారు సమాధానం ఇస్తారు. మొత్తం ప్రక్రియ వీడియోగ్రాఫ్ చేయబడునని మరియు తదుపరి చర్యల కోసం పై ఉన్నతాధికారులకు పంపబడును అని ఈ ప్రజాభిప్రాయ సేకరణ సమయంలో మాత్రం తుది నిర్ణయం తీసుకోబడదని కూడా వారు తెలియచేశారు. ఆ తర్వాత, ప్రజాభిప్రాయ సేకరణ

ప్రక్రియను నిర్వహించవలసిందిగా జిల్లా కలెక్టర్ మరియు జిల్లా మెజిస్ట్రేట్ గారిని వారు అభ్యర్థించారు.

గౌరవ కలెక్టర్ మరియు జిల్లా మేజిస్ట్రేట్, నల్లగొండ వారు సమావేశానికి హాజరైన ప్రజలను, ప్రజా ప్రతినిధులను మరియు అధికారులను ఆహ్వానిస్తూ ప్రతిపాదిత ప్రాజెక్ట్ పర్యావరణ అనుమతి పొందుటకు పర్యావరణ ప్రజాభిప్రాయ సేకరణ తప్పనిసరి అని పేర్కొన్నారు. ఈ చట్టబద్ధమైన ప్రజాభిప్రాయ సేకరణ, ప్రతిపాదిత ప్రాజెక్ట్ మరియు పర్యావరణం పై ప్రజల అభిప్రాయాలను తెలుసుకోవడానికి ఉద్దేశించినదని ఆయన పేర్కొన్నారు. ప్రజలు తమ అభిప్రాయాలను భయం లేకుండా వ్యక్తం చేయవచ్చునని మరియు అట్టి అభిప్రాయాలను వీడియోగ్రాఫ్ చేయబడునని ప్రజలను అభ్యర్థించారు. ప్రజలు నేరుగా వారి అభిప్రాయాన్ని వ్యక్తం చేయలేని వారు వ్రాతపూర్వకమైన ప్రాతినిధ్యాలను కూడా సమర్పించవచ్చునని ఆయన తెలియజేశారు. తెలంగాణ రాష్ట్ర నీటి పారుదల మరియు ఆయకట్టు అభివృద్ధి శాఖ ప్రతినిధికి ప్రాజెక్ట్ వివరాలను సమర్పించాలని, అ తర్వాత పర్యావరణ సలహాదారులు పర్యావరణంపై ప్రభావాలను మరియు ఉపశమన చర్యలను తెలియచేయవలసిందిగా అభ్యర్థించడంతో వారు తన ప్రారంభ ప్రసంగాన్ని ముగించారు. సలహాదారుని ప్రసంగం తరువాత, ప్రాజెక్ట్ యొక్క పర్యావరణ ప్రభావాలపై తమ అభిప్రాయాలను అందించవలసిందిగా ప్రజలను అభ్యర్థించారు.

శ్రీ ఆర్. రవీందర్, కార్యనిర్వాహక ఇంజనీరు, నీటిపారుదల మరియు ఆయకట్టు అభివృద్ధి శాఖ : ఈ సమావేశానికి హాజరైన ప్రజలను, ప్రజాప్రతినిధులను పాలమూరు - రంగారెడ్డి ఎత్తిపోతల నీటిపారుదల పథకంలోని మహబూబ్‌నగర్, నాగర్‌కర్నూల్, నారాయణపేట, రంగారెడ్డి, వికారాబాద్ మరియు నల్లగొండ జిల్లాలలోని ఎగువ ప్రాంతాలలో నీటి పారుదల సామర్థ్యాన్ని పెంచడానికి పాలమూరు - రంగారెడ్డి ఎత్తిపోతల నీటిపారుదల పథకం (PRLIS) రూపొందించబడింది. ఈ జిల్లాలో తీవ్రమైన కరువు ఉంది మరియు త్రాగునీటికి కూడా నీరు అందుబాటులో లేదు. ఈ ప్రాంతాల ప్రజలు జీవనోపాధి కొరకు ఇతర ప్రాంతాలకు వలస పోతున్నారు. ఈ ఇబ్బందులను అధిగమించడానికి, తెలంగాణ ప్రభుత్వం పాలమూరు-రంగారెడ్డి ఎత్తిపోతల పథకం చేపట్టింది, మరియు 6 జిల్లాల్లో 70 మండలాలలో 6 ఆన్‌లైన్ జలాశయాల ద్వారా 5 దశల ఎత్తిపోతల ద్వారా 12,30,000ల ఎకరాల ఆయకట్టు విస్తీర్ణం, 1226 గ్రామాలలోని పారిశ్రామిక రంగానికి మరియు త్రాగునీటి కోసం దశల వారీగా ఎత్తిపోతలతో శ్రీశైలం జలాశయం నుండి 60 రోజుల్లో 90 టిఎంసిల నీటిని ఎత్తిపోయుటకు ప్రణాళిక రూపొందించబడింది. ఈ ప్రాజెక్టును రెండు దశలలో నిర్మాణం చేపట్టుటకు ప్రణాళిక సిద్ధం చేయబడింది. దీనిలో భాగంగా మొదటి దశలో అప్రోచ్ చానెల్స్ మరియు 50.49 కిలోమీటర్ల పొడవు గల గ్రావిటి కాలువలు మరియు 61.577 కిలోమీటర్ల పొడవు గల సొరంగాల ద్వారా 5 పంప్‌హౌజ్‌ల ద్వారా 6 జలాశయాలలో మొత్తం 67.97 టిఎంసిల నీటిని త్రాగునీటికోసం, పారిశ్రామిక ఉపయోగం మరియు సాగు నీటిపారుదల కొరకు నీటిని కొరకు నీటిని సరఫరా చేయుటకు ప్రణాళిక సిద్ధం చేయబడింది.

ఈ ప్రాజెక్టు యొక్క 2వ దశలో 915 కిలోమీటర్ల పొడవుగల 13 ప్రధాన కాలువలు మరియు పంపింగ్ వ్యవస్థ కలిగి ఉంటుంది. తద్వారా వెంకటాద్రి జలాశయం, కురుమూర్త జలాశయం, ఉదానాదాపూర్ జలాశయం, కె.పి. లక్ష్మీదేవిపల్లి జలాశయాల నుండి 12,30,000ల ఎకరాల ఆయకట్టుకు సరఫరా చేయబడును.

నల్లగొండ జిల్లాలో ప్రతిపాదిత పాలమూరు-రంగారెడ్డి ఎత్తిపోతల పథకంలోని వెంకటాద్రి జలాశయం మరియు కె.పి.లక్ష్మీదేవిపల్లి జలాశయాల కాలువల నుండి 2 మండలాలల్లో 16 గ్రామాలకు నీటి సరఫరాను మరియు 29,339 ఎకరాల ఆయకట్టుకు నీరు అందిస్తుంది. ఈ పనుల అమలు కోసం 494 ఎకరాల భూమిని సేకరించవలసి ఉంది.

ఈ పాలమూరు - రంగారెడ్డి ఎత్తిపోతల పథకం ద్వారా నీటి పట్టిక, ఆయకట్టు అభివృద్ధి, సాంఘిక జీవనం మరియు ప్రజల జీవన స్థాయిలో వృద్ధి, ఉపాధి మరియు మత్స్య కార్యకలాపాలు, ఆర్థిక మరియు వాణిజ్య ప్రయోజనాలు, మెరుగైన మౌలిక సదుపాయాల కల్పన, పర్యాటక అభివృద్ధి మరియు పశువుల పెంపకానికి మెరుగైన అవకాశాలు వంటి ప్రత్యక్ష మరియ పరోక్ష ప్రయోజనాలను కల్పించస్తుంది.

ప్రాజెక్ట్ కొరకు పర్యావరణ అనుమతి అత్యంత అవసరమని, కావున ప్రజలు తమ అభిప్రాయాన్ని తెలియజేయవలసిందిగా వారు కోరినారు.

శ్రీ ఆర్. సత్యనారాయణ, డిప్యూటీ కార్యనిర్వాహక ఇంజనీరు, నీటిపారుదల మరియు ఆయకట్టు ప్రాంత అభివృద్ధి శాఖ మరియు డా. ఆశిష్ రావత్, సలహాదారు మెస్సర్స్ వాయెంట్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్ వారు ఈ క్రింది విషయాలను తెలియచేశారు.

- మెస్సర్స్ వాయెంట్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్, గురుగ్రాం, హర్యానా వారు పర్యావరణ, అటవీ మరియు వాతావరణ మార్పు మంత్రిత్వ శాఖ వారి ఆమోదిత సూచన నిబంధనలు తేది. 11-10-2012 మరియు తేది. 10-10-2021 వరకు అమలులో ఉన్న సూచన నిబంధనలను అనుసరించి ఒక పర్యావరణ ప్రభావ అంచనా అధ్యయనం నిర్వహించింది.
- 2020 సంవత్సరపు వర్షాకాలానికి ముందు, 2019 సంవత్సరపు వర్షాకాలంలో మరియు 2019 సంవత్సరపు వర్షాకాలం తరువాత ఒక ఆధార రేఖ పర్యవేక్షణ జరిగింది.
- PM 2.5, PM 10, SO2 మరియు NOx లకు సంబంధించి గాలి నాణ్యత పర్యవేక్షణను నిర్వహించడానికి ఆరు ప్రదేశాలను ఏర్పాటు చేయడం ద్వారా గాలి నాణ్యత యొక్క ప్రస్తుత స్థితిని అంచనా వేశారు.
- ధ్వని స్థాయి పరికరం ద్వారా ధ్వని స్థాయిలను ఆరు ప్రదేశాలలో కొలువబడెను.
- అధ్యయన ప్రాంతం నుండి సేకరించబడిన ఆరు మట్టి నమూనాల భౌతిక మరియు రసాయన లక్షణాలను అధ్యయనం చేయబడెను.

- ఉపరితల మరియు భూగర్భ జలాల భౌతిక, రసాయన మరియు జీవ లక్షణాలను విశ్లేషించడానికి ఆరు ప్రదేశాల నుండి నమూనాలను తీసుకోబడ్డాయి.
- ఈ ప్రాంతం యొక్క క్షేత్ర సర్వే ఆధారంగా మొక్కల వృక్ష సాంఘిక శాస్త్రం మరియు అటవీ వృక్ష సంపద యొక్క వైవిధ్యం నిర్ధారించబడ్డాయి. జంతుజాల అధ్యయనాలను నిర్వహించడానికి గ్రామాల వెంబడి వివిధ మార్గాలు గుర్తించబడ్డాయి.
- ప్రతిపాదిత ప్రాజెక్ట్ యొక్క ప్రజా అవగాహనపై సమాచారాన్ని సేకరించడానికి సామాజిక ఆర్థిక సమాచారం సేకరించబడింది. సమాచారాన్ని ధృవీకరించుటకు మరియు జనాభా అంశాలపై సమాచారాన్ని భర్తీ చేయబడడానికి ద్వితీయ మూలాల నుండి కూడా సమాచారం సేకరించబడింది.
- నిర్మాణ కార్యకలాపాల వలన, పరిసర ఉష్ణోగ్రత మరియు తేమపై తాత్కాలిక మరియు నామమాత్రపు ప్రభావం ఉంటుంది. ప్రాజెక్ట్ యొక్క ఉపయోగ దశలో ఈ ప్రాంతంలోని వాతావరణం మరియు శీతోష్ణస్థితిపై ఎలాంటి ప్రభావాన్ని కలిగించకపోవచ్చును.
- ఈ ప్రాజెక్ట్ యొక్క ఉపయోగ దశలో భూ వినియోగంలో ఎటువంటి మార్పు ఊహించబడలేదు. తదుపరి, ఉపయోగం లేని అనేక పునరావృత ప్రాంతాలు తోటల క్రిందకు తీసుకురాబడతాయి.
- ఈ ప్రాజెక్ట్ కార్యకలాపాల కారణంగా జరిగే నేల కోత ఉపయోగ దశలో ఉండదు, ఎందుకనగా, నిర్మాణం పూర్తి అవగానే భూమి పునరుద్ధరణ పనులు కూడా అమలు చేయబడును.
- ఈ ప్రాంతం యొక్క భాగర్భ శాస్త్రంపై ఊహించిన పర్యావరణ ప్రభావం యొక్క తీవ్రత బలహీనంగా ఉంటుంది మరియు ఊహించని ప్రభావం పరిధి స్థానికంగా ఉండును. ఉపయోగ దశలో ప్రాంతాల భూగర్భ శాస్త్రంపై ఎటువంటి ప్రభావం ఉండదు.
- నిర్మాణ దశలో మాత్రమే శబ్దం సాయిలో తాత్కాలిక పెరుగుదల అంచనా వేయబడింది.
- నది / నీటి వనరులో స్వల్పంగా పెరిగిన సంక్షుబ్ధంతో (Turbidity) నిర్మాణ సమయంలో నీటి వనరులపై ప్రభావం ఉంటుంది. కాని నీటి పారదర్శకత దెబ్బ తినదు. భూగర్భ జలాల పునరావృతం కాకుండా, మొత్తం భూగర్భ జలాల నాణ్యత కూడా మెరుగుపడుతుంది.
- ప్రాజెక్ట్ జోన్ యొక్క వృక్ష సంపద కూర్పు విస్తృతంగా పంపిణీ చేయబడును మరియు ఆవాసాలకు గణనీయమైన నష్టం ఉండదు. అయినప్పటికీ, ప్రాజెక్ట్ కార్యాచరణ కాలంలో ఏదైనా వృక్ష సంపదను కోల్పోవడం జరిగిన యెడల అట్టి వృక్ష సంపద పునరుద్ధరించబడును. నిర్మాణ దశలో ప్రాజెక్ట్ ప్రాంతం యొక్క పుష్ప సమృద్ధి అనేక రెట్లు

పెరుగును, కారణం ఏమిటంటే హరిత హారం క్రింద మొక్కల నాటుట మరియు పచ్చని వృక్ష సంపద గల భూమి పునరుద్ధరించబడుతుంది.

- అంతరించిపోతున్న మరియు ప్రమాదంలో ఉన్న జాతుల ప్రస్తుత ఆవాసాలలో ఎటువంటి మార్పు ఉండదు. ప్రాజెక్ట్ ప్రాంతంలో వన్యప్రాణుల అభయారణ్యం, జాతీయ ఉద్యానవనం మరియు జీవగోళ నిల్వలు కూడా లేవు.
- ప్రాజెక్ట్‌కు సంబంధించిన స్థానభ్రంశం, పునరావాస మరియు పునఃపరిష్కార బకాయిలు / సమస్యలు ఏమీ లేవు. భూసేకరణకు సంబంధించిన పరిహారం భూసేకరణ, పునరావాసం మరియు పురావాస చట్టం 2013లోని మరియు తెలంగాణ రాష్ట్ర భూసేకరణ, పునరావాసం మరియు పునర్వవస్తీకరణ నియమాలు 2014లోని న్యాయమైన పరిహారం మరియు పారదర్శకత హక్కు ప్రకారం ఇవ్వబడును.
- నిర్మాణ దశలో వాయు కాలుష్యం యొక్క మూలాలు ఇంధన, దహన, క్రషర్లు మరియు వాహనాల కదలికల ద్వారా అయి ఉన్నాయి.
- నిర్వహణ మరియు సరియైన పనితీరు గల నిర్మాణ పరికరాలు.
- రోడ్ల సరియైన మరమ్మత్తు మరియు నిర్వహణ మరియు సమర్థవంతమైన ట్రాఫిక్ (రద్దీ) నిర్వహణ.
- నిర్మాణ ప్రాంతం మరియు పరిసరాలను క్రమం తప్పకుండా తుడుచుకోవడం మరియు కచ్చా ఉపరితల మట్టి రోడ్లపై నీరు చల్లడం.
- డీజిల్ జనరేటర్ సెట్ల శబ్ద ఆవరణలు మరియు స్టాక్ అమరికలు కేంద్ర కాలుష్య నియంత్రణ మండలి నియమాలను అనుసరించి ఉండును.
- ప్రాజెక్ట్ యొక్క నిర్మాణ దశలో ప్రాజెక్ట్ కాలనీ మరియు వివిధ కార్మిక శిబిరాల నుండి ఉత్పత్తి చేయబడిన మురుగు నీరు నీటి కాలుష్యానికి మూలం అవుతుంది. మురుగు నీరు శుద్ధి కోసం మురుగు నీటి శుద్ధి కర్మాగారం ఏర్పాటు చేయుటకు ప్రతిపాదించబడింది.
- జీవశైధిల్య వ్యర్థాలను కంపోస్టింగ్, వర్మికంపోస్టింగ్ మరియు రీసైక్లింగ్ కొరకు పునరావృత వ్యర్థాల ప్రక్రియల ద్వారా తీసివేయబడుటకు ప్రతిపాదించబడెను.
- ప్రాజెక్ట్ ప్రాంతంలో ప్రధాన కాల్వ యొక్క రెండు ఒడ్డులన ఉన్న ప్రాజెక్ట్ ప్రాంతం, పంపిణీ నెట్‌వర్క్ యొక్క మరియు ప్రాజెక్ట్ కాలనీల సర్వీస్ రోడ్లతో సహా అభివృద్ధి చేయాలని ప్రతిపాదించబడింది.
- ఈ ప్రాజెక్ట్ తెలంగాణ రాష్ట్రంలోని 6 జిల్లాల్లో ఉన్న 70 మండలాలకు చెందిన 1226 గ్రామాలలోని 4,97,976 హెక్టార్ల భూమికి సాగు నీరు అందిస్తుంది.

- ఈ ప్రాజెక్ట్ పూర్తి అయిన తరువాత తెలంగాణ రాష్ట్రంలోని 6 జిల్లాలకు మరియు హైదరాబాద్ నగరానికి కూడా సురక్షిత త్రాగునీటిని అందిస్తుంది.
- కనీసం 50 లక్షల మంది ప్రజలు తమ తాగు మరియు సాగునీటి ప్రక్రియ కొరకు సురక్షితమైన త్రాగునీరు మరియు నిరంతరాయ సాగు నీటితో ప్రయోజనం పొందుతారు.
- ప్రాజెక్ట్ ప్రభావిత ప్రాంతాలు కరువునకు ప్రభావితం కానందున, రబీ మరియు ఖరీఫ్ సాగు ప్రక్రియ మెరుగుపడుతుంది మరియు ఉత్పాదకత మెరుగుపడుతుంది.
- ఆయకట్టు ప్రాంతంలో భూగర్భ జలాల పునరావృత్తం మెరుగుపడుతుంది.
- వ్యవసాయ ఆధారిత ఉత్పత్తులు మరియు పరిశ్రమలు వృద్ధి చెందుతాయి.
- ఈ పాలమూరు - రంగారెడ్డి ప్రాజెక్ట్ నిర్మాణ ప్రక్రియ సమయంలో కనీసం 7,000 ఉద్యోగాల కల్పన జరుగుతుంది.
- ప్రాజెక్ట్ నిర్మాణ మరియు ఉపయోగ సమయంలో పరోక్ష ఉపాధి కూడా లభించును.
- ఈ ప్రాజెక్ట్ వలన ఈ ప్రాంతంలోని ప్రజల సామాజిక మరియు ఆర్థిక జీవితాలు మెరుగు పడతాయి.

నల్లగొండ జిల్లా కలెక్టర్ మరియు జిల్లా మెజిస్ట్రేట్ గారు ప్రజలు ఒక్కొక్కరిగా వచ్చి వారి వారి అభిప్రాయాలను తెలియజేయవలసిందిగా ప్రజలను కోరినారు మరియు అట్టి అభిప్రాయాలను రికార్డ్ చేయబడునని కూడా తెలియచేసినారు.

1) **శ్రీ వింజమూరి రవి, నివాసం - వర్కాల :** ఈ ప్రాజెక్ట్‌ను చేపట్టినందులకు నల్లగొండ జిల్లా కలెక్టర్ గారికి ధన్యవాదాలు తెలిపినారు. తన గ్రామం చివరిలో ఉండుట వలన ఫ్లోరైడ్ నీటి వలన ప్రభావితం అయిందని, నీటి యెద్దడి వలన ఈ ప్రాంతానికి చెందిన రైతులు ముంబాయి వంటి నగరాలకు వలస వెళ్ళిపోతున్నారని, ఈ ప్రాంతంలో ఉండే ప్రజల జీవితాలను మెరుగుపరుచుటకు పాలమూరు-రంగారెడ్డి ఎత్తిపోతల ప్రాజెక్ట్ ఎంతగానో ఉపయోగపబడుతుందని, ఈ ప్రాంతానికి సాగు నీరు మరియు త్రాగు నీరు అందించుటకు ప్రభుత్వం పూనుకొన్నందుకు అట్టి ప్రాజెక్ట్‌ను చపట్టిన ప్రభుత్వానికి తన కృతజ్ఞతలు తెలియచేశారు.

2) **శ్రీ యన్. గిరిధర్, నివాసం - చింతపల్లి :** ఈ ప్రాజెక్ట్‌ను స్వాగతిస్తూ ఈ ప్రాజెక్ట్ కొరకు వారు ఎంతో కాలంగా ఎదురు చూస్తున్నామని మరియు ఇట్టి పాలమూరు-రంగారెడ్డి ఎత్తిపోతల ప్రాజెక్ట్‌ను చేపట్టినందుకు గౌరవ ముఖ్యమంత్రికి ప్రత్యేక కృతజ్ఞతలు తెలియజేసినారు. అయితే, ముంపు ప్రాంతాన్ని తగ్గించుటకు చింతపల్లి మండలంలో ఇప్పుడున్న జలాశయం యొక్క సామర్థ్యం 0.5 టి.యం.సి.లకు తగ్గించాలని ప్రభుత్వాన్ని అభ్యర్థించారు. సదరు పాలమూరు-రంగారెడ్డి ఎత్తిపోతల ప్రాజెక్ట్‌కు పర్యావరణ

అనుమతిని త్వరగా మంజూరు చేసి ఈ ప్రాజెక్టును సత్వరగా పూర్తి చేయాలని అభ్యర్థించారు.

3) **శ్రీ జి. శ్రీనివాస్, సర్పంచ్ - నెల్వెలపల్లి :** ఈ ప్రాజెక్ట్‌తో ప్రజలు సంతోషంగా ఉన్నారని ఆయన చెప్పారు. ఇప్పటికే ప్రభుత్వం ఈ ప్రాంతానికి నాగార్జునసాగర్ నుండి నిర్వాసితులకు నీటి సరఫరా చేస్తుంది మరియు ఇప్పుడు ప్రభుత్వం ఈ ప్రాజెక్ట్ ద్వారా సాగు నీరు కూడా సరఫరా చేస్తుంది. అతను ఈ ప్రాజెక్ట్‌కు మద్దతు పలికారు.

4) **శ్రీ వింజమూరి కృష్ణ, నివాసం - వర్కాల :** ఈ ప్రాజెక్ట్‌ను అహ్వానిస్తూ ఈ ప్రాజెక్ట్‌ను చేపట్టినందుకు ప్రభుత్వానికి కృతజ్ఞతలు తెలియచేశారు. అతను భూమి కోల్పోయినవారికి మంచి పరిహారం మరియు ఉపాధి లభించాలని కోరారు.

5) **శ్రీ మహమ్మద్ చాంద్ పాషా, నివాసం - కుర్మేడు :** ఈ ప్రాజెక్ట్ చింతపల్లి మండల ప్రజలకు గర్వకారణమని చెప్పారు. భూమి కోల్పోయిన వారికి మార్కెట్ ధర ప్రకారం పరిహారం ఇవ్వవలసిందిగా కోరారు.

6) **శ్రీ పి. యాదయ్య, నివాసం - కురంపల్లి :** ఇంతకు ముందు నీటి యెద్దడి ఉండేదని మరియు లభించిన నీటిలో కూడా ఫ్లోరైడ్ శాతం అధికంగా ఉండేదని చెప్పారు. తరువాత, వారికి రక్షిత త్రాగు నీరు లభించిందని మరియు ఇప్పుడు ఈ ప్రాజెక్ట్ ద్వారా సాగు నీరు కూడా వస్తుందని తన మద్ధతు తెలియజేశారు.

7) **శ్రీ మల్లయ్య, నివాసం - చాకలి శేరిపల్లి :** ఈ ప్రాజెక్ట్ నుండి నీరు వచ్చిన యెడల చాకలి శేరిపల్లి గ్రామ ప్రజలు సంతోషంగా ఉంటారని తెలిపారు. మా గ్రామలోని కొంత మంది ప్రజలు నీటి యెద్దడి వలన జీవనోపాది కొరకు హైదరాబాద్ నగరం మరియు మిర్యాలగూడెంలకు వలస వెళ్ళుచున్నారని చెప్పారు. ఆయన ఈ ప్రాజెక్ట్‌కు తన మద్దతు తెలియజేశారు.

8) **శ్రీ డి. చంద్రశేఖర్ రెడ్డి, నివాసం - కిస్టారాంపల్లి గ్రామం, చింతపల్లి మండలం :** ఈ ప్రాంతంలోని రైతులకు ప్రతి ఎకరానికి నీటిని అందించుట ద్వారా రైతులందరిని సంతోషంగా ఉంచాలనే సదుద్దేశ్యంతో మన గౌరవ ముఖ్యమంత్రి గారు ఈ ప్రాజెక్ట్‌ను చేపట్టారు అని చెప్పారు. వారి గ్రామంలో నీటిలో ఉన్న ఫ్లోరైడ్ వలన కలిగే దుష్ప్రభావాలకు గురి అయినారని చెప్పారు. అందువలన ఈ ప్రాజెక్ట్ కొరకు భూసేకరణ విషయంలో ప్రభుత్వానికి సహకరించవలసిందిగా అందరినీ కోరినారు.

9) **శ్రీ వై. చెన్నకేశవరెడ్డి, సామాజికవేత్త :** ఈ ప్రాజెక్ట్ ప్రజలకు ఎంతగానో ఉపయోగపడు తుందనే ఉద్దేశ్యంతో ఈ ప్రాజెక్ట్‌ను ఆహ్వానించారు. భూమి కోల్పోయిన వారికి సరియైన నష్ట పరిహారం మరియు శాశ్వత లేక తాత్కాలిక ఉద్యోగాలు కల్పించాలని కోరారు. స్థానిక ప్రజలకు చిన్న చిన్న కాంట్రాక్టులు కూడా ఇవ్వవలసిందిగా కోరారు. శ్రీశైలం ప్రాజెక్ట్

నుండి తీసుకునే నీటి నుండి మత్స్య పరిశ్రమ కూడా అభివృద్ధి చేయవచ్చునని కావున ఈ ప్రాజెక్ట్‌కు సత్వరంగా పర్యావరణ అనుమతి మంజూరు చేయాలని అధికారులను కోరారు.

10) **దా. వి. రమణ నాయక్, చైర్మన్ – తెలంగాణ రాష్ట్ర ఇంజనీరింగ్ సంస్థ :** ఈ ప్రాంతంలో ఈ ప్రాజెక్ట్ రావడం ఈ ప్రజల అదృష్టం అని చెప్పారు. నాగరికత నీటి లభ్యతకు అనుసంధానమైనది. పునరావాస మరియు పునఃపరిష్కార ప్రణాళిక సరియైన విధంగా అమలు జరపాలని ఆయన కోరారు.

11) **శ్రీ పి. కృష్ణయ్య, నివాసం – రామ్‌నగర్, చింతపల్లి :** ఆయన రెవెన్యూ భూమికి సంబంధించిన సమస్యలను లేవనెత్తారు మరియు ఈ ప్రాజెక్ట్‌ను అహ్వానించారు.

12) **శ్రీ టి. హుస్సేన్ నాయుడు, యన్.జీ.ఓ. :** ఈ నీటి పారుదల ప్రాజెక్ట్‌కు తన పూర్తి మద్దతును ప్రకటించారు. కాల్వ నిర్మాణం సమయంలో నిర్మాలించిన చెట్ల సంఖ్య కంటే 5 రెట్లు మొక్కలను నాటాలని ఆయన సూచించారు. భూములు కోల్పోయిన వారికి సరియైన పరిహారం ఇవ్వవలసిందిగా ప్రభుత్వాన్ని కోరినారు మరియు ఆయన ఈ ప్రాజెక్ట్‌కు తన పూర్తి మద్దతు ప్రకటించారు.

13) **శ్రీ జీడిమెట్ల రవీందర్, పర్యావరణ వేత్త, నల్లగొండ :** యన్.జీ.ఓ. సంఘం నుండి ఈ ప్రాజెక్ట్‌కు తమ పూర్తి మద్దతును తెలియజేశారు. కేంద్ర ప్రభుత్వ పర్యావరణ అటవీ మరియు వాతావరణ మార్పు మంత్రిత్వ శాఖ వారిని ఈ ప్రాజెక్ట్ కొరకు పర్యావరణ అనుమతి త్వరగా మంజూరు చేయవలసిందిగా కోరినారు. ఈ ప్రాజెక్ట్ వలన రాష్ట్ర ప్రభుత్వం యొక్క హరిత హారం కార్యక్రమానికి ఎంతగానో ఉపయోగపడుతుందని చెప్పారు.

14) **శ్రీ పల్లా నరసింహారెడ్డి, మాజీ యం.పి.పి., దేవరకొండ మరియు సి.పి.ఐ. పార్టీ :** తమ పార్టీ తరఫున ఈ ప్రాజెక్ట్‌కు మద్దతు తెలిపినారు. ఇది ఎత్తిపోతల నీటిపారుదల ప్రాజెక్ట్ అయినందున ఎక్కువ భూ సేకరణ అవసరం లేదు. కావున, త్వరగా పర్యావరణ అనుమతి ఇవ్వవలసిందిగా కోరినారు. పునరావాస మరియు పునఃపరిష్కార ప్యాకేజ్ ప్రక్రియ పూర్తి చేసి ఈ ప్రాజెక్ట్‌ను త్వరగా పూర్తి చేయవలసిందిగా కోరినారు. ఈ ప్రాజెక్ట్‌కు తమ మద్దతు తెలిపినారు.

15) **శ్రీ జిట్టా జగదీష్ నివాసం – గోడుకొండ్ల గ్రామం, చింతపల్లి మండలం :** ఈ ప్రాంతం కరువునకు గురి అయినందు వలన త్రాగు నీటి యెద్దడి ఏర్పడిందని మరియు నీటిపారుదల కొరకు రైతులు బోర్-బావులను త్రవ్వించుట వలన అధిక నష్టానికి గురి అయినారని అందువలన ఈ ప్రాజెక్ట్‌ను ఆహ్వానిస్తున్నానని మరియు ప్రభుత్వానికి తమ ధన్యవాదాలు తెలిపినారు.

16) **శ్రీ మాసా భాస్కర్, నివాసం - గోదుకొండ్ల గ్రామం, చింతపల్లి మండలం :** ఈ ప్రాంతం రైతులకు సహాయం చేయుటకు ప్రభుత్వం ఈ పాలమూరు-రంగారెడ్డి ప్రాజెక్ట్‌ను చేపట్టిందని చెప్పారు. చింతపల్లి మండలంలోని నీటి పారుదల ప్రాంతం వివరాలు సమర్పించవలసిందిగా అధికారులను కోరారు. ఆయన ఈ ప్రాజెక్ట్‌కు తన మద్దతు తెలియజేశారు మరియు ఈ ప్రాజెక్ట్ నిర్మాణం కొరకు ఇచ్చిన సలహాలు మరియు సూచనలను అమలు పరచవలసిందిగా మరియు భూమి కోల్పోయిన వారికి సరైన పరిహారం ఇవ్వవలసిందిగా కోరారు.

17) **శ్రీ కనకాల వెంకటరెడ్డి, బి.ఆర్.యస్. పార్టీ నాయకులు :** ఈ ప్రాంతం రైతులు అనేక మంది తమ జీవనోపాధి కొరకు హైదరాబాద్ నగరానికి వలస వెళ్ళినారని అందు వలన ఈ పాలమూరు-రంగారెడ్డి ప్రాజెక్ట్ కొరకు ఎంతగానో ఆసక్తితో ఎదురు చూస్తున్నారని తెలిపినారు. ఈ ప్రాజెక్ట్ పూర్తి అయితే రైతులందరూ సంతోషంగా ఉంటారు. ఈ ప్రాజెక్ట్‌ను త్వరతగా పూర్తి చేయవలసిందిగా మరియు పర్యావరణ అనుమతి త్వరగా మంజూరు చేయవలసిందిగా అధికారులను కోరారు.

18) **శ్రీ రమేష్ నాయక్, పాలెం తండా :** ఆయన ఈ ప్రాజెక్ట్‌ను స్వాగతించారు మరియు భూమి కోల్పోయిన నిర్వాసితులను అధైర్య పడవద్దని ఎందుకంటే ఈ ప్రాజెక్ట్ యొక్క ప్రయోజనాలు అనేకం ఉన్నాయని చెప్పారు. ఈ ప్రాజెక్ట్‌కు తన మద్దతు తెలియచేసినారు.

19) **శ్రీ పులి రాజు, నివాసం - గోదుకొండ్ల గ్రామం, చింతపల్లి మండలం :** ఈ ప్రాంతం ఫ్లోరైడ్ ప్రభావిత ప్రాంతం. ఈ ప్రాజెక్ట్ వలన సాగు నీరు మరియు త్రాగు నీరు కూడా లభిస్తుందని తన సంతోషాన్ని తెలియజేసినారు. ఈ ప్రాజెక్ట్‌కు తన మద్దతు తెలిపారు.

20) **శ్రీ బాలాగోని జంగయ్య గౌడ్, నివాసం - చాకలి శేరిపల్లి గ్రామం, చింతపల్లి మండలం :** ఈ సాగునీటి ప్రాజెక్ట్‌ను ఆయన సమర్థించారు.

21) **శ్రీ అందేకర్ అశోక్, నివాసం - కుర్మేడ్ గ్రామం, చింతపల్లి మండలం :** ఈ సందర్భం వారికి ఎంతో సంతోషకరమైనదని మరియు ఈ ప్రాజెక్ట్ చేపట్టినందున ప్రభుత్వానికి కృతజ్ఞతలు తెలియజేశారు. ఈ ప్రాజెక్ట్‌కు తన మద్దతు తెలియజేశారు.

22) **శ్రీ ఆరేకంటి మైసయ్య :** ఈ ప్రజాభిప్రాయ సేకరణ కార్యక్రమాన్ని నిర్వహించినందుకు అందరికి తన కృతజ్ఞతలు తెలియచేసినారు. ఈ ప్రాజెక్ట్ వలన భూమి కోల్పోయిన వారికి సరియైన పరిహారం ఇవ్వవలసిందిగా కోరినారు.

23) **శ్రీ ఆరేకంటి చంద్రయ్య, నివాసం - వింజమూరు :** ఈ నీటిపారుదల ప్రాజెక్ట్‌ను వారు స్వాగతించారు. చింతపల్లి మండలంలోని భూములు చాలా ఖరీదైనవని, కావున భూమి కోల్పోయిన రైతులందరికీ మంచి నష్ట పరిహారం చెల్లించాలని కోరినారు. నష్ట పరిహారం త్వరగా రైతులకు ఇవ్వాలని కోరినారు మరియు ఈ ప్రాజెక్ట్‌కు తన మద్దతు తెలిపినారు.

కలెక్టర్ మరియు జిల్లా మేజిస్ట్రేట్, నల్లగొండ వారు ఈ ప్రాజెక్ట్‌కు సంబంధించి ప్రజలు లేవనెత్తిన సమస్యలకు సమాధానం ఇవ్వవలసిందిగా ప్రాజెక్ట్ అధికారులను కోరినారు.

శ్రీ ఆర్. రవీందర్, కార్యనిర్వాహక ఇంజనీరు, నీటిపారుదల మరియు ఆయకట్టు అభివృద్ధి, పాలమూరు - రంగారెడ్డి ఎత్తిపోతల నీటిపారుదల పథకం, నాగర్‌కర్నూలు మాట్లాడుతూ 2013వ సంవత్సరపు పరిహారం భూసేకరణ, పునరావాసం మరియు పునరావాస చట్టంలోని నియమాలను అనుసరించి భూమి కోల్పోయినవారికి నష్ట పరిహారం మంజూరు చేయబడును అని తెలిపినారు.

కలెక్టర్ మరియు జిల్లా మేజిస్ట్రేట్, నల్లగొండ వారు మాట్లాడుతూ తదుపరి చర్య చేపట్టుట కొరకు పూర్తి కార్యక్రమం యొక్క వీడియో మరియు ప్రజాభిప్రాయ సేకరణ యొక్క మినిట్స్‌ను కేంద్ర ప్రభుత్వ పర్యావరణ, అటవీ మరియు వాతావరణ మార్పు మంత్రిత్వ శాఖకు పంపబడునని మరియు ఈ ప్రాజెక్ట్‌కు సంబంధించి తమ అభిప్రాయాలను తెలియచేసి సహకరించినందుకు ప్రజలకు కృతజ్ఞతలు తెలియజేశారు.

ఈ విషయంపై స్వీకరించబడిన (4) ప్రాతినిధ్యాలు ఇందువెంట జతపర్చనైనది.

ఈ ప్రజాభిప్రాయ సేకరణ కార్యక్రమంలో పాల్గొన్న ప్రజల జాబితా ఇందువెంట జతపర్చనైనది.

బి. రాజేందర్
పర్యావరణ ఇంజనీర్,
తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి,
ప్రాంతీయ కార్యాలయం, నల్లగొండ.

ప్రశాంత్ పాటిల్, ఐ.ఎ.యస్.
కలెక్టర్ మరియు జిల్లా మేజిస్ట్రేట్,
నల్లగొండ.

తెలంగాణ రాష్ట్ర నీటి పారుదల మరియు కమాండ్ ప్రాంత అభివృద్ధి శాఖ వారు మహబూబ్‌నగర్, నాగర్‌కర్నూల్, నారాయణపేట (మునుపటి మహబూబ్‌నగర్), రంగారెడ్డి, వికారాబాద్ (మునుపటి రంగారెడ్డి) మరియు నల్లగొండ జిల్లాలలో ప్రతిపాదించిన పాలమూరు - రంగారెడ్డి ఎత్తిపోతల నీటిపారుదల పథకం (PRLIS) నీటి పారుదల సౌకర్యం 2వ దశ నిర్మాణానికి సంబంధించి నల్లగొండ జిల్లాలో ప్రవహించే ఉప కాలువలు మరియు చిన్న కాలువలకు సంబంధించి నల్లగొండ జిల్లా కొండమల్లేపల్లి గ్రామం మరియు మండలం, దేవరకొండ రోడ్డులోని జనప్రియ గార్డెన్స్ (ఫంక్షన్ హాల్) నందు తేది. 10-08-2021 రోజున ఉదయం 11.00 గంటలకు జరిగిన పర్యావరణ ప్రజాభిప్రాయ సేకరణకు సంబంధించి స్వీకరించిన ప్రాతినిధ్యాల పట్టిక.

క్రమ సంఖ్య	ప్రాతినిధ్యం ఇచ్చినవారు	స్వీకరించిన తేది	ప్రాతినిధ్యం యొక్క విషయం
1.	శ్రీ యన్. కొండల్, యం.ఎ., బి.ఎడ్., బి.సి.జె., (యల్.యల్.బి.), అధ్యక్షుడు, పర్యావరణ పరిరక్షణ సమితి, హైదరాబాద్.	09-08-2021 (ఈ-మెయిల్ ద్వారా)	అతను ప్రతిపాదిత ప్రాజెక్ట్‌కు మద్దతు ఇచ్చినారు.
2.	శ్రీ యం. ఐచ్చయ్య, వ్యవస్థాపకుడు మరియు సాధారణ కార్యదర్శి, కాలుష్య నియంత్రణ అవగాహన సంఘం, హైదరాబాద్.	10-08-2021	అతను ప్రతిపాదిత ప్రాజెక్ట్‌కు మద్దతు ఇచ్చినారు.
3.	శ్రీ యం. సత్యనారాయణ రెడ్డి, అధ్యక్షుడు, మానవ వనరుల మరియు వికలాంగుల సంక్షేమ సంఘం, సరూర్‌నగర్, రంగారెడ్డి జిల్లా.	10-08-2021	అతను ప్రతిపాదిత ప్రాజెక్ట్‌కు మద్దతు ఇచ్చినారు.
4.	శ్రీ దండా కొండమ్మ ధార్మిక ట్రస్ట్, టి. సుంకేసుల గ్రామం, యర్రగుంటల ఆర్.యస్. మండలం, వై.యస్.ఆర్. కడప జిల్లా, ఆంధ్రప్రదేశ్.	10-08-2021	అతను ప్రతిపాదిత ప్రాజెక్ట్‌కు మద్దతు ఇచ్చినారు.

B. Rajesh

బి. రాజేందర్
పర్యావరణ ఇంజనీర్,
తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి,
ప్రాంతీయ కార్యాలయం, నల్లగొండ.

IAS Patil

ప్రశాంత్ పాటిల్, ఐ.ఎ.యస్.
కలెక్టర్ మరియు జిల్లా మేజిస్ట్రేట్,
నల్లగొండ.

Public Hearing Attendance Sheet

Narayanpet

Sl NO	Name and Designation of the official	Signature
①	Harichandana Dasari IAS collector and District Magistrate Narayanapet District.	
②	Addl collector (L.B)	
③	R.D.O. & SDM Narayanpet Division	
④	Zp Siddiramappa CEO, ZP	
5.	Kumar Pathak, EE, Head Offg, TSPCB, Hyd.	
6.	Bhaskar reddy. G AES. RO-Hyd, TSPCB	

Sl No	Name, ~~Phone and Designation~~	Village	Signature
1	Abdul Jaglir T.O	Nar Pet	
2	~~Anjaneyulu~~ J.T.O 9885440	Mahabubnagar	
3	K. Srinivasulu AEE, 7680072573	Kosgi	
4	T.M. yellaiah DEE, 9701862426	NRPT	
5	B. Sivanand AE 7093604065	NRPT (Dharwada)	
6	G. Kiran kumar, D.E.E, 7331180511	Dharwada (m)	
7	G. Kethan Kumar DEE 7093604063	Makthal (M)	
8	A. Aukhtar WPC 452 9666083281	Narayanpet	
9	K. Kalavathu WPC 437 8520971485	Narayanpet	
10	Mohammed Ahmed DEE 8500047571	NRPT	
11	K. Bhaskar EE, DN.3. Kodangal, 7680072534,	Kodangal	
12	S. Venkataiah EE, Boinpalli Narayanpet	Narayanpet	
13	Narasaram Golla, Retd, 9492716017		
	AAE Elec 9866234256	Narayanpet	
14	D. Sambaiah CE (R&B). 8008889109,	Hyd.	
15	K. Vittal Rao EE(R&B) 9700002479	Hyd	
16	K. Murali DPO NIPL 9505590650		
17	పెంచల్ రెడ్డి ఎస్ఎస్ఎ ఇంజనీర్ ; GS/JREA	NRP	
18	Abu siddiq Hag Ahmed khan DY.EE	9963819074.	
	Irrigation Dept. 9440903216	Mahabubnagar	
19	Khaja Ziauddin. 9441741035	Utkoor	
20	P. Adele PC 7901155410	Narayanpet	
21	G. Ravi PC 7901155228	Narayanpet	
22	Chand Basha PC 9705432362	NRPT	
23	Thirumalesh Gond PC 9490144856	NRPT	
24	G. Shivakumar, AE 7321183035	Mahabubnagar	
25	B. Harish, AEE 7331180522	MBNR	
26	T. Ramesh. AE 7331183077	MBNR	
27	P. Prabhakar Reddy DEE 7631183042	MBNR	
28	Vijayanandar Reddy DEE 7331183043	MBNR.	
29	G. Rajendra PRO 7331183072	MBNR	
30	K. Laxmi Narayana 7331183067	MBNR	
9	Sadiq Ali P.T 9440153357	MBNR	
32	Srinivas 8074539433	N.R.P.T	

Sl No.	Name	village	Signature
33	Sri N. Shivadharmaiah, SE/223/Mabth	Mabth	
34	R. Dayanand, Executive Engineer, Irrigation Division-I, Mahabubnagar	Mahabubnagar	
35	Arvind Dubey, Sr. Manager, Vayants Solutions Pvt. Ltd.	Gurgaon, Haryana	

Sl NO.	Name	village	Signature
①	V. Thirupathaiah 9441367091	Tirumalagiri	
(2)	TAJUDDIN ZPTC Cooption member Nang 8885720441	[illegible]	
(3)	Siddivadappa Dy sarpanch Collapally 9966861288	Collapally	
(4)	M. Damodar Reddy MPTC I. Kollapally 9885033873	Kollapally	
(5)	Srinivas Reddy ABangapur	ABangapur	
6)	S. Sai Reddy (V) serivenkatapur	serivenkatapur	
(7)	K. Anjaneyulu Gadlapalli	Gadlapalli	
8	Balaiyastain 9172678716	S. Vi. Pur	
9.	K. Ramakrishna - 8142165820	Abhangapatnam	
10.	P. Laxmi Narayana Gaud 8500330872	Koilkonda	
11)	T. Gopal (wife) Sheenapally-MPTC. 9666[illegible]	Sheenapally	
12)	Akil Kumar naik	Ramapuram Tanda	
13)	Anjaiah (సర్పంచ్) 6300889952	నవాబ్	
14)	G. Anjaneyulu (ఉప సర్పంచ్) 9502201451.	Ananthapur	
15)	K. Hanumathu 7893767189	Anthapur	
16)	K. pavan kalyan 8317585220	Gaddapalli	
17)	Siddappa 9949350065	Singaram	
18)	Thimmappa	Singaram	
19.	తిరుమలయ్య - 9398865339.	తిరుమలాపూర్	
20.	రాజునాయక్ తండా MPTC 9398865339.	మేకనాకనేతండా	
21	K. Ramulu 9440301770.	ఉప్పరంపల్లి	
22.	కిష్టనేనాయక్ 9963227719.	మేకనాకండ్ల తండా	
23	J. మహేందర్ (ఫోటో) 9666698126	అభంగపట్నం	
24	A. Mohan Naik - 9866121040	ఈశ్వరి తండా	
25.	N. Govindu - 7702660419	11 11	
26	P. Sathaiyamma - 7702660419	11 11	
27.	B. Praveen Kumar (serivenkatapur) 7670863084	serivenkatapur	
28.	K. Raghavulu (upa sarpanch) 9110791574	serivenkatapur	
29	S. Mohan Reddy (Sarpanch) 9959862691	" "	
30	M. Shiva Ramulu Gaud 9440408440	" "	
31	Y. venkat Ram Reddy 8309874023 PACS Cherman Dharwada.	Appampally	

Sl NO	Name	Village	Signature
32	G Ashok Kumar 9502528600.	Teedla	
33	T. Muralidhar Reddy (9440625899	Dharmasagar (M), Padaka President	
34	T. Hanmikreddy 9849553059	Mankal	
35	K. Ravi Kumar 9885588121 (Vice	Mankal	
36	P. Narasimulu 9492128230	Mankal	
37	Thiruga Thirupathi 9502440825	Tirupathi	
38	Shashikumar 9000861733	Shankipeta	
39	D. Harinath 7799483570	Nallakunta Mankal	
40	G. Bimmappa 8187039249	Vinjamoor	
41	N. Laxma Reddy. 9010349146	Vinjamoor	
42	Mohan 8309942337	Vinjamoor	
43	B Venkat Reddy 9110537742	Bhairavkonda	
44	Swathi mallappa 9866855472	Sigavam	
45	Beem Rao 9440333020 P	Sigavam	
46	K. Prakash 9160684177		
47	A [illegible] 9975412811	Mankal	
48	M. Rajender 9000931093	pallegadda	
49	B [illegible] 9703554242	kondapoor	
50	S Mahesh Kumar 9000625516	Kalpur	
51	A. Sudhakar Reddy 9346881332	Appakally	
52	R. Romulu 8186867605	Chinnajedipalli	
53	K. Paramesh 9660854706	Utkoor	
54	Y. Rama Krishna - 7702245289.	Narayanpet	
55	D. Raju 9491488211	N.R.P.T	
56	KADEOPALLY. RAGHU. 9985646717	Narayanpet	
57	Gotla Anjaneyulu 9985320448	Mankal	
58	K. Lakshmaiah Ex Sarpanch 9063685666	Mankal	
59	S. Mohan Reddy Director 9985658605	Mankal	
60	K [illegible] 9948540271	[illegible]	
61	G. Kamal 9948704593	Mankal	
62	Kaspe Goverdhan Mankal. 9460196727	Mankal	
63	[illegible] Ex. MPTC 9966126695	[illegible]	

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Sl.no	Name		village	Signature
64	వెంకట్రావు శాస్త్రి Ex సర్పంచు	9966749616	నువ్వుల్లి	
65	Venkatesh	6300081288	Ramakrishnapally	
66	నీరుచ నామ నాగేశ్వరరావు	9701750743		
77	అప్పల్ల	9912783760	పోతరపల్లి	
88				
	Kathalappa APPAKPally		6300218190	
89.	maimoddin APPAKPally		9966929181	
90.	Venkatreddy - APPAKPally		9985790323	
91.	Abdul APPAKPally		9885024420	
92	లక్ష్మీనరసింహ	కొత్తకండ్లపల్లి	9441301383	
93	" "	మంగ నర్సిములు	9703212893	
94	" "	బసవాకర్ కొత్తపల్లి	9160103735	
95	" "	కొత్తకండ్లపల్లి	9959074937	
96	" "	ఇక్క నర్సింహ		
97	పిళ్ళై నాయక్	పెద్దకొ..	మెహబూబ్‌నగర్	
98	ఆయిగిరి నీలమ్మ	9010768393	"	
100	రామదాసు	6304447204	"	
101	రాములు	9441186443	కనమిళ్ళపల్లి	
102	శివారెడ్డి	9959844917	పెద్దపల్లి	
103	కొత్తకండ్లలు పెద్ది	9542211264	పెద్దపల్లి	
104	కొత్తకండ్లలు	7702062906	పెద్దపల్లి	
105	అక్కమ్మ		పెద్దపల్లి	
106	రామారి కమ్మ		పెద్దపల్లి	
107	కవిష్ణచారి		పెద్దపల్లి	
108	ఎల్లమ్మ		పెద్దపల్లి	
109	R. మునీంద్రరెడ్డి	6304408341	సంగనగిరిపల్లి	
110	A. సంజీవరెడ్డి	9848334620	సంగనగిరిపల్లి	
111	కృష్ణనాయక్	7981965023	సుందరయ్యనగర్	
112	సోమ్లనాయక్	8374558010	నీళ్ళకొండాపల్లి	
113	E Chinna Venkanna	9441591641	మాల్నాకూర్	
114	A Srinu	8106825075	" "	
115	Hari Reddy	9160121245	పెద్దపల్లి	
116	Bhagavanthu	6281545436	బాలుర్‌కాండ్	
117	సవ్వీద్ అంతమ్మసాబ్	8790869598	ఆటోర్	

Sl no	Name		village	Signature
118	Aerragouni-Venkateswarlu. (వేంకటేశ్వర్లు)	(9705558493)	కొల్లూరు	
119	M. Ramakrishna	9705415149 NRPT	Narayanpur	
120	కృష్ణ	7416995183	పల్లిగడ్డ	
121	G. వర్ధంతయ్య	9666271173	చనిగెర	
122	P. పుండరీకులు	9502184353	కొల్లూరు	
123	వ్యాండారి వెంకటస్వామి	9441145591	ముంతపల్లి	
123	J. కృష్ణమూర్తి	9963655273	గుమ్మడిదల	
124	B. నరసింహ	9618257833	దేవాపల్లి	
125	K. వెంకటనారాయణ	9000084011	దేవాపల్లి	
126	Madhav Reddy	9000183968	R & Pally	
127	పురుషోత్తం	8179777350	బండమాదారం	
128	వెంకట్ రామిరెడ్డి	9642923662	వట్టిమీనపల్లి	
129	M. Raju	9550578623	కుచారంపల్లి	
130	పాండు రంగ్ (ప్రొఫెసర్)	6281643352	దేవులపల్లి	
131	V. వెంకటేశ్వర్లు - JAC Chairman	9515368624	నారాయణపేట	
132	క్రిష్ణుల బాలకృష్ణ Advocate	9440029214	Narayanpet	
133	శ్రీరంగం పాండు రంగప్ప	9701964865	నారాయణపేట	
134	చందర్ నాయక్	9160439835	చురువాలాండ్	
135	లక్ష్మీ రెడ్డి	9705957396	పగిడిగోపుల	
136	రాములు (ప్రొఫెసర్)		రామకృష్ణపల్లి	
137	Md Shakir	8885821375	Gudem	
138	N. Ashwini	6281164812	pallegadda	N. Ashwini
139	T. అంజనేయులు	9703693184	pallegadda	
140	K. శ్రీనివాస్		pallegadda	
141	B. THAYAPPA	9110413518.	నారాయణపేట	
142	G. Raghuveer Advocate	9440835594	Narayanpet	
143	Gopal (CPM)	9666774448	Udimalgadda	
144	Mohammad Ali	9398212417	Padmapad	
145	G. Venkatram Reddy	9912830131	NRPT	
146	D. Balram -	9908848991	నారాయణపేట	
147	T. Hanmanth -	8074600392	Kyathanpally	
148	V. BABU	9959831845	LAXMIPUR	
149	B. Sayulu	8340818601	LAXMIPUR	

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Sl NO	Name		Village	Signature
150	M. Anil kumar -	8555818198	NRPT	
151	Angiloviy Gyaud	7981800204	Mursp	
152	B. Kasaikar Rao	9440237426	Sirsaram	
153	P. Narayan Reddy	9441841953	Vinjamoor	
159	J. Papi Reddy	9010900569	Jawahirnagar	
160	N. BHEEM REDDY	9441367106	Amanthapur	
160	Gandhe Chakrapani			
161	K. VIJAY SAGAR		KANAKA P.	
162	A.B. Chenna Reddy			
163	K. Sripada Rao	8186867676	KSPT	NRPT
164	K. Sudarshan Reddy	9440181275	Narayanpet	
165	K. Naresh	9676115636	Shasanpally	
167	[illegible]	9133415454	Mekhanamanthapur	
168	[illegible]	9440867680	[illegible]	
169	D. Karthik	9963214000	N.R.P.T.	
170	E. Venkat Ramulu	- 9440473544	Singaram	
171	M. Ramulu	- 9642080287	Kotakonda	
172	K.B. [illegible]	8978274960	Parapalla	
173	S. Rajasekhar	9959777733	Kothakota	
174	B. Krishnaiah	9398938273	Parpally	
175	G. Srinivas Reddy	9912733033	Veeram pally	
176	AMMA Kalla Srinivas Reddy	9866756520	Gadwaddi Thanda	
177	[illegible]	9177934246	[illegible]	
178	P. [illegible]	9949246907	[illegible]	
179	[illegible]	8309778686	[illegible]	
180	P. Venkatesh Ex (Sarpanch)	9391116868	Anthwar	
181	D. Kattalappa	9177137945	APS: Reddy Reddy	
182	B. Venkat Ramulu	8919313311	Narayanpet	
183	G. Vinod Kumar	9676976775	Narayanpet	
184	P. Rajendra Prasad	9440042621	Kothakota	
185	B. Madhavulu	9490127563	Kothakota	
186	G. Rajender Goud	9440444410	Markal	

Sl. No	Name	Village	Signature
188	S. Ravinder Reddy 9849333699.	Srivinda Hyd.	
189	K. [illegible]	Siddipet	
190	P. [illegible] 9440385526	Sirnapally	P. Ray
191	K. Nagaraju Gowd 9440860538	IDA	
192	Jonnal Subbaiah 9885790780	NRPT	
193	A. Vinod Kumar 9440929550	NRPT.	
194	G. Surender Reddy 7207410411.	Narayan Pet	G. Reddy
195	V. RAMULU 9052932747	Kotakonda	
196	S. Raja vardhan Reddy 9704972229	Jinnaram	
197	[illegible] 9704386969	[illegible]	
198	M. [illegible] 9492766993	[illegible]	M.
199	P. Chakravarthi 9642570066	Ramanapally thanda	P.
200	D. Ramulu 9490910384	Porpally	
201	Sanjeevaiah 9182453823	Porpally	
202	M. Gopal Reddy 9701548548	Kammaypally	
203	Prasad Baby 9493111818	Somlavar	
203	Durgaprasad 8142999394	Kotakondur	
204	V. SRINIVAS Reddy 9492765160	Pedda Reddy	
205	A. [illegible] 9652160827		
206	[illegible] 8106886900	meeditthanda	
207	[illegible] 9553917120	peresapalli.	
208	Bullet Suri 7666774429	Narayanpet	
	L. THIRUPATHAIAH. 9959707448	[illegible]	L. Thirupathaiah
209	Md Osman MC. 9908754855	D. Gudda	
210	K. ASHOK Goud 9491484841	D. Gudda	
211	[illegible] 9908628830	[illegible]	

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Sl no.	Name		Village	Signature
212	Hanmanthu Sarpanch		Dimmapally	
213	B. Mogulaiah Sarpanch		Kesthapur	
214	N. Raghavender Reddy Sarpanch		Penchikalpadu	
215	Siddhartha Kishore MPTC		Penchikalpadu	
216	G. Narsimha Reddy	9948182999	Veerareddy	
217	K. Krishna Reddy	9398791274	Mallareddy	
218	K Chandrashekar	9491491814	Dhanwada	
219	Y. Krishna Reddy	9441167078	Appireddy	
220	J. Satya Narayana	9849067268	Dharavath	
221	D. Sudheer Kumar Rao	8501872915	Gummadi	
222	M. A. Waheed.	9440981178	Gandhari	
223	V. Nagaraju	9160464343	Jinka	
224	Ramesh.	9160771152	Mallikpur	
225	V. Gemya Naik	9948949681	Kalyanabandatanda, Ankilla	
226	D. Priyanka	9963383209 MPTC	Ibrahimnagar	
227	Anjappa Woodmanch	9959677154	Boinpally	
228	[illegible]	9908069531	[illegible]	

Sl.No	Name	Village	Signature
229	G. Anuradha 9440271944	Narayanpet	
230	Bandi. Rajeshwari 9550052688 (15 ward councilor)	Narayanpet	B. Rajeshwari
231	J. Anitha. 9885790788. (2nd ward councilor)	Narayanpet	J. Anitha
232	G. Anasuya. 9440366616 (Municipal Chairman)	Narayanpet	
233	B Jammabay. 9908114474.	Narayanpet	
234	T. Anjalli 9903885536 (Z.P.T.C)	Cherapalli	
235	Manemma. (M.PTC).	Suraam.	
236	Yasodha. (Vad no 3.)	Surram.	
237	Nilleday. Sarpanchu	Thirllapuram	
238	Jalli Thamma. Vadno 949.3113512	Narayanpet (Irrand)	
239	P. Narsimhulu Sarpanch 9908745801	Malkapur	
240	Anjayllu. Koil చెరువు కింద	Kallkonda	
241	Mo Siddiq 8790235183	Koilkonda	
242	వెంకటేష్ 9550998511	చిన్నచింతకుంట	
243	ఇంది శివమ్మ 9440981646	నారాయణపేట	
244	Kotla Rajavardhan Reddy 9440898637	Narayanpet	
245	G. Mallaiah yadav 9948646019	Koilkonda	
246	A. [illegible] 9490678731	Koilkonda	
247	B. [illegible] 7893367299	[illegible]	
248	[illegible] 9032221117	[illegible]	
249	B. [illegible] 7093674921	[illegible] NRPT	
250	B. [illegible] 9959812755	[illegible]	
251	P. Nagaiah 7702760659	[illegible]	
252	P. Vasu Rathod, 9010988471	Ramampally Thanda	
253	[illegible] 8985000839	[illegible]	
254	[illegible] 9989511250	[illegible]	
255	A [illegible] 9440148906	[illegible]	
256	[illegible] 9704306371	Koilkonda	
257	K Shyam. 9701732238	Koilkonda	
258	K. Mohan 7095337850	Malkapur	
259	K. Prathap Reddy 9440626022	Malkapur	
260	Thammappa 8008026378	Singaram	
261	[illegible] 9391688288		

Minutes of Meeting-Public Hearing

Narayanpet

Proceedings of the Environmental Public Hearing for the proposed Palamaru Rangareddy Lift Irrigation Scheme (Irrigation Project) in the state of Telangana which includes canal network to irrigate an ayacut of 1,60,955 acres of upland areas in 155 villages of 9 Mandals in Narayanpet District held at Anjana Garden Function Hall, Narayanpet, Narayanpet District on 10.08.2021 at 11.00 AM.

The following Public Hearing panel members were present:

S. No.	Name of the Panel Member	Name of the Department
1.	Smt. Hari Chandana Dasari, IAS, District Collector & Magistrate, Narayanpet District	The Collector & District Magistrate, Narayanpet District
2.	Sri Kumar Pathak, Environmental Engineer, Telangana State Pollution Control Board, Head Office, Hyderabad	Representative of the Telangana State Pollution Control Board.

The following officials were present:

S. No.	Name & Designation
1.	Sri K. Chandra Reddy, Additional Collector (LB), Narayanpet District
2.	Sri K. Siddiramappa, CEO, Zilla Parishad, Narayanpet District
3.	Sri N. Shivadharmateja, SE, Irrigation & CAD Department, IC3, Makthal
4	Sri R. Dayanand, Executive Engineer, Irrigation & CAD Department, Division-I, Mahabubnagar
5	Dr. Arvind Dubey, Environmental Consultant, M/s. Voyants Solutions Private Limited

At the outset, the District Collector, Narayanpet District, welcomed all the public, officials and media for the public hearing and informed the following:

- The Narayanpet is a drought affected area and the proposed project will help in increasing groundwater level and irrigation potential.
- About 5 lakh Ha of ayacut will be covered in the state by the proposed project by lifting Srisailam backwater.
- Canal network is proposed in 155 villages in 9 mandals of Narayanpet district to provide irrigation in 1.6 lakh acres of land.
- The project details were explained by the Irrigation department and environmental issues will be explained by Environmental Engineer, PCB.
- It was stated that the public hearing is a mandatory process for obtaining environmental clearance.

- The public was invited to offer their views, suggestions advices on the proposed project. The written representations were also sought.
- All the representations, views, opinions will be taken. Only environmental issues related to the proposed project may be informed.
- The public were invited to share their opinion duly maintaining discipline and following COVID safety precautions.

The Environmental Engineer, TSPCB explained about the details of provision of public hearing, the EE, Irrigation & CAD Department explained about project details and the environmental consultant explained about the Environment Impact Assessment studies carried out for this project.

Kumar Pathak, Environmental Engineer, TSPCB, Head Office, Hyderabad informed the following:

- The Ministry of Environment & Forests, Government of India earlier issued Notification in 1994 under Environment (Protection) Act, 1986, wherein environmental clearance was mandated for certain projects and was issued by Central Govt.
- Subsequently, the Ministry of Environment, Forests and Climate Change, Government of India notified Environment Impact Assessment Notification (EIA), 2006, in supersession of the 1994 Notification.
- As per the above Notification, Prior Environmental Clearance is required for certain projects / activities (as listed in the Schedule) based on their potential environmental impacts.
- The projects requiring environmental clearance were classified under Category-A and Category-B. The clearances for Category-A are issued by Central Govt. and that for Category-B are issued by State level Environment Impact Assessment Authority.
- In accordance with the procedure laid down in the above Notification, the Environmental Public Hearing is a mandatory process for the Projects covered under the Notification.
- The proposed Palamaru Rangareddy Lift Irrigation Scheme is an Irrigation Project which is covered under the above Notification under Category A (1(c)(ii) – Irrigation Projects with ≥ 50,000 ha of culturable command area.
- The project has obtained Terms of Reference from MoEF, GOI and accordingly carried out EIA study.
- This Environmental Public Hearing is being held to elicit the views, opinion, suggestions of the public on the proposed project.
- As per the provisions, Press Notification about the public hearing was published in Telugu and English daily news papers on 10.07.2021 i.e. Namaste Telangana news paper and The Hans India English daily news paper.

- The entire proceeding of the Environmental Public Hearing will be video graphed and the Video CD will be sent to the Ministry of Environment & Forests and Climate Change (MoEF& CC), Government of India along with the views and comments expressed by the public on the project.

He then requested the Executive Engineer, Irrigation & CAD Department, Division-I, Mahabubnagar to explain the details of the Palamaru Rangareddy Lift Irrigation Scheme to the public.

Sri R. Dayanand, Executive Engineer, Irrigation & CAD Department, Division-I, Mahabubnagar welcomed all for the public hearing and explained the following:

- People of Narayanpet district traditionally migrate to various places of the country in search of jobs as it is a drought prone area and lack of irrigation and drinking water.
- The PRLIS project is being taken up to provide proper irrigation facilities and to bring drought prone area into cultivation and this will facilitate to exterminate the migration.
- On completion of Palamuru-Rangareddy Lift Irrigation Scheme, 6 districts, 70 mandals and 1220 villages are going to be benefitted.
- This project is taken up in two phases, 1st phase is for drinking water and industrial use by building reservoirs at six places by lifting 90 TMC water in 60 flood days from foreshore of the Srisailam reservoir, 2nd phase is for providing irrigation facilities for drought prone areas of Mahabubnagar, Nagarkurnool, Narayanpet, Vikarabad, Rangareddy and Nalgonda districts.
- He explained overall project details starting from Srisailam Reservoir intake to K.P Laxmidevipally reservoir duly explaining in detail regarding all lifts and reservoirs such as Narlapur, Yedula, Vattem, Karvena, Uddandapurand K.P Laxmidevipally.
- 9 mandals of Narayanpet district namely, Kosgi, Maddur, Narayanpet, Dhanwada, Damargidda, Marikal, Makthal, Narva and Utkoor mandals will get irrigation water from the canals of Karvena Reservoir and Uddandapur Reservoir.
- Karvena reservoir is in progress and got filled with its own catchment area during monsoon of the year 2020 upto 1 TMC against the full capacity of 17.34 TMC.
- Narayanpet district is situated at various altitudes around +435.00 M.S.L and these areas will get water from Karvena and Uddandapur reservoirs. Approximately 1,60,995 acres in 9 Mandals, 155 Villages will be irrigated in Narayanpet district by this project.
- An open canal from Karvena reservoir runs 54 Km out of 108 Km and similarly Maddur canal from Uddandapur reservoir runs 37Km out of 113 Km in Narayanpet district.
- Drinking water is also going to be provided to enroute villages.
- Land acquisition for canal network will be there so that the command area will be developed. He has mentioned that 2,516 acres will be acquired in Narayanpet district for the purpose of canals.

- The immigrants will return to their homes once this project is successfully completed. Local people will get various indirect employment benefits during construction and after completion of this project. Economy and commerce of the district will be improved and associated sectors like fisheries, animal husbandry will get benefitted by this project. Tourism will also be developed. He requested everyone to co operate for this project for its successful completion.

Dr. Arvind Dubey, Environmental Consultant, M/s. Voyants Solutions Private Limited has given presentation before the public and informed the following:

- M/s. Voyants Solutions Pvt. Ltd, Gurugram, Haryana, has conducted the Environment Impact Assessment Study as per approved ToR issued by the MoEF&CC, New Delhi, vide letter dated 11.10.2017.
- Existing status of Air Quality was evaluated by setting up six locations to conduct air quality monitoring in respect of PM2.5, PM10, SO2 and NOx.
- The sound level was measured at six locations by sound level meter.
- Physical and chemical characteristics of the soil were studied in respect of six samples taken from the study area.
- Samples were taken from six locations for evaluating physical, chemical and biological characteristics of surface and ground water.
- Phytosociology of plants and diversity of the forest vegetation was determined based on field survey of the area. Various transects were identified along the villages to carry out faunal studies.
- The data on socio economic was collected to gather information on public perception of the proposed project. Data was also collected from secondary sources to validate the information and to supplement the data on demographic aspects.

  Analysis results:

- The results of the soil analysis show that the soil is neutral to slightly basic at all the locations having pH varying from 7.20 to 7.65. The texture of the soil varies from sandy clay loam to clay. Available nitrogen content in the surface soils ranges between 133.5 to 185.2 kg/ha thereby is indicating that soils are low in available nitrogen content. Available phosphorus content ranges between 12.1 to 15.9 kg/ha, thereby indicating that soils are medium in available phosphorus. Available potassium content in these soils ranges between 167.3 to 204 kg/ha, thereby indicating medium to high in potassium content. The organic carbon varies from 0.49 % to 0.73% thereby implying that soils have low to medium organic carbon.
- The pollutants concentration in the air is well below the permissible limit (PM10: 18.3–49.3 µg/m3; PM2.5: 9.9 – 26.9 µg/m3; NOx: 7.5-18.3 µg/m3) and SO2: 5-7.4 µg/m3 as there are no industries in the area and the density of vehicular traffic is not alarming.

- The noise monitoring shows that day and night time noise levels are within the prescribed limits.
- The analysis results have been compared with the Tolerance limits for inland surface waters, Class – C. The pH values ranged between 7.60-8.16 and was within the permissible limit (6.5-8.5). The TDS levels ranged from 151 to 248 mg/l and were well below the desirable limit of 500 mg/l. The chlorides level in surface water samples ranged from 24.6 to 50 mg/l and were below the desirable limit of 250 mg/l. The sulphates level ranged from 18.5 to 37.2 mg/l and were below the desirable limit of 200 mg/l. The nitrate level ranged between 2.6 to 4.1 mg/l and was lower than the desirable limit of 45 mg/l. The ground water had all parameters within the desirable limits.

Evaluation of impacts:

- Due to construction activities, there shall be temporary and nominal effect on the ambient temperature and humidity. The operation stage project may not create any impact on the meteorology and climatology of the area.
- During the operation phase no change in land use is expected. Many of the redundant areas having no further usage will be brought under plantation.
- Soil erosion due to project activities will not exist in the operation phase as the construction would be completed and landscape restoration work would also be implemented
- The intensity of anticipated environmental impact on geology of the area will be weak and extent of anticipated impact will be local. No impact is anticipated on the geology of the area during the operation phase.
- Ground water recharge from implementation and operation of PRLIS system shall be due to seepage from reservoir, losses from canal system and field application.
- Temporary changes in air quality during construction phase are expected due to emission from vehicles and blasting operations. The resultant impact on the Ambient air quality are within the NAAQS.
- Temporary increase in noise levels are expected during construction phase only.
- The impact on water bodies during construction with the slight increase in turbidity in the river/ water bodies but the transparency of the water shall not be impaired. Apart from ground water recharge, quality of ground water will also improve in the entire area.
- The vegetation composition of the project zone is widely distributed and there will be no significant loss to the habitat. However, any loss of vegetation during the project activity period will be restored in due course of time. The floral abundance of the project area in post construction phase will increase by many folds as the plantation under green belt, restoration and landscaping will be completed.

- There will be no alteration to the existing habitat of endangered and threatened species. There is also no wildlife sanctuary, national park and biosphere reserve near the project area.
- There is no any displacement and R&R due to the Project. The Compensation for the land acquisition shall be given as per Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation & Resettlement (RFCTLARR) Act 2013 and Telangana State Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2014.

Air pollution during construction phase:

The sources of air pollution during construction phase are from fuel combustion, emissions from crushers and vehicular movement.

Mitigation measures:

- Stockpiling of excavated material will be covered or staged offsite location.
- Maintenance and proper functioning construction equipment.
- Proper repair and maintenance of roads and effective traffic management.
- Covering trucks transporting soil, sand, and other loose materials.
- Regular sweeping of construction area and vicinity and water sprinkling on kutcha surface / earthen roads.
- G.I. Sheets cover, Wind breakers and sprinklers to control emissions from Stone crushers.
- All conveyor belts to be hooded or covered by G.C. Sheets. Screen classifiers to be covered by G.C. Sheets.
- Acoustic enclosures and stacks as per CPCB norms for DG sets.

Water pollution during construction phase:

The sewage generated from project colony and various labour camps is the source of water pollution during construction phase. It is proposed to provide STP for treatment of sewage.

Municipal Solid waste

The biodegradable wastes are proposed to be processed by composting, vermin-composting. Recoverable waste for recycling.

Development of Greenbelt

The green belt is proposed to be developed within the project area along both banks of main canal, service roads of distribution network and project colonies.

Project Benefits:

- Project will irrigate 4,97,976 Ha. of lands at 1226 villages, 70 mandals in 6 districts of Telangana state.
- The project will also provide safe drinking water to 6 districts and also in Hyderabad city.
- Atleast 50 lakhs people will be benefitted with safe drinking water and uninterrupted irrigation water for their cultivation process.

- Rabi and Kharif cultivation process will be improved and productivity will be improved, as the project impacted area will not be affected due to drought.
- Groundwater recharge in command area will be improved
- Agro based products and industries will get boosted.
- Atleast 7000 job generation will be made during construction process of PRLIS Project. Indirect job generation also will be witnessed during the project construction and operation.

The District Collector requested the public gathered to offer their views, opinion, suggestions on the proposed Irrigation project.

1. Sri K. Ramakrishna, Koilkonda stated that there is no pollution as there are no factories in the area and welcomed the proposed irrigation project.
2. Sri Srinivas Reddy, Narayanpet stated that the Narayanpet is situated at high level and is backward area due lack of water. The area is dependent on farmers and weavers. We will cooperate in implementing the project and become stakeholders.
3. Sri Vittal Rao, Retd. Engineerof Irrigation Department explained the importance of the proposed project. He stated that about 68% of Krishna river catchment falls in Mahabubnagar, Rangareddy and Nalgonda districts. This area is backward since 50 years. All shall support the project as the project will bring development in the area.
4. Sri K. Bheem Reddy, Dhamargiddha (V&M) stated that the Narayanpet is one of the draught affected area and many people from the district migrated to other areas. He requested to complete the project urgently so as to stop migration of people from the district.
5. Sri Rajender Goud, Marikal (M) stated that the proposed project is a long time dream of the people and there are no environmental impact of the project. He requested for early completion of the project.
6. Sri S.P. Reddy, General Secretary, Retd. Engineers Association informed that the project was earlier proposed in 2010 but could not be materialised. The Phase-I of the project for drinking water is already started. The proposed project will irrigate 1.6 lakhs acres of land in Narayanpet district. He suggested the Irrigation department to explore water distribution through pipeline network instead of canals.
7. Sri Damodar Reddy, Vithalapur stated that the Narayanpet area is high altitude and rainfed area. He requested for early completion of the project and they will support in land acquisition.
8. Sri Venkataiah, Maddhur welcomed the project and requested to provide additional reservoir at Kanukurthi.
9. Sri Venkat Reddy, Kanukurthi invited the project and stated that they will cooperate fully to develop the area. The water distribution should be efficient. There are no environmental objections from them for the proposed project.

10. Sri Bandi Shivarami Reddy, Narayanpet stated that there are no environmental issues due to the proposed project. There is considerable fishermen community in the area and hence facility should be provided for fisheries development in the area. The cattle may be provided for development of Women Associations.
11. Sri Athma Ram, Retd. Engineer stated that we all know about the importance of the proposed project and hence all of them are extending full support for the project.
12. Sri Sai Reddy, Kollampally stated that their village is a backward area and there is migration of people to outside. He requested to complete the project as early as possible and provide irrigation water so that migration of people can be stopped.
13. Sri Madhavulu, Koyakonda stated that their community will fully support the proposed project as it benefits the area.
14. Sri Pada Kulkarni, Narayanpet stated that this is backward and draught prone area. He requested that the PRILS project may be completed in time so that surface water and groundwater will be increased. This will help to increase cattle grazing area and will stop migration of cattle to other districts.
15. Sri Sathya Reddy, Gharlapadu (V) stated that they will fully support the project.
16. Sri Bhurlapadu Ravi Kumar, Abhangapur stated that there are no environmental impact of the project and requested for early completion of the project.
17. Sri Sambaiah, Retd. Chief Engineer, Irrigation dept, informed that he earlier worked in Godavari and Krishna delta area and the proposed project will result in development of the area and there will not be any negative environmental impact of the project.
18. Sri Sanjeevaiah, Parpally stated that they do not have any objection and do not envisage negative environmental impact of the project. As their village is agriculture-based, the project may be completed early. It will be useful for their development.
19. Sri Gouri Satish Kumar, Manikonda stated that they offer total support for the proposed project.
20. Sri G. Shiva Kumar, Dhanwada stated that they offer total support for the proposed project. The project will be very useful if completed in time-bound manner.
21. Sri Sai Kumar, Narayanpet informed that the proposed project envisages to lift water from longer distance. The same may be done from Krishna river which is at 40 km from Narayanpet, as per GO Ms. No. 69.
22. Sri Venkataiah, Thirumalapur stated that all the 31 communities from their area fully support the proposed project. He requested to provide reservoir for their village.
23. Sri Eatappa, Dhamargiddha stated that they will give full support to the project as the project will help in development of fisheries, agriculture and traditional local occupations.
24. Sri B Ramulu Shernapally stated that 21 villages of their mandal are covered under the project. They offer total support for the proposed project and requested for early completion of the project.

25. M Ramulu Kotakonda stated that water is lifted from longer distance in the proposed project. The same may be done from Krishna River which is at 40 km from Narayanpet. He requested to provide lift irrigation facility for Pedda Cheruvu located in their village. There are no objection from environmental angle of the project.
26. Sri V. Chakravarthy, Ramanapally Thanda stated that they fully support the proposed project.
27. Sri Kishan Rao, Dhamargiddha stated that they fully support the proposed project.
28. Smt. Bandi Rajeshwari, Narayanpet stated that there is no objection to any environmental impact of the project and that they fully support the proposed project.
29. Sri Thirupathaiah, Marikal stated that greenery will be increased due to proposed project. It will help shepherd community for grazing their sheep & goats and will result in their development.
30. Sri G. Ashanna, Dhamargiddha stated that 16 villages of their mandal are covered under the project. He requested to provide water to other villages also of their mandal. The project must come to stop migration of people from their area.
31. Sri K. Hanumanth, Ealigandla requested to avoid land acquisition from small and marginal farmers. He stated that the land acquisition should be done in transparent manner from large farmers. They will fully support the project.
32. Sri Rajyavardhan Reddy, Zinnaram stated that their area is dry with very low rainfall and there is migration of people. He requested that the project may be discussed with the MLAs and try to complete the project as soon as possible. They will fully support the project.
33. Sri Nagaraju, Narayanpet stated that the Telangana State is achieved by lot of struggle and efforts of the people. Hence, we should fully support the project so that there will development in the area. They do not see any negative environmental impact of the project.
34. Sri Rajesh, Narayanpet stated that the proposed project is the result of Telangana agitation. They will fully support the project. They do not expect negative environmental impact of the project.
35. K. Chandrasekhar, Dhanwada stated that only 9 villages of their mandal are covered by the project. He requested that the remaining villages may also be covered in the project. He requested to provide lift irrigation for Gandi Cheruvu, as it will provide more water for agriculture in their area.
36. Sri Hanmi Reddy, Marikal stated that they will offer total support for the project.

The Collector & District Magistrate, Narayanpet District informed that the views, opinions and suggestions of the public and the representations submitted by the people are recorded and the same will be forwarded to the central government.

The Collector & District Magistrate thanked all the public, public representatives, experts, MPTCs, ZPTCs, Sarpanch, Farmer Cooperative Societies, fishermen societies for participation and sharing their views, suggestions & opinions on the Project.

The Collector & District Magistrate, Narayanpet District concluded the public hearing with positive note.

There is an overwhelming majority support to the project implementation in Narayanpet District. Only 2-3 opinions and written requests pertain to another project of the state government and for land acquisition issues, which are not concerned with the current subject matter.

Further written representations received during the public hearing are enclosed herewith.

List of the public participated in the public hearing and video graphy of the entire proceedings is also appended.

12.08.2021

Kumar Pathak
Environmental Engineer
T.S. Pollution Control Board
Head Office, Hyderabad

Smt. Hari Chandana Dasari, IAS,
District Collector & Magistrate,
Narayanpet District

తెలంగాణ ప్రభుత్వం నీటిపారుదల శాఖ ప్రతిపాదించిన పాలమూరురంగారెడ్డి ఎత్తిపోతలపథకం (PRLIS) - కెనాల్నెట్వర్క్ - ప్యా - 2 (నీటిపారుదల) నీటిపారుదల ప్రాజెక్టు ప్రధాన కాలువల ద్వారా నారాయణపేట జిల్లాలో 9మండలాలు, 155 గ్రామపంచాయతీలలో 1,60,955 ఎకరాలమెట్ట ప్రాంతాల ఆయకట్టుకు సాగు నీటి వసరులు కల్పించడం కోసం తేదీ 10.08.2021 ఉదయము 11:00 గంటలకు అంజన గార్డెన్ ఫంక్షన్ హాల్, నారాయణపేట, నారాయణపేట జిల్లా, తెలంగాణ ప్రాంగణములో జరిగిన పర్యావరణ ప్రజాభిప్రాయ సేకరణ సమావేశము యొక్క నిముషాలు (ప్రొసీడింగ్స్).

కింది పబ్లిక్ హియరింగ్ ప్యానెల్ సభ్యులు హాజరయ్యారు :

వ. సం.	ప్యానెల్ సభ్యుని పేరు	శాఖ పేరు
1	శ్రీమతి. హరి చందన దాసరి, IAS , జిల్లా కలెక్టర్ & మెజిస్ట్రేట్, నారాయణపేట జిల్లా	కలెక్టర్ & జిల్లా మెజిస్ట్రేట్, నారాయణపేట జిల్లా
2	శ్రీ కుమార్ పొరక్ , పర్యావరణ ఇంజనీర్, తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి, ప్రధాన కార్యాలయం , హైదరాబాద్	తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి ప్రతినిధి .

కింది అధికారులు హాజరయ్యారు:

వ. సం.	పేరు & హోదా
1	శ్రీ కె. చంద్ర రెడ్డి, అదనపు కలెక్టర్ (LB) , నారాయణపేట జిల్లా
2	శ్రీ క. సిద్దరామప్ప , CEO , జిల్లా పరిషత్, నారాయణపేట జిల్లా
3.	శ్రీ ఎన్. శివధర్మతేజ, SE, నీటిపారుదల & CAD విభాగం , IC3, మక్తల్
4	శ్రీ ఆర్. దయానంద్, ఎగ్జిక్యూటివ్ ఇంజనీర్, నీటిపారుదల & CAD విభాగం, డివిజన్ -1, మహబూబ్ నగర్
5	డాక్టర్ అరవింద్ దూటి, పర్యావరణ సలహాదారు, M/s. వేయంట్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్

ప్రారంభంలో, జిల్లా కలెక్టర్, నారాయణపేట జిల్లా, పబ్లిక్ హియరింగ్ కోసం ప్రజలందరినీ, అధికారులను మరియు మీడియాను స్వాగతించారు మరియు కింది విషయాలు తెలియజేసారు :

- నారాయణపేట కరువు ప్రభావిత ప్రాంతం మరియు ప్రతిపాదిత ప్రాజెక్ట్ భూగర్భ జలమట్టం మరియు నీటిపారుదల సామర్థ్యాన్ని పెంచడంలో సహాయపడుతుంది.
- శ్రీశైలం బ్యాక్‌వాటర్‌ని ఎత్తిపోయడం ద్వారా ప్రతిపాదిత ప్రాజెక్ట్ ద్వారా రాష్ట్రంలో దాదాపు 5 లక్షల హెక్టార్ల ఆయకట్ సాగులోకి వస్తుంది.
- నారాయణపేట జిల్లాలోని 9 మండలాల్లోని 155 గ్రామాల్లో 1.6 లక్షల ఎకరాల భూమికి సాగునీరు అందించడానికి కెనాల్ నెట్‌వర్క్ ప్రతిపాదించబడింది.
- ప్రాజెక్ట్ వివరాలను నీటిపారుదల శాఖ ఇంజనీర్ మరియు పర్యావరణ సమస్యలను కాలుష్య నియంత్రణ మండలి పర్యావరణ ఇంజనీర్ వివరిస్తారు.

- పర్యావరణ ప్రజాభిప్రాయము అనేది పర్యావరణ అనుమతులు పొందడానికి తప్పనిసరి ప్రక్రియ.
- ప్రతిపాదిత ప్రాజెక్ట్ గురించి ప్రజలు తమ అభిప్రాయాలు, సలహాలను అందించవచ్చు. వ్రాతపూర్వక ప్రాతినిధ్యాలను కూడా సమర్పించవచ్చు.
- అన్ని ప్రాతినిధ్యాలు, వీక్షణలు, అభిప్రాయాలు తీసుకోబడతాయని, ప్రతిపాదిత ప్రాజెక్టుకు సంబంధించిన పర్యావరణ సమస్యలను మాత్రమే తెలియజేయాలని పేర్కొన్నారు.
- క్షమాపణను పాటించి మరియు COVID భద్రతా జాగ్రత్తలను అనుసరించడం ద్వారా ప్రజలు తమ అభిప్రాయాన్ని పంచుకోవాలని తెలియజేసారు.

పర్యావరణ ఇంజనీర్, తెలంగాణ కాలుష్య నియంత్రణ మండలి ప్రజా విచారణ నియమం యొక్క వివరాలను గురించి, EE ఇరిగేషన్ & CAD డిపార్ట్‌మెంట్ ప్రాజెక్ట్ వివరాల గురించి మరియు పర్యావరణ కన్సల్టెంట్ ఈ ప్రాజెక్ట్ కోసం నిర్వహించిన పర్యావరణ ప్రభావ అంచనా అధ్యయనాల గురించి వివరిస్తారని తెలియజేసారు.

కుమార్ పొరక, ఎన్విరాన్‌మెంటల్ ఇంజనీర్, తెలంగాణ కాలుష్య నియంత్రణ మండలి , ప్రధాన కార్యాలయం, హైదరాబాద్ ఈ క్రింది విషయాలను తెలియజేసారు :

- భారత ప్రభుత్వం పర్యావరణం & అటవీ మంత్రిత్వ శాఖ గతంలో 1994 లో పర్యావరణ (రక్షణ) చట్టం, 1986 కింద నోటిఫికేషన్ జారీ చేసిన చట్టం ఆధారంగా,కొన్ని ప్రాజెక్టులకు పర్యావరణ అనుమతి తప్పనిసరి ఉత్తర్వులను కేంద్ర ప్రభుత్వం జారీ చేసింది.
- తదనంతరం, 1994 నాటి నోటిఫికేషన్ పర్యవేక్షణలో భారత ప్రభుత్వం పర్యావరణ, అడవులు మరియు వాతావరణ మార్పు మంత్రిత్వ శాఖ, పర్యావరణ ప్రభావ అంచనా నోటిఫికేషన్ (EIA), 2006 ను జారీచేశారు.
- పైన పేర్కొన్న నోటిఫికేషన్ ప్రకారం, పర్యావరణానికి సంబంధించిన సంభావ్య ప్రభావాల ఆధారంగా కొన్ని ప్రాజెక్టులు / కార్యకలాపాలకు (షెడ్యూల్‌లో జాబితా చేసినట్లుగా) ముందుగా పర్యావరణ క్లియరెన్స్ అవసరం .
- పర్యావరణ అనుమతి అవసరమయ్యే ప్రాజెక్టులు కేటగిరీ-ఎ మరియు కేటగిరీ-బి కింద వర్గీకరించబడ్డాయి. కేటగిరీ-ఎ కొరకు అనుమతులను కేంద్ర ప్రభుత్వం జారీ చేస్తుందని మరియు కేటగిరీ-బి కొరకు రాష్ట్ర స్థాయి పర్యావరణ ప్రభావ అంచనా ప్రాధికార సంస్థ జారీ చేస్తుందని ఆయన పేర్కొన్నారు.
- పై నోటిఫికేషన్‌లో పేర్కొన్న విధానానికి అనుగుణంగా, నోటిఫికేషన్ లో పేర్కొనబడిన ప్రాజెక్టులకు పర్యావరణ పబ్లిక్ హియరింగ్ తప్పనిసరి ప్రక్రియ.
- ప్రతిపాదిత పాలమూరురంగారెడ్డి ఎత్తిపోతల పథకం అనేది ఒకసాగు నీటిప్రాజెక్ట్, ఇదివర్గం A (1 (c) (ii) సాగునీటిప్రాజెక్టులు ≥ 50,000 హెక్టార్ల కల్చరబుల్‌కమాండ్ ఏరియాతో) కింద పేర్కొన్న నోటిఫికేషన్ లో వివరించబడింది.
- EIA చేసిన అధ్యయనం తదనుగుణంగా ఈ ప్రాజెక్ట్ MoEF, GOI నుండి రిఫరెన్స్ నిబంధనలకు అనుగుణంగా రూపొందించబడింది.
- ప్రతిపాదిత ప్రాజెక్టుపై ప్రజల అభిప్రాయాలు, సలహాలను తెలుసుకునేందుకు ఈ పర్యావరణ ప్రజాభిప్రాయ సేకరణ సమావేశం నిర్వహించబడింది.

- నిబంధనల ప్రకారం, పబ్లిక్ హియరింగ్ గురించి ప్రెస్ నోటిఫికేషన్ 10.07.2021 న తెలుగు మరియు ఇంగ్లీష్ రోజువారీ వార్తా పత్రికలలోనమస్తే తెలంగాణ న్యూస్ పేపర్ మరియు ది హన్స్ ఇండియా ఇంగ్లీష్ డైలీ న్యూస్ పేపర్‌లో ప్రచురించబడింది.
- ఎన్విరాన్‌మెంటల్ పబ్లిక్ హియరింగ్ ప్రక్రియ మొత్తం వీడియో గ్రాఫ్ చేయబడుతుంది మరియు వీడియో సీడీ, పర్యావరణం & అడవులు మరియు వాతావరణ మార్పు మంత్రిత్వ శాఖకు (MoEF&CC), ప్రాజెక్ట్ గురించి ప్రజల నుండి వ్యక్తీకరించబడిన అభిప్రాయాలు మరియు వ్యాఖ్యలతో పాటు పంపబడుతుంది.

తదనంతరం పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీమ్ వివరాలను ప్రజలకు వివరించవలసిందిగా ఎగ్జిక్యూటివ్ ఇంజనీర్, ఇరిగేషన్ & CAD విభాగం, డివిజన్ -1, మహబూబ్‌నగర్ గారిని సాదరంగా ఆహ్వానించారు.

శ్రీ ఆర్ దయానంద్, ఎగ్జిక్యూటివ్ ఇంజనీర్, ఇరిగేషన్ & CAD శాఖ, డివిజన్-1, మహబూబ్నగర్ పర్యావరణ ప్రజాభిప్రాయ సేకరణ కార్యక్రమానికి అందరిని స్వాగతించారు మరియు ఈక్రింది విషయాలను వివరించారు:

- నారాయణపేట కరువు పీడిత ప్రాంతం మరియు సాగునీరు,తాగునీరు లేకపోవడంతో నారాయణపేటజిల్లా ప్రజలు ఉద్యోగాలకోసం దేశంలోని వివిధ ప్రాంతాలకు వలస వెళ్లారు.
- సరైన నీటిపారుదల సౌకర్యాలను అందించడానికి మరియు కరువు పీడిత ప్రాంతాన్ని సాగులోకి తీసుకురావడానికి PRLIS ప్రాజెక్ట్ ప్రతిపాదించబడింది మరియు ఇది వలసలను నిర్మూలించడానికి దోహదపడుతుంది .
- పాలమూరు-రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీమ్ పూర్తయిన తర్వాత, 6 జిల్లాలోని, 70 మండలాలో 1220 గ్రామాలు ప్రయోజనం పొందబోతున్నాయి.
- ఈ ప్రాజెక్ట్ రెండు దశల్లో చేపట్టబడింది, మొదటిదశలో తాగునీరు మరియు పారిశ్రామిక వినియోగంకోసం, 2 వదశలోమహబూబ్నగర్, నాగర్కర్నూల్, నారాయణపేట, వికారాబాద్, రంగారెడ్డి మరియు నల్గొండ జిల్లాల కరువుపీడిత ప్రాంతాలకు నీటిపారుదల సౌకర్యాలను కల్పించడం కోసం శ్రీశైలంజలాశయం ముందుభాగంనుండి 60 వరదరోజులలో 90 TMC నీటిని ఎత్తి ఆరుప్రదేశాలలో రిజర్వాయర్లు నిర్మించి అక్కడినుండి సాగునీటిని అందిచడం.
- శ్రీశైలంరిజర్వాయర్ నుంచి తీసుకోవడం మొదలుకొని కె.పి లక్ష్మీదేవిపల్లిరిజర్వాయర్వరకు మొత్తం ప్రాజెక్టు వివరాలను ఆయన వివరించారు. నార్లాపూర్, ఏదుల, వట్టెం, కర్వెన, ఉద్దండపురం, కె.పి లక్ష్మీదేవిపల్లి వంటి అన్ని లిఫ్టులు మరియు రిజర్వాయర్ల గురించి వివరంగా వివరించారు.
- నారాయణపేట జిల్లాలోని 9 మండలాలు, కోస్గి, మద్దూర్, నారాయణపేట, ధన్వాడ, దామరగిద్ద, మరికల్, మక్తల్, నర్వ మరియు ఉత్కూరు మండలాలకు కర్వెన రిజర్వాయర్ మరియు ఉద్దండాపూర్ రిజర్వాయర్ కాలువల నుండి సాగునీరు అందుతుంది.
- కర్వెన జలాశయం పురోగతిలో ఉంది మరియు 17.34 టిఎంసిల పూర్తి సామర్థ్యానికి వ్యతిరేకంగా 1 టిఎంసి వరకు 2020 సంవత్సరం వర్షాకాలంలో దాని స్వంత పరీవాహక ప్రాంతంతో నిండిపోయింది .
- నారాయణపేటజిల్లా సుమారు +435.00 M.S.L ఎత్తులో వుంది మరియు ఈ ప్రాంతాలకు కర్వెన మరియు ఉద్దండాపూర్ రిజర్వాయర్ల నుండి నీరు అందుతుంది. ఈ ప్రాజెక్ట్ ద్వారా నారాయణపేటజిల్లాలో 9 మండలాలు, 155 గ్రామాలకు సుమారు 1,60,995 ఎకరాలకు సాగునీరు అందించబడుతుందని ఆయన తెలియజేసారు.

- కర్వెన జలాశయం నుండి ఒక ఓపెన్కెనాల్ 108 Km కి గాను 54 Km మరియు అదేవిధంగా ఉద్దండాపూర్ రిజర్వాయర్ల నుండి మద్దూర్ కెనాల్ నారాయణపేటజిల్లాలో 113 Km కి గాను 37 కి.మీ. వరకు వెలుతుంది.
- మార్గమధ్యలో గ్రామాలకు త్రాగు నీరు కూడా అందించవచ్చని తెలియజేసారు.
- కాలువ నెట్వర్క్ కోసం భూ సేకరణ ఉంటుంది, తద్వారా పరిసరప్రాంతం అభివృద్ధి చేయబడుతుంది. కాలువల కోసం నారాయణపేట జిల్లాలో 2,516 ఎకరాలను సేకరించనున్నట్లు ఆయన పేర్కొన్నారు.
- ఈ ప్రాజెక్ట్ విజయవంతంగా పూర్తయిన తర్వాత వలసదారులు తమ ఇళ్లకు తిరిగివస్తారు. నిర్మాణ సమయంలో మరియు ఈ ప్రాజెక్ట్ పూర్తయిన తర్వాత స్థానిక ప్రజలు పరోక్షంగా ఉపాధి ప్రయోజనాలను పొందుతారు . జిల్లా ఆర్థిక వ్యవస్థ మరియు వాణిజ్యం మెరుగుపడుతుంది మరియు మత్స్య, పశుసంవర్ధక వంటి అనుబంధ రంగాలు ఈ ప్రాజెక్ట్ ద్వారా ప్రయోజనం పొందుతాయి. పర్యాటకం కూడా అభివృద్ధి చెందుతుంది. ఈ ప్రాజెక్ట్ విజయవంతంగా పూర్తి కావడానికి అందరూ సహకరించాలని ఆయన కోరారు.

డాక్టర్ అరవింద్ దూత, పర్యావరణ సలహాదారు, M/s. వేయంట్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్ ప్రజల ముందు ప్రజెంటేషన్ ఇచ్చారు మరియు ఈక్రింది వాటిని తెలియజేసారు:

- M/s. వేయంట్స్ సొల్యూషన్స్ ప్రై. లిమిటెడ్, గురుగ్రామ్, హర్యానా, MoEF & CC, న్యూ ఢిల్లీ ద్వారా 11.10.2017న జారీ చేయబడిన ఆమోదం పొందిన TOR లేఖప్రకారం ఎన్విరాన్మెంట్ ఇంపాక్ట్ అసెస్మెంట్ స్టడీని నిర్వహించింది.
- PM2.5, PM10, SO2 మరియు NOx లకు సంబంధించి గాలి నాణ్యత పర్యవేక్షణను నిర్వహించడానికి ఆరు ప్రదేశాలను ఎంపిక చేయడం ద్వారా గాలి నాణ్యత యొక్క ప్రస్తుత స్థితిని అంచనా వేశారు.
- సౌండ్ లెవల్ మీటర్ ద్వారా సౌండ్ లెవల్ ఆరు ప్రదేశాలలో కొలిచారు.
- మట్టి ప్రాంతం యొక్క భౌతిక మరియు రసాయన లక్షణాలు అధ్యయన ప్రాంతం నుండి తీసుకున్న ఆరు నమూనాలకి సంబంధించి అధ్యయనం చేయబడ్డాయి.
- ఉపరితల మరియు భూగర్భ జలాల భౌతిక, రసాయన మరియు జీవ లక్షణాలను విశ్లేషించడానికి ఆరు ప్రదేశాల నుండి నమూనాలు తీసుకోబడ్డాయి.
- ఈ ప్రాంత క్షేత్ర సర్వే ఆధారంగా మొక్కల ఫైటోసోషియాలజీ మరియు అటవీ వృక్షసంపద యొక్క వైవిధ్యం నిర్ణయించబడ్డాయి. జంతుజాల అధ్యయనాలను నిర్వహించడానికి గ్రామాల వెంబడి వివిధ మార్గాలు గుర్తించబడ్డాయి.
- ప్రతిపాదిత ప్రాజెక్ట్ ప్రజల యొక్కఅవగాహనపై సమాదారాన్ని సేకరించడానికి సామాజికఆర్థికశాస్త్రం పై డేటా సేకరించబడింది. సమాదారాన్ని ధృవీకరించడానికి మరియు జనాభా అంశాలపై డేటాను భర్తీ చేయడానికి ద్వితీయ మూలాల నుండి కూడా డేటా సేకరించబడింది.
- విశ్లేషణ ఫలితాలు:
- 7.20 నుండి 7.65 వరకు pH ఉన్న అన్ని ప్రదేశాలలో నేల తటస్థంగా నుండి కొద్దిగా క్షార లక్షణాలుగా ఉందని నేల విశ్లేషణ ఫలితాలు చూపుతున్నాయి. నేల ఆకృతి ఇసుక బంకమట్టి నుండి మట్టి లక్షణాలుగామారుతుంది. ఉపరితల నేలల్లో లభ్యమయ్యే నత్రజని పరిమాణం133.5 నుండి 185.2 కిలోల/హెక్టార్ల మధ్య ఉంది, తద్వారా అందుబాటులో ఉన్న నత్రజని పరిమాణం నేలలో తక్కువగా

ఉన్నాయని సూచిస్తున్నాయి. అందుబాటులో ఉన్న భాస్వరం పరిమానంహెక్టారుకు 12.1 నుండి 15.9 కిలోల మధ్య ఉంటుంది, తద్వారా అందుబాటులో ఉన్న ఫాస్ఫరస్ నేలలో మధ్యస్థంగా ఉన్నాయని సూచిస్తుంది. ఈ నేల్లో లభ్యమయ్యే పొటాషియం పరిమానం హెక్టారుకు 167.3 నుండి 204 కిలోల మధ్య ఉంటుంది, తద్వారా మాధ్యమం నుండి అధిక పొటాషియం విలువలు ఉన్నాయని సూచిస్తున్నాయి. సేంద్రీయ కర్బన విలువలు 0.49 % నుండి 0.73 % వరకు మారుతుందని, తద్వారా నేలలు తక్కువ నుండి మధ్యస్థ సేంద్రీయ కర్బన విలువలుకలిగి ఉన్నాయని సూచిస్తుంది.

- ఈ ప్రాంతంలో పరిశ్రమలు లేవు మరియు వాహనాల ట్రాఫిక్ సాంద్రత ఆందోళన కలిగించదు. కావున గాలిలో కలుషితాల తివ్రత మరియు SO2: 5-7.4 µg/ m3 అనుమతించదగిన పరిమితి కంటే తక్కువగా ఉంది (PM10: 18.3-49.3 /g/m3; PM2.5: 9.9-26.9 /g/m3; NOx: 7.5-18.3 µg/m3).
- పగలు మరియు రాత్రి సమయంలో శబ్దం స్థాయిలు నిర్దేశిత పరిమితుల్లో ఉన్నాయని శబ్దం పర్యవేక్షణ ద్వారా తెలియబడింది.

- విశ్లేషణ ఫలితాలను, క్లాస్-సి లోతట్టు ఉపరితల జలాల అవది పరిమితులతో పోల్చారు,. పిహెచ్ విలువలు 7.60-8.16 మధ్య ఉంటు మరియు అనుమతించదగిన (6.5-8.5) పరిమితిలో ఉన్నాయి. TDS స్థాయిలు 151 నుండి 248 mg/l వరకు ఉంటు మరియు కావాల్సిన పరిమితి 500 mg/l కంటే తక్కువగా ఉన్నాయి. ఉపరితల నీటి నమూనాలలో క్లోరైడ్స స్థాయి 24.6 నుండి 50 mg/l వరకు ఉంటు మరియు కావాల్సిన పరిమితి 250 mg/l కంటే తక్కువగా ఉంది. సల్ఫేట్ల స్థాయి 18.5 నుండి 37.2 mg/l వరకు ఉంటు మరియు కావాల్సిన పరిమితి 200 mg/l కంటే తక్కువగా ఉంది . నైట్రేట్ స్థాయి 2.6 నుండి 4.1 mg/l మధ్య ఉంటుంది మరియు కావలసిన పరిమితి 45 mg/l కంటే తక్కువగా ఉంటుంది. భూగర్భజలం కావాల్సిన పరిమితుల్లో అన్ని పారామితులను కలిగి ఉంది.

ప్రభావాల మూల్యాంకనం:

- నిర్మాణ కార్యకలాపాల కారణంగా, పరిసర ఉష్ణోగ్రత మరియు తేమపై తాత్కాలిక మరియు నామమాత్ర ప్రభావం ఉంటుంది. ఆపరేషన్ దశలో ప్రాజెక్ట్ ప్రాంతం యొక్క వాతావరణ మరియు శీతోష్ణస్థితిపై ఎలాంటి ప్రభావాన్ని సృష్టించకపోవచ్చు.
- ఆపరేషన్ దశలో భూ వినియోగంలో ఎటువంటి మార్పు ఉండదు. తదుపరి ఉపయోగంలో లేని అనేక ప్రాంతాలలో చెట్లపెంపకం ఉంటుంది.
- ప్రాజెక్ట్ కార్యకలాపాల ఆపరేషన్ దశలో నేల కోత ఉండదు, ఎందుకంటే నిర్మాణ పనులకు సమాంతరంగా ల్యాండ్‌స్కేప్ పునరుద్ధరణ పని కూడా అమలు చేయబడుతుంది.
- ప్రాంతం యొక్క భూగర్భము పై ఊహించిన పర్యావరణ ప్రభావం యొక్క తీవ్రత బలహీనంగా ఉంటుంది మరియు ఊహించిన ప్రభావం పరిధి స్థానికంగా ఉంటుంది. ఆపరేషన్ దశలో ప్రాంతం యొక్క భూగర్భము పై ఎటువంటి ప్రభావం ఉండదు.
- PRLIS వ్యవస్థ అమలు మరియు ఆపరేషన్ జలాశయం నుండి నీరు ప్రవహించడం, కాలువ వ్యవస్థ నుండి నీటినష్టాలు మరియు ఫీల్డ్ అప్లికేషన్ కారణంగా భూగర్భ జలాల పెరుగుదల ఉంటుంది.
- నిర్మాణ దశలో వాహనాల నుండివెలువడే ఉద్గారాలు మరియు బ్లాస్టింగ్ కార్యకలాపాల కారణంగా గాలి నాణ్యతలో తాత్కాలిక మార్పులు భావిస్తున్నారు. పరిసర గాలి నాణ్యతపై ఫలితంగా ప్రభావం NAAQS లో ఉంటుంది.
- నిర్మాణదశలోమాత్రమే శబ్దం స్థాయిలలో తాత్కాలిక పెరుగుదల అంచనా వేయబడింది.

- నిర్మాణ సమయంలో నది/ నీటి వనరులలో స్వల్పంగా పెరిగిన గందరగోళంతో నీటి వనరులపై ప్రభావం ఉంటుంది కానీ నీటి పారదర్శకత దిబ్బతినదు. భూగర్భ జలాల పెరుగుదల మాత్రమే కాకుండా, మొత్తం ప్రాంతంలో భూగర్భ జలాల నాణ్యత కూడా మెరుగుపడుతుంది.
- ప్రాజెక్ట్ జోన్ యొక్క వృక్షసంపద కూర్పు విస్తృతంగా పంపిణీ చేయబడుతుంది మరియు ఆవాసాలకు గణనీయమైన నష్టం ఉండదు. ఏదేమైనా, ప్రాజెక్ట్ కార్యాచరణ కాలంలో ఏదైనా వృక్షసంపదను కోల్పోతే, తగిన సమయంలో పునరుద్ధరించబడుతుంది. నిర్మాణానంతర దశలో ప్రాజెక్ట్ ప్రాంతం యొక్క వృక్షజాల సమృద్ధి అనేక రెట్లు పెరుగుతుంది, ఎందుకంటే గ్రీన్ బెల్ట్, పునరుద్ధరణ మరియు ల్యాండ్‌స్కేపింగ్ కింద ప్లాంటేషన్ పూర్తవుతుంది.
- అంతరించిపోతున్న మరియు ప్రమాదంలో ఉన్న జాతుల ప్రస్తుత ఆవాసాలలో ఎటువంటి మార్పు ఉండదు. ప్రాజెక్ట్ ప్రాంతానికి సమీపంలో వన్యప్రాణుల అభయారణ్యం, జాతీయ ఉద్యానవనం మరియు బయోస్పియర్ రిజర్వ్ కూడా లేదు.
- ప్రాజెక్ట్ కారణంగా ఎటువంటి స్థానభ్రంశం మరియు R&R లేదు.భూ సేకరణకు పరిహారం న్యాయమైన పరిహారం హక్కు మరియు భూ సేకరణ, పునరావాసం & పునరావాసం (RFCTLARR) చట్టం 2013 లో పారదర్శకత మరియు భూ సేకరణ, న్యాయమైన పరిహారం మరియు పారదర్శకత పునరావాసం మరియు పునరావాస నియమాలు 2014 , తెలంగాణ హక్కుప్రకారం ఇవ్వబడుతుంది.

నిర్మాణ దశలో వాయు కాలుష్యం:

నిర్మాణ దశలో వాయు కాలుష్యం ఇంధన దహన, క్షపర్ల నుండి వెలువడే ఉద్గారాలు మరియు వాహనాల కదలిక వలన వస్తుంది.

ఉపశమన చర్యలు:

- తవ్విన పదార్థాల నిల్వను కవర్ చేయడం లేదా ఆఫ్‌సైట్ ప్రదేశంలో ఉంచుతారు.
- నిర్మాణ సామగ్రి నిర్వహణ మరియు సరైన పనితీరు.
- రోడ్ల సరైన మరమ్మత్తు మరియు నిర్వహణ మరియు సమర్థవంతమైన ట్రాఫిక్ నిర్వహణ.
- మట్టి, ఇసుక మరియు ఇతర వదులుగా ఉండే పదార్థాలను రవాణా చేసే ట్రక్కులను కవర్ చేయడం.
- నిర్మాణ ప్రాంతం మరియు పరిసరాలను క్రమం తప్పకుండా ఊడ్వడం మరియు కుచ్చా ఉపరితలం / మట్టి రోడ్లపై నీరు చల్లడం.
- స్టోన్ క్షపర్ల నుండి ఉద్గారాలను నియంత్రించడానికి GI షీట్స్ కవర్, విండ్ బ్రేకర్లు మరియు స్ప్రింక్లర్లు.
- అన్ని కన్వేయర్ బెల్ట్‌లను GC షీట్ల ద్వారా కవర్ చేయాలి. స్క్రీన్ క్లాసిఫైయర్‌లు GC షీట్ల ద్వారా కవర్ చేయబడతాయి.
- CPCB నిబంధనల ప్రకారం DG సెట్‌లకి శబ్ద నియంత్రణ పరికరాలు మరియు స్టాక్‌లుఅమర్చుట.

నిర్మాణ దశలో నీటి కాలుష్యం:

ప్రాజెక్ట్ కాలనీ మరియు వివిధ కార్మిక శిబిరాల నుండి ఉత్పత్తి చేయబడిన మురుగునీరు నిర్మాణ దశలో నీటి కాలుష్యానికి మూలం. మురుగునీటి శుద్ధి కోసం STP అందించాలని ప్రతిపాదించబడింది.

పురపాలక ఘన వ్యర్థాలు:

బయోడిగ్రేడబుల్ వ్యర్థాలను కంపోస్టింగ్, క్రిమి కంపోస్టింగ్ ద్వారా ప్రాసెస్ చేయాలని ప్రతిపాదించారు. రీసైక్లింగ్ ద్వారావ్యర్థాలు తిరిగి పొందడం.

గ్రీన్ బెల్ట్ అభివృద్ధి

ప్రధాన కాలువ ఇరువైపులా పంపిణీ నెట్‌వర్క్ యొక్క సర్వీస్ రోడ్లు మరియు ప్రాజెక్ట్ కాలనీల ఉన్న ప్రాజెక్ట్ ప్రాంతంలో మొక్కలు అభివృద్ధి చేయాలని ప్రతిపాదించబడింది.

ప్రాజెక్ట్ ప్రయోజనాలు:

- ఈ ప్రాజెక్ట్ telangana రాష్ట్రంలోని 6 జిల్లాల్లోని 70 మండలాల్లో 1226 గ్రామాల్లోని, 4,97,976 హెక్టార్ల భూములుకు సాగునీరు అందిస్తుంది.
- ఈ ప్రాజెక్ట్ 6 జిల్లాలకు మరియు హైదరాబాద్ నగరంలో కూడా సురక్షితమైన తాగునీటిని అందిస్తుంది.
- కనీసం 50 లక్షల మంది ప్రజలు సురక్షితమైన తాగునీరు మరియు తమ సాగు ప్రక్రియకు నిరంతరాయ నీటిపారుదల నీటితో ప్రయోజనం పొందుతారు.
- రబీ మరియు ఖరీఫ్ సాగు ప్రక్రియ మెరుగుపడుతుంది మరియు ఉత్పాదకత మెరుగుపడుతుంది, ఎందుకంటే ప్రాజెక్ట్ ప్రభావిత ప్రాంతం కరువు కారణంగా ప్రభావితం కాదు.
- కమాండ్ ఏరియాలో భూగర్భ జలాల పెరుగుదల మెరుగుపడుతుంది.
- వ్యవసాయ ఆధారిత ఉత్పత్తులు మరియు పరిశ్రమలు వృద్ధి చెందుతాయి.
- PRLIS ప్రాజెక్ట్ నిర్మాణ ప్రక్రియలో కనీసం 7000 ఉద్యోగాల కల్పన జరుగుతుంది. ప్రాజెక్ట్ నిర్మాణం మరియు ఆపరేషన్ సమయంలో పరోక్ష ఉద్యోగ ఉత్పత్తి కూడా కనిపిస్తుంది.

ప్రతిపాదిత సాగునీటి ప్రాజెక్టుపై తమ అభిప్రాయాలు, వీక్షణలు, సలహాలను అందించాలని జిల్లా కలెక్టర్ ప్రజలను కోరారు:

1. శ్రీ కె. రామకృష్ణ, కోయిల్కొండ : ఈ ప్రాంతంలో కర్మాగారాలు లేనందున కాలుష్యం లేదని పేర్కొన్నారు మరియు ప్రతిపాదిత నీటిపారుదల ప్రాజెక్టును స్వాగతించారు.
2. శ్రీ శ్రీనివాస్ రెడ్డి నారాయణపేట:నారాయణపేట జిల్లా భౌగోళికంగా ఎత్తులో ఉండడం నీరు లేకపోవడం వల్ల నారాయణపేట ప్రాంతం వెనుకబడిపోయిందని పేర్కొన్నారు. ఈ ప్రాంతం రైతులు మరియు నేత కార్మికులపై ఆధారపడి ఉంది . మేము ప్రాజెక్ట్ అమలులో సహకరిస్తాము మరియు అభివృద్ధిలో భాగస్వాములమవుతామని ఆయన పేర్కొన్నారు.
3. శ్రీ విట్టల్ రావు, రిటైర్డ్. నీటిపారుదల శాఖ ఇంజనీర్: ప్రతిపాదిత ప్రాజెక్ట్ యొక్క ప్రాముఖ్యతను వివరించారు. కృష్ణా నదీ పరీవాహకంలో 68% మహబూబ్‌నగర్, రంగారెడ్డి మరియు నల్గొండ జిల్లాలలో విస్తరించి ఉందని ఆయన పేర్కొన్నారు. ఈ ప్రాంతం అభివృద్ధిలో 50 సంవత్సరాలు వెనుకబడి ఉంది. ప్రతిపాదిత ప్రాజెక్ట్ ఈ ప్రాంతంలో అభివృద్ధిని తీసుకువస్తుంది కాబట్టి అందరూ ప్రాజెక్టుకు మద్దతు ఇవ్వాలని ఆయన పేర్కొన్నారు.
4. శ్రీ కె. భీమ్ రెడ్డి, దామరగిద్ద (V&M) నారాయణపేట:)నారాయణపేట కరువు ప్రభావిత ప్రాంతాలలో ఒకటి మరియు జిల్లా నుండి దాలా మంది ప్రజలు ఇతర ప్రాంతాలకు వలస వెళ్లారని పేర్కొన్నారు. జిల్లా నుండి ప్రజల వలసలను అరికట్టడానికి ప్రాజెక్టును అత్యవసరంగా పూర్తి చేయాలని ఆయన అభ్యర్థించారు.
5. శ్రీ రాజేందర్ గౌడ్, మరికల్ (M) : ప్రతిపాదిత ప్రాజెక్ట్ ప్రజల చిరకాల స్వప్నం మరియు ప్రాజెక్ట్ వల్ల ఎలాంటి పర్యావరణ ప్రభావం లేదని పేర్కొన్నారు . ప్రాజెక్టును త్వరగా పూర్తి చేయాలని ఆయన కోరారు.

6. శ్రీ ఎస్వి రెడ్డి, ప్రధాన కార్యదర్శి, రిటైర్డ్ఇంజనీర్స్ అసోసియేషన్: ఈ ప్రాజెక్ట్ 2010 లో గతంలో ప్రతిపాదించబడినప్పటికీ, కార్యరూపం దాల్చలేదని ఆయన తెలియజేశారు. తాగునీటి కోసం ప్రాజెక్ట్ మొదటి దశ ఇప్పటికి ప్రారంభమైంది. ప్రతిపాదిత ప్రాజెక్ట్ నారాయణపేట జిల్లాలో 1.6 లక్షల ఎకరాలకు సాగునీరు అందిస్తుంది. నీటి కాలువలకు బదులుగా పైపులైన్ నెట్‌వర్క్ ద్వారా నీటి పంపిణీని చేయాలని నీటిపారుదల శాఖకు ఆయన సూచించారు.

7. శ్రీ దామోదర్ రెడ్డి, విరలాపూర్: నారాయణపేట ప్రాంతం అధిక ఎత్తులో ఉండడం మరియు వర్షాధార ప్రాంతం కావడం వల్ల వెనుకబాటుకు గురి అయ్యిందని పేర్కొన్నారు.అతను ప్రాజెక్టు త్వరగా పూర్తి చేయాలని అభ్యర్థించాడు మరియు వారు భూ సేకరణకు సంపూర్ణ మద్దతు ఇస్తామని పేర్కొన్నారు.

8. శ్రీ వెంకటయ్య, మద్దూర్ ప్రాజెక్టును స్వాగతించారు మరియు కనుకుర్తి వద్ద రిజర్వాయర్ ఎర్పాటును అధికారులు పరిశీలించాలని కోరారు.

9. శ్రీ వెంకట్ రెడ్డి, కనుకుర్తి: ప్రాజెక్టును ఆహ్వానించారు మరియు ఈ ప్రాంతాన్ని అభివృద్ధి చేయడానికి తాము పూర్తిగా సహకరిస్తామని పేర్కొన్నారు. నీటి పంపిణీ సమర్థవంతంగా అమలుచేయాలని, ప్రతిపాదిత ప్రాజెక్ట్ కారణంగా ఎలాంటి పర్యావరణ సమస్యలు లేవని పేర్కొన్నారు.

10. శ్రీ లండి శివరామి రెడ్డి, నారాయణపేట: ప్రతిపాదిత ప్రాజెక్ట్ వల్ల ఎలాంటి పర్యావరణ సమస్యలు లేవని పేర్కొన్నారు. ఈ ప్రాంతంలో గణనీయమైన సంఖ్యలో మత్స్యకారులు వున్నారు అందువల్ల ఆ ప్రాంతంలో మత్స్య సంపద అభివృద్ధికి సౌకర్యం కల్పించాలి. మహిళా సంఘాల అభివృద్ధి కోసం పశువులను అందించాలని పేర్కొన్నారు.

11. శ్రీ ఆత్మ రామ్, రిటైర్డ్ఇంజనీర్: ప్రతిపాదిత ప్రాజెక్ట్ యొక్క ప్రాముఖ్యత గురించి మనందరికీ తెలుసునని, అందువల్ల ప్రాజెక్ట్ నిర్మాణం కోసం మనమందరం పూర్తి సహాయాన్ని అందించాలని పేర్కొన్నారు.

12. శ్రీ సాయి రెడ్డి, కొల్లంపల్లి: వారి గ్రామం వెనుకబడిన ప్రాంతం అని మరియు గ్రామ ప్రజలు అధిక సంఖ్యలో బయటికి వలసలు వెళ్తున్నారని పేర్కొన్నారు. వీలైనంత త్వరగా ప్రాజెక్టును పూర్తి చేసి, ప్రజల వలసలను అరికట్టడానికి సాగునీటిని అందించాలని ఆయన అభ్యర్థించారు.

13. శ్రీ మాధవులు, కోయకొండ: ప్రతిపాదిత ప్రాజెక్టుకు తమ సంఘం తరపున పూర్తి మద్దతు ఇస్తున్నామని పేర్కొన్నారు.

14. శ్రీ పాద కులకర్ణి, నారాయణపేట ఇది వెనుకబడిన మరియు కరువుప్రాంతమని పేర్కొన్నారు. ఉపరితల నీరు మరియు భూగర్భ జలాలు పెరిగే విధంగా PRILS ప్రాజెక్ట్ సకాలంలో పూర్తిచేయాలని ఆయన అభ్యర్థించారు . ఇది పశువుల మేత ప్రాంతాన్ని పెంచడానికి మరియు ఇతర జిల్లాలకు పశువుల వలసలను ఆపడానికి సహాయపడుతుంది.

15. శ్రీ సత్య రెడ్డి, ఘర్షపాడు (V) ఈ ప్రాజెక్టుకు తాము పూర్తిగా మద్దతు ఇస్తామని పేర్కొన్నారు.

16. శ్రీ బుర్షపాడు రవికుమార్, అధంగాపూర్ ప్రాజెక్ట్ వల్ల ఎలాంటి పర్యావరణ ప్రభావం లేదని పేర్కొన్నారు మరియు ప్రాజెక్ట్‌ను త్వరగా పూర్తి చేయాలని విన్నవించుకున్నారు.

17. శ్రీ సాంబయ్య, రిటైర్డ్. ముఖ్య ఇంజినీరు:నీటిపారుదల శాఖ, అతను ఇంతకు ముందు గోదావరి మరియు కృష్ణా డెల్టా ప్రాంతంలో పనిచేశానని మరియు ప్రతిపాదిత ప్రాజెక్ట్ వల్ల ఈ ప్రాంతం అభివృద్ధి చెందుతుందని మరియు ప్రాజెక్ట్ వల్ల ఎలాంటి పర్యావరణ ప్రభావం ఉండదని పేర్కొన్నారు .

18. శ్రీ సంజీవయ్య, పాల్వల్లి :ప్రాజెక్ట్ వల్ల ఎలాంటి పర్యావరణ ప్రభావం లేదని పేర్కొన్నారు . వారి గ్రామం వ్యవసాయం ఆధారితమైనది కాబట్టి, ప్రాజెక్ట్ త్వరగా పూర్తి చేయాలని కోరారు. ఇది వారి అభివృద్ధికి దోహదపడుతుందని పేర్కొన్నారు.

19. శ్రీ గారి సతీష కుమార్, మణికొండ ప్రతిపాదిత ప్రాజెక్టుకు తాము పూర్తి మద్దతు అందిస్తున్నామని పేర్కొన్నారు.

20. శ్రీ జి. శివ కుమార్, ధన్వాడ : ప్రతిపాదిత ప్రాజెక్ట్ కోసం పూర్తి మద్దతును అందిస్తున్నట్లు పేర్కొన్నారు. గడువులోగా పూర్తి చేస్తే ప్రాజెక్ట్ చాలా ఉపయోగకరంగా ఉంటుందని పేర్కొన్నారు.

21. శ్రీ సాయి కుమార్, నారాయణపేట: ప్రతిపాదిత ప్రాజెక్ట్ వల్ల నీటిని ఎక్కువ దూరం నుండి తీసుకురావాల్సి వస్తుందని, అధిక వ్యయంతో కూడిన పనిఅని ఆయన తెలియజేశారు. జిఒ నంబర్ 69 అమలు చేయడం ద్వారా నారాయణపేట కు 40 కిమీ దూరంలో ఉన్న కృష్ణ నది నుండి కూడా అదే చేయవచ్చనిపేర్కొన్నారు.

22. శ్రీ వెంకటయ్య, తిరుమలాపూర్ : వారి ప్రాంతంలోని మొత్తం 31 సంఘాలు ప్రతిపాదిత ప్రాజెక్టుకు పూర్తిగా మద్దతు ఇస్తున్నట్లు పేర్కొన్నారు. తమ గ్రామానికి రిజర్వాయర్ అందించాలని ఆయన కోరారు.

23. శ్రీ ఏటప్ప, ధామరగిద్ద: మత్స్య, వ్యవసాయం మరియు సాంప్రదాయ స్థానిక వృత్తుల అభివృద్ధికి ఈ ప్రాజెక్ట్ సహాయపడుతుందని, ఈ ప్రాజెక్టుకు పూర్తి మద్దతు ఇస్తామని పేర్కొన్నారు .

24. శ్రీ బి రాములు శేర్నపల్లి : వారి మండలంలోని 21 గ్రామాలు ఈ ప్రాజెక్ట్ పరిధిలోకి వస్తాయని మిగతా గ్రామాలను కూడా ప్రాజెక్ట్ పరిధిలోకి తీసుకరావాలిందిగా పేర్కొన్నారు. వారు ప్రతిపాదిత ప్రాజెక్ట్ కోసం పూర్తి మద్దతును అందిస్తామని మరియు ప్రాజెక్ట్ పనులను త్వరగా పూర్తి చేయాలని అభ్యర్థించారు.

25. M రాములు కోటకొండ: ప్రతిపాదిత ప్రాజెక్ట్ లో ఎక్కువ దూరం నుండి నీటిని తీసుకురావాల్సి వస్తుందని పేర్కొన్నారు. నారాయణపేటకు 40 కిలోమీటర్ల దూరంలో ఉన్న కృష్ణ నది నుండి కూడా అదే చేయవచ్చని పేర్కొన్నారు . తమ గ్రామంలో ఉన్న పెద్ద చెరువుకు లిఫ్ట్ ఇరిగేషన్ సౌకర్యం కల్పించాలని ఆయన అభ్యర్థించారు. ప్రాజెక్ట్ వల్ల పర్యావరణ ప్రభావం లేదని పేర్కొన్నారు.

26. శ్రీ వి. చక్రవర్తి, రమణపల్లి తండా : వారు ప్రతిపాదిత ప్రాజెక్టుకు పూర్తిగా మద్దతు ఇస్తున్నట్లు పేర్కొన్నారు.

27. శ్రీ కిషన్ రావు, దామరగిద్ద : ప్రతిపాదిత ప్రాజెక్టుకు తాము పూర్తిగా మద్దతు ఇస్తున్నామని పేర్కొన్నారు.

28. శ్రీమతి. బండి రాజేశ్వరి, నారాయణపేట: ప్రాజెక్ట్ యొక్క పర్యావరణ ప్రభావానికి ఎటువంటి అభ్యంతరం లేదు మరియు వారు ప్రతిపాదిత ప్రాజెక్ట్‌కు పూర్తిగా మద్దతు ఇస్తున్నామని పేర్కొన్నారు.

29. శ్రీ తిరుపతయ్య, మరికల్ : ప్రతిపాదిత ప్రాజెక్ట్ వల్ల పచ్చదనం పెరుగుతుందని పేర్కొన్నారు. ఇది గొర్రెల కాపరి సమాజానికి వారి గొర్రెలు & మేకలను మేపడానికి సహాయపడుతుంది మరియు వాటి అభివృద్ధికి దారితీస్తుందని పేర్కొన్నారు.

30. శ్రీ జి. ఆశన్న, ధామరగిద్ద : తమ మండలంలోని 16 గ్రామాలు మాత్రమే ఈ ప్రాజెక్ట్ పరిధిలోకి వస్తాయని పేర్కొన్నారు. తమ మండలంలోని ఇతర గ్రామాలకు కూడా నీరు అందించాలని ఆయన అభ్యర్థించారు. వారి ప్రాంతం నుండి ప్రజల వలసలను ఆపడానికి ఈ ప్రాజెక్ట్ దోహదపడుతుందన పేర్కొన్నారు.

31. శ్రీ కె. హనుమంత్, ఎలిగండ్ల : చిన్న మరియు సన్నకారు రైతుల నుండి భూ సేకరణను తప్పించమని అభ్యర్థించారు. భూస్వాములనుండి భూసేకరణ పారదర్శకంగా జరగాలని ఆయన పేర్కొన్నారు . వారు ప్రాజెక్టుకు పూర్తిగా మద్దతు ఇస్తామని పేర్కొన్నారు.

32. శ్రీ రాజ్యవర్ధన్ రెడ్డి, జిన్నారం చాలా తక్కువ వర్షపాతంతో తమ ప్రాంతం పొడిగా ఉందని మరియు ప్రజల వలసలు ఉన్నాయని పేర్కొన్నారు. ఈ ప్రాజెక్ట్ గురించి ఎమ్మెల్యేలతో చర్చించి, వీలైనంత త్వరగా ప్రాజెక్ట్ పూర్తి చేయడానికి ప్రయత్నించాలని ఆయన అభ్యర్థించారు. వారు ప్రాజెక్టుకు పూర్తిగా మద్దతు ఇస్తామని పేర్కొన్నారు.

33. శ్రీ నాగరాజు, నారాయణపేట: ప్రజల పోరాటం మరియు కృషి ద్వారా తెలంగాణ రాష్ట్రం సాధించబడిందని పేర్కొన్నారు. అందువల్ల, ఈ ప్రాంతంలో అభివృద్ధి జరగడానికి మేము ప్రాజెక్టుకు పూర్తిగా మద్దతు ఇస్తామని, ప్రాజెక్ట్ వల్ల పర్యావరణ ప్రతికూల ప్రభావం లేదని పేర్కొన్నారు.

34. శ్రీ రాజేష్, నారాయణపేట : ప్రతిపాదిత ప్రాజెక్ట్ తెలంగాణ ఉద్యమ ఫలితమని పేర్కొన్నారు. వారు ప్రాజెక్టుకు పూర్తిగా మద్దతు ఇస్తామని, ప్రాజెక్ట్ వల్ల పర్యావరణ ప్రతికూల ప్రభావం లేదని పేర్కొన్నారు.

35. కె. చంద్రశేఖర్, ధన్వాడ : తమ మండలంలోని 9 గ్రామాలు మాత్రమే ఈ ప్రాజెక్ట్ పరిధిలోకి వస్తాయని పేర్కొన్నారు. మిగిలిన గ్రామాలను కూడా ఈ ప్రాజెక్టులో చేర్చమని ఆయన అభ్యర్థించారు. గండి చెరువుకు లిఫ్ట్ ఇరిగేషన్ అందించాలని ఆయన కోరారు, ఎందుకంటే ఇది తమ ప్రాంతంలో వ్యవసాయానికి ఎక్కువ నీటిని అందిస్తుందని అతను తెలియజేసారు.

36. శ్రీ హన్మి రెడ్డి, మరికల్: ఈ ప్రాజెక్ట్ కోసం పూర్తి మద్దతు అందిస్తామని పేర్కొన్నారు.

కలెక్టర్ & జిల్లా మేజిస్ట్రేట్, నారాయణపేట జిల్లా ప్రజల అభిప్రాయాలు, వీక్షణలు, సూచనలు మరియు ప్రజలు సమర్పించిన ప్రాతినిధ్యాలు నమోదు చేయబడ్డాయని మరియు వాటన్నిటిని కేంద్ర ప్రభుత్వానికి పంపబడుతుందని తెలియజేసారు.

ఈ సమావేశంలో పాల్గొని వారి అభిప్రాయాలు, సూచనలు & వీక్షణలును పంచుకున్నందుకు ప్రజలు, ప్రజా ప్రతినిధులు, నిపుణులు, MPTC లు, ZPTC లు, సర్పంచ్, రైతు సహకార సంఘాలు, మత్స్యకారుల సొసైటీలందరికి కలెక్టర్ & జిల్లా మేజిస్ట్రేట్ కృతజ్ఞతలు తెలిపారు.

కలెక్టర్ & జిల్లా మేజిస్ట్రేట్, నారాయణపేట జిల్లా పర్యావరణ ప్రజాభిప్రాయ సేకరణ కార్యక్రమానికి ధన్యవాదాలు తెలియజేస్తు ముగించారు.

నారాయణపేట జిల్లాలో ప్రాజెక్టు అమలుకు అత్యధిక ప్రజల మెజారిటీ మద్దతు ఉంది. కేవలం 2-3 అభిప్రాయాలు మరియు వ్రాతపూర్వక అభ్యర్థనలు మాత్రమే, రాష్ట్ర ప్రభుత్వం యొక్క మరొక ప్రాజెక్ట్ మరియు భూ సేకరణ సమస్యలకు సంబంధించినవి ప్రస్తుత విషయానికి సంబంధించినవి కావు.

పర్యావరణ ప్రజాభిప్రాయ సేకరణ సమయంలో అందుకున్న ప్రాతినిధ్యాలు ప్రతిగ జతచేయబడ్డాయి.

పర్యావరణ ప్రజాభిప్రాయ సేకరణ లో పాల్గొన్న ప్రజల బాటా మరియు మొత్తం ప్రొసీడింగ్‌ల వీడియో గ్రాఫ్ కూడా జోడించబడింది.

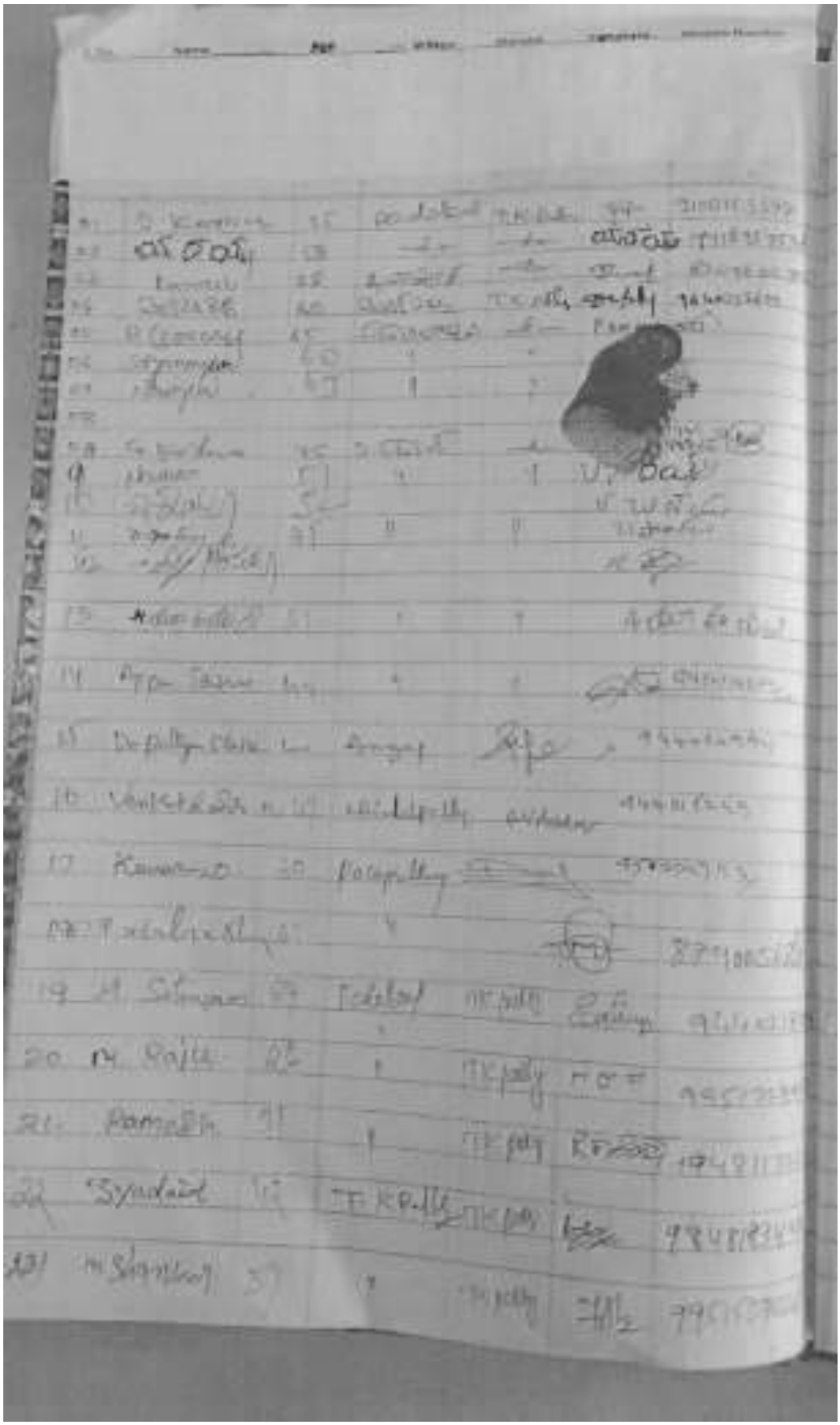
12/10/21

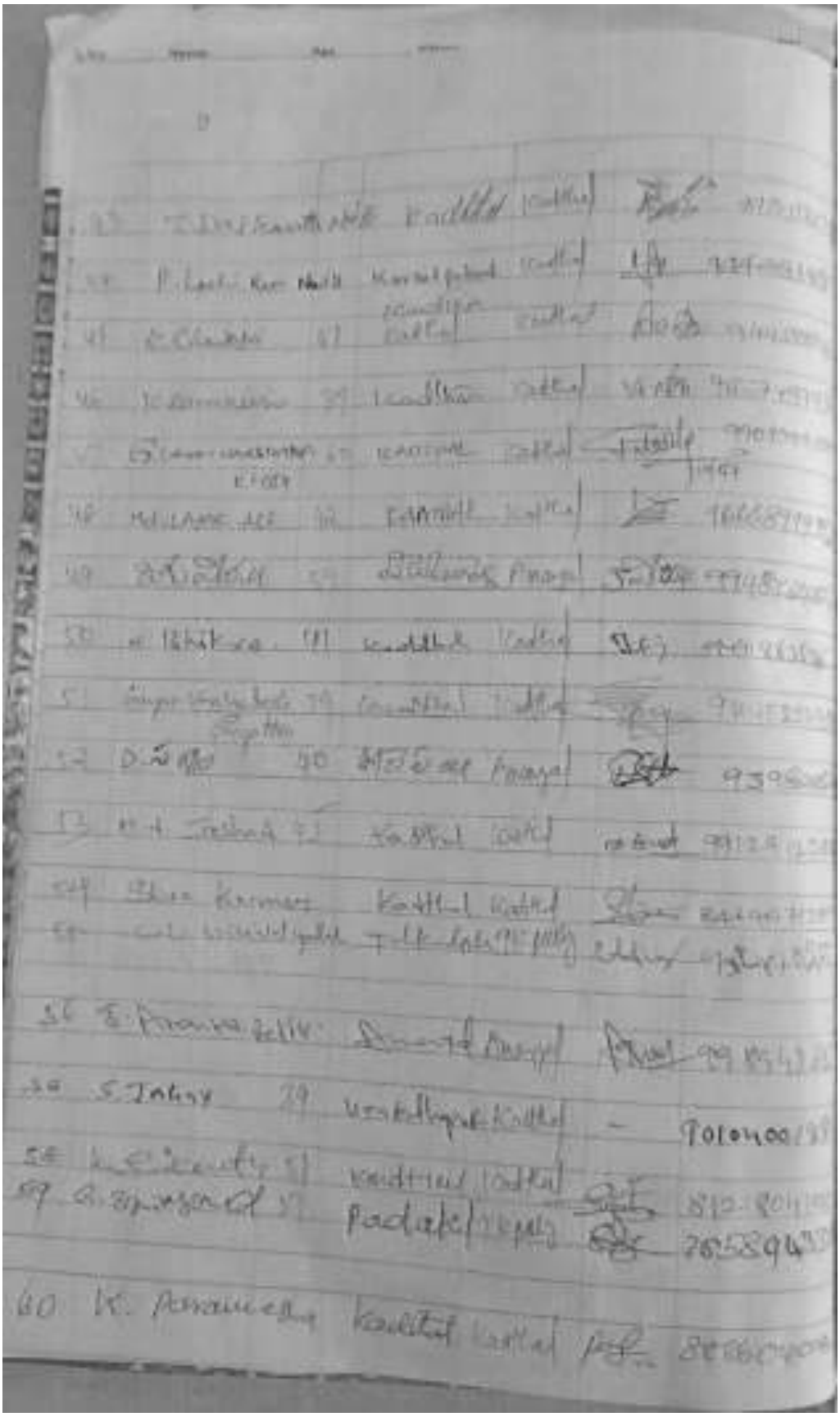
కుమార్ పాఠక్
పర్యావరణ ఇంజనీర్
TS కాలుష్య నియంత్రణ మండలి
ప్రధాన కార్యాలయం, హైదరాబాద్.

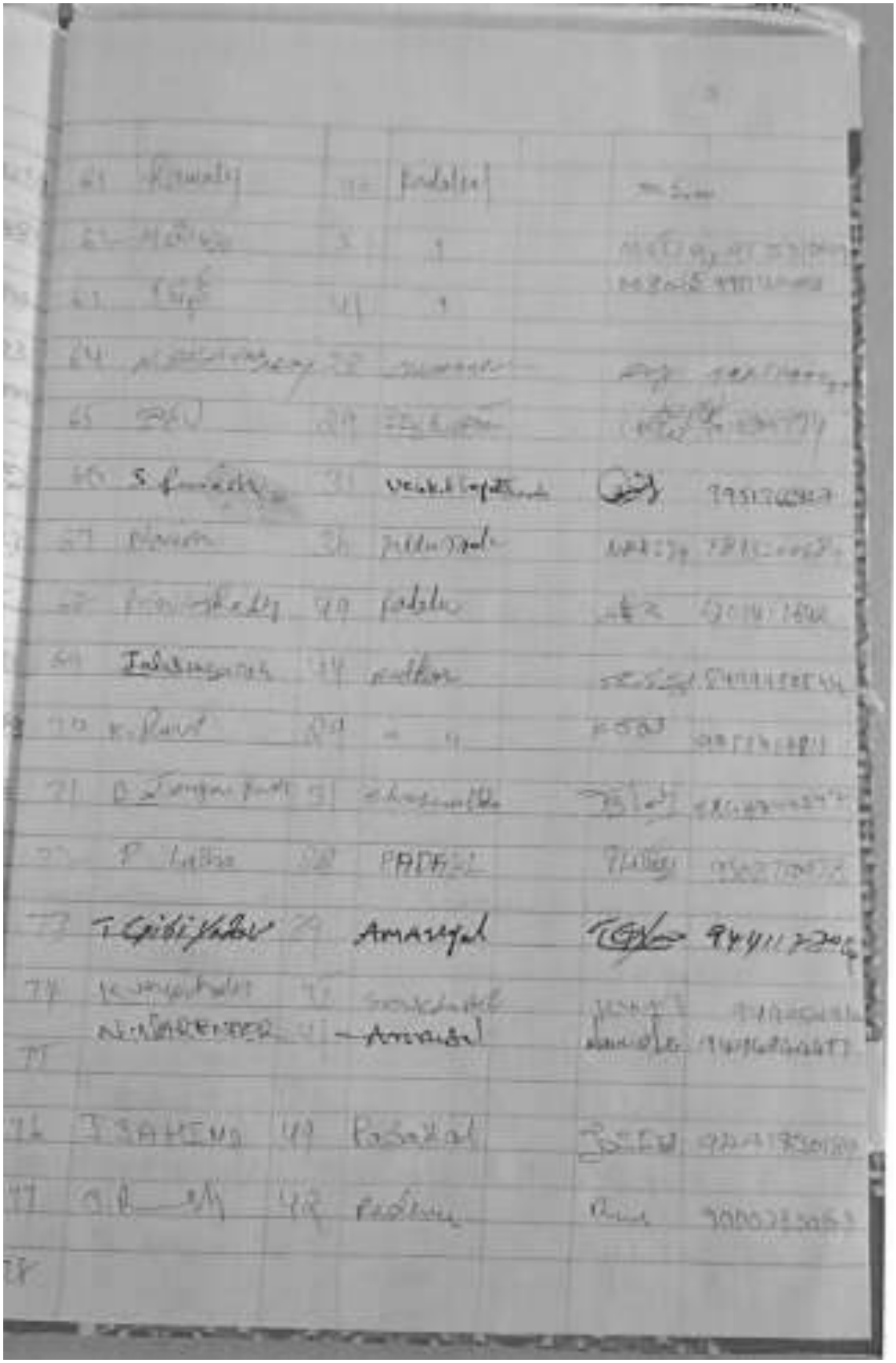
శ్రీమతి. హరి చందన దాసరి, IAS,
జిల్లా కలెక్టర్ & మెజిస్ట్రేట్
నారాయణపేట జిల్లా.

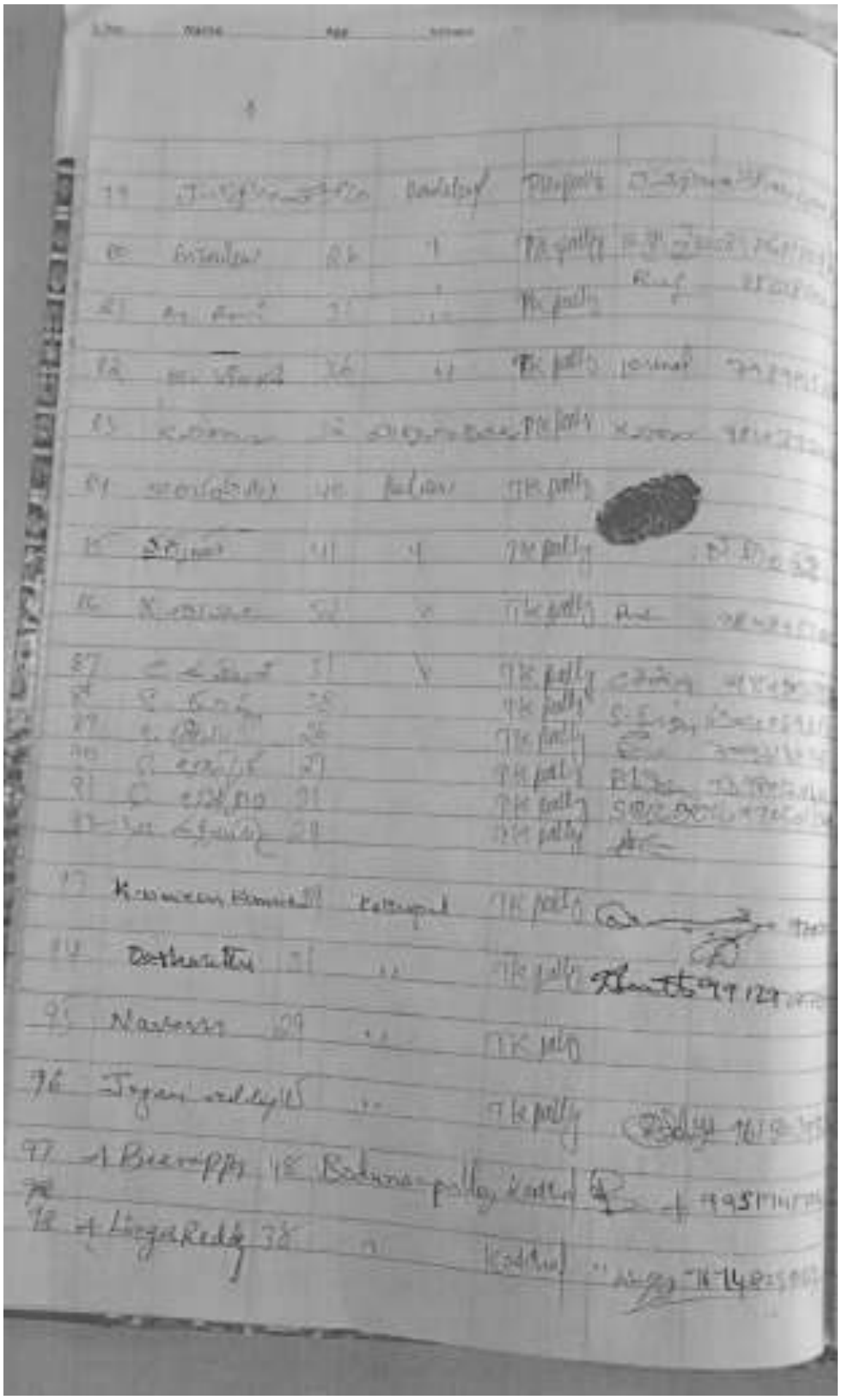
Public Hearing Attendance Sheet

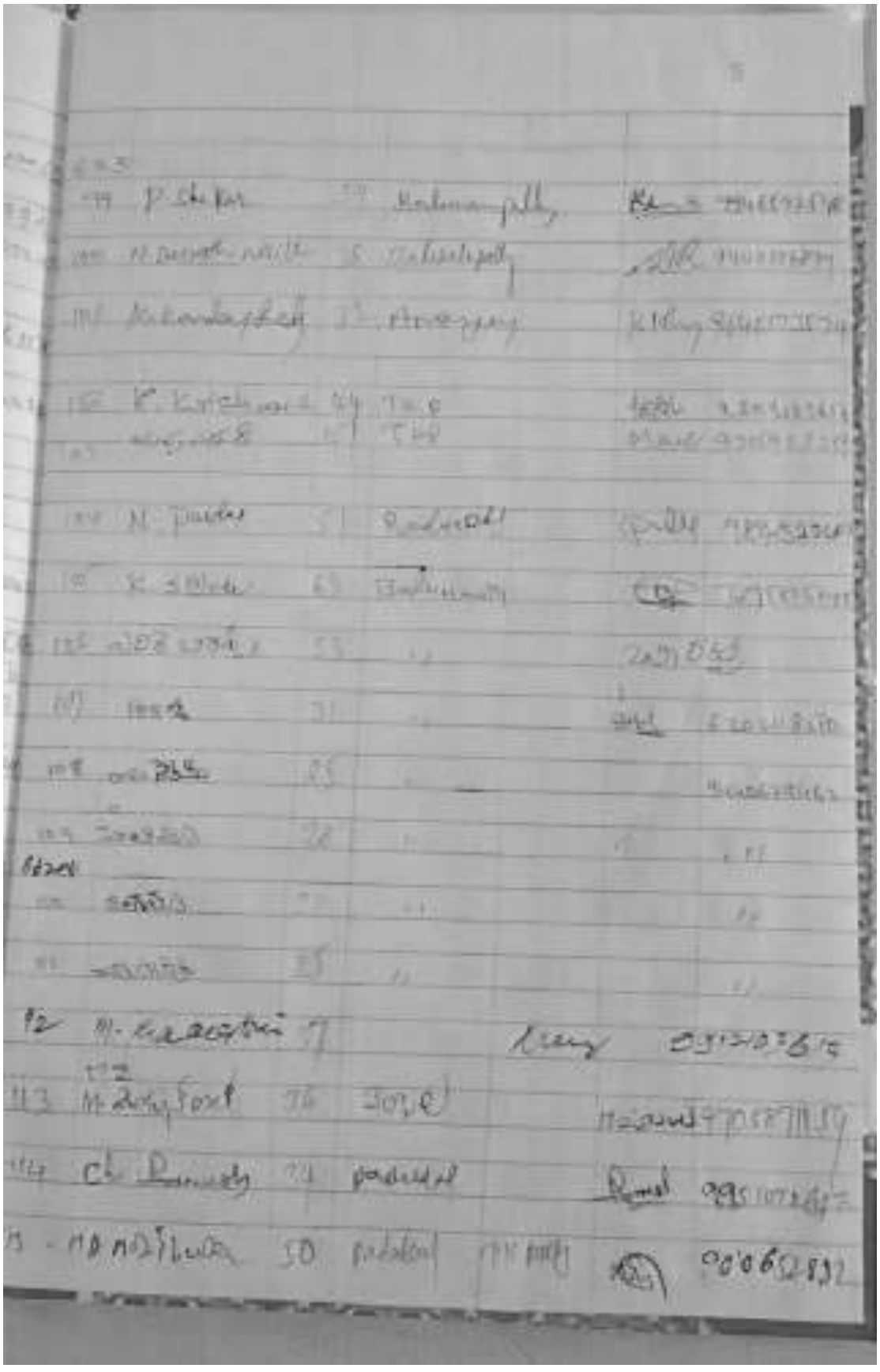
Rangareddy

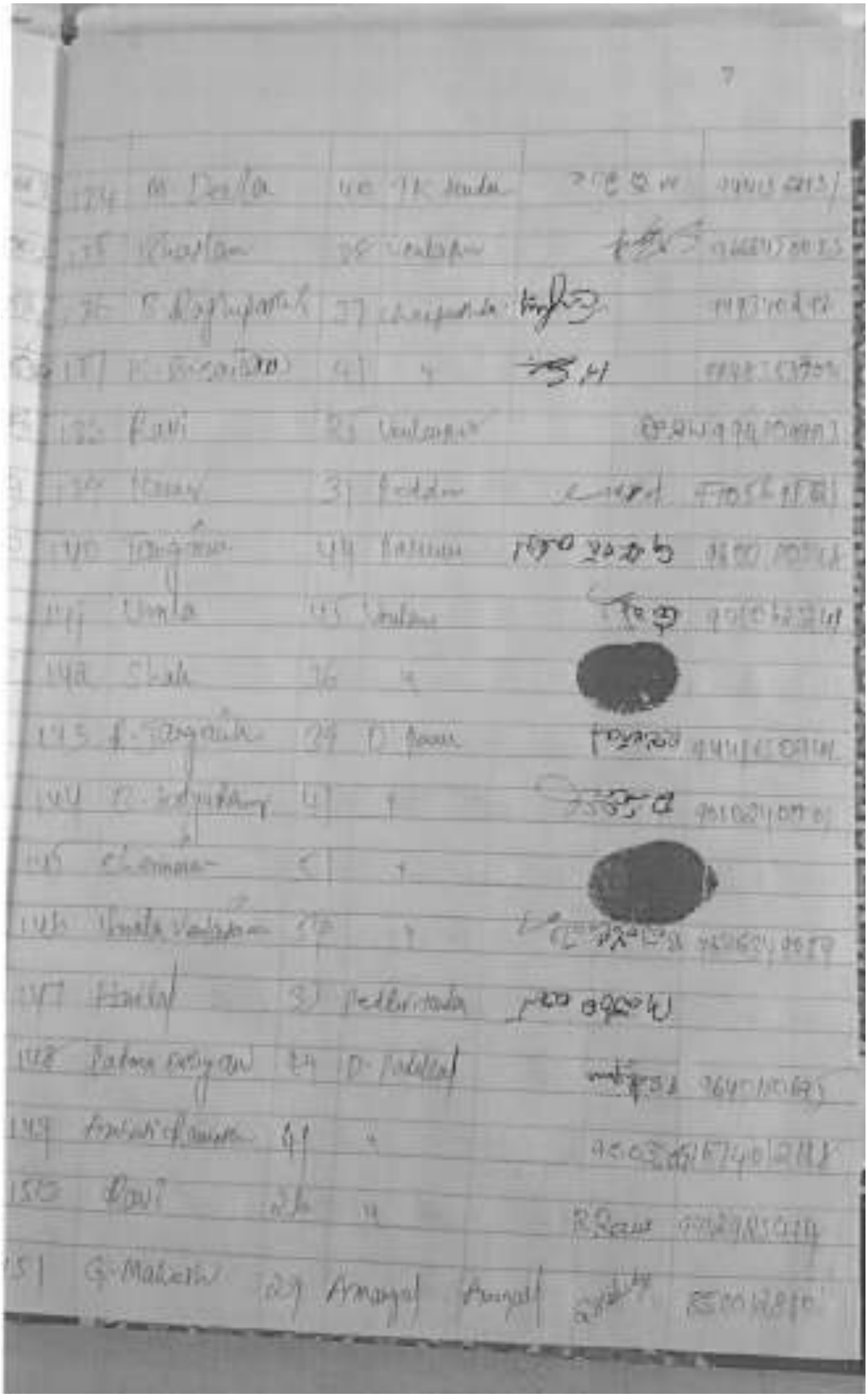












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186	[illegible]		[illegible]	[illegible]
187	M. [illegible]	45	[illegible]	[illegible]
188	M. [illegible]	30	[illegible]	[illegible]

189	G Padalakrishna	49	Chadalavada	TK Palli	
190	B Ramakrishna	58	Chandrakona	Nagaram	
191	K Rangaiah	40	Podalakuru	Nellore	
192	Venkaiah	46	Nandalamadaka	TK Palli	
193	B Kondaiah	30	Podalakuru	TK Palli	
194	M Nagabhushanam	40	Chennur	TK Palli	
195	Ramana Reddy	38	Venkampalli	TK Palli	
196	G Anjaiah	38	Venkampalli	TK Palli	
197	Narayana	60	Podalakuru	TK Palli	
198	T Ramaiah	56	Podalakuru	TK Palli	
199	Koteswara Rao	60	Podalakuru	TK Palli	
200	Venkata Reddy	58	Chandragiri	TK Palli	
201	Ramalinga Reddy	45	Rajakandrigunta	TK Palli	
202	Balakrishnaiah	65	Amaravathi	Amaravathi	
203	Y Venkaiah	50	Vellore	Vellore	
204	M Damodar	50	Ramireddipalli	TK Palli	
205	D Raghavaiah	55	Venkatachalapuram	TK Palli	
206	T Ramireddy	52	Ramireddipalli	TK Palli	

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210	MD [illegible]	28	[illegible]	[illegible]
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212	K. [illegible]	34	[illegible]	[illegible]
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214	[illegible]	45	[illegible]	[illegible]
215	[illegible]	28	[illegible]	[illegible]
216	[illegible]	50	[illegible]	[illegible]
217	[illegible]	40	[illegible]	[illegible]
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219	A. [illegible]	5	[illegible]	[illegible]
220	M. D. [illegible]	50	[illegible]	[redacted]
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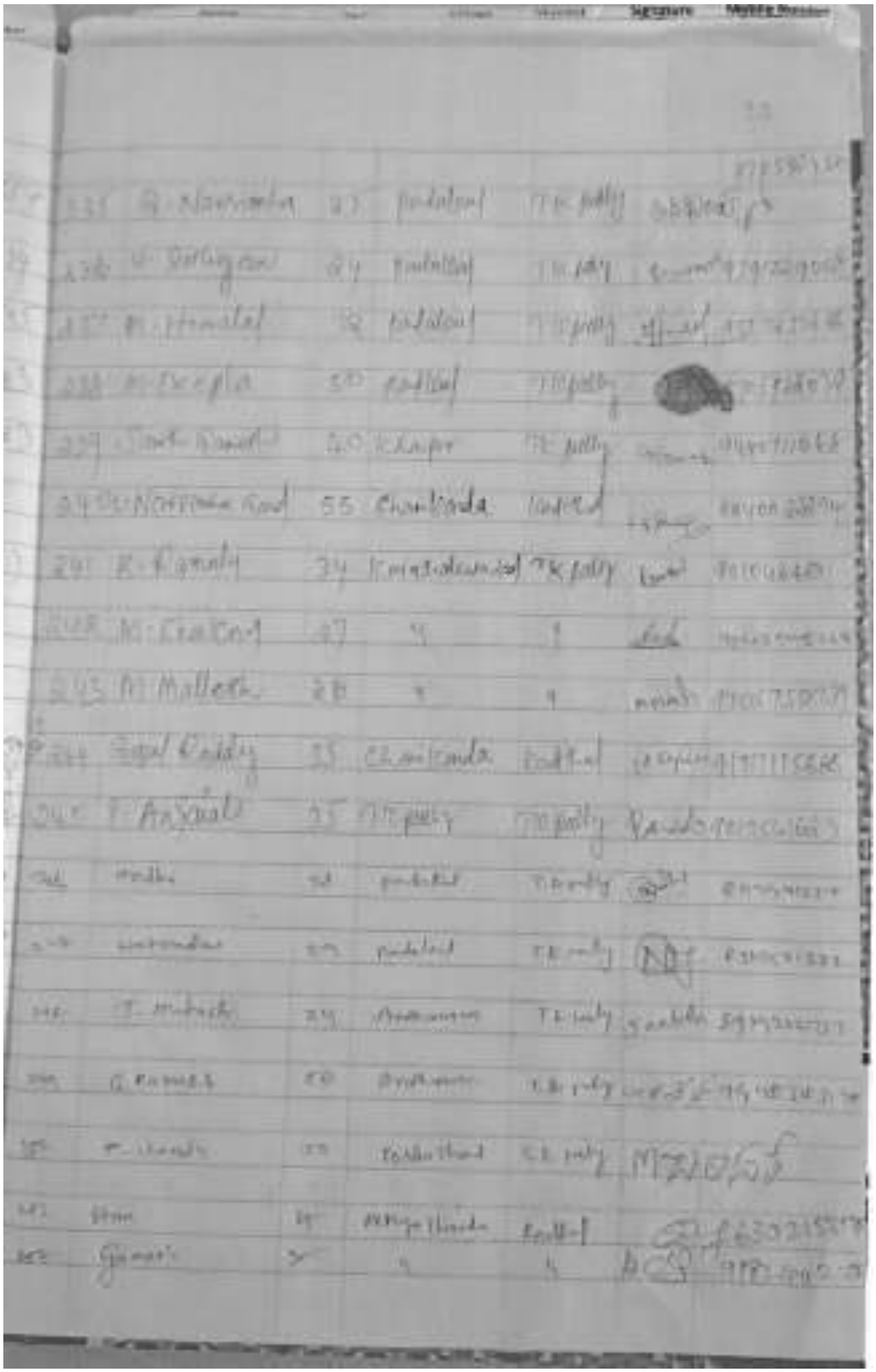

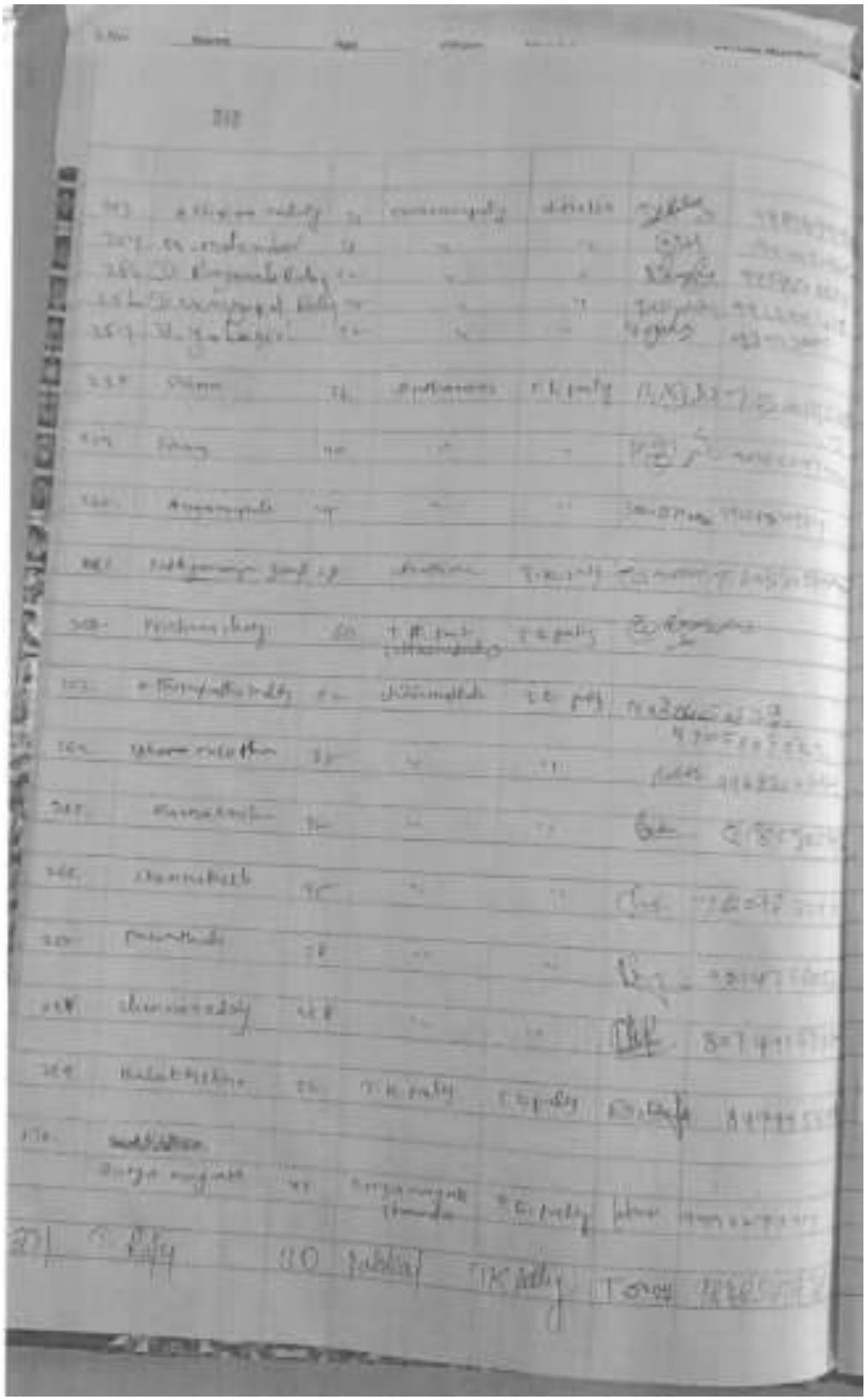

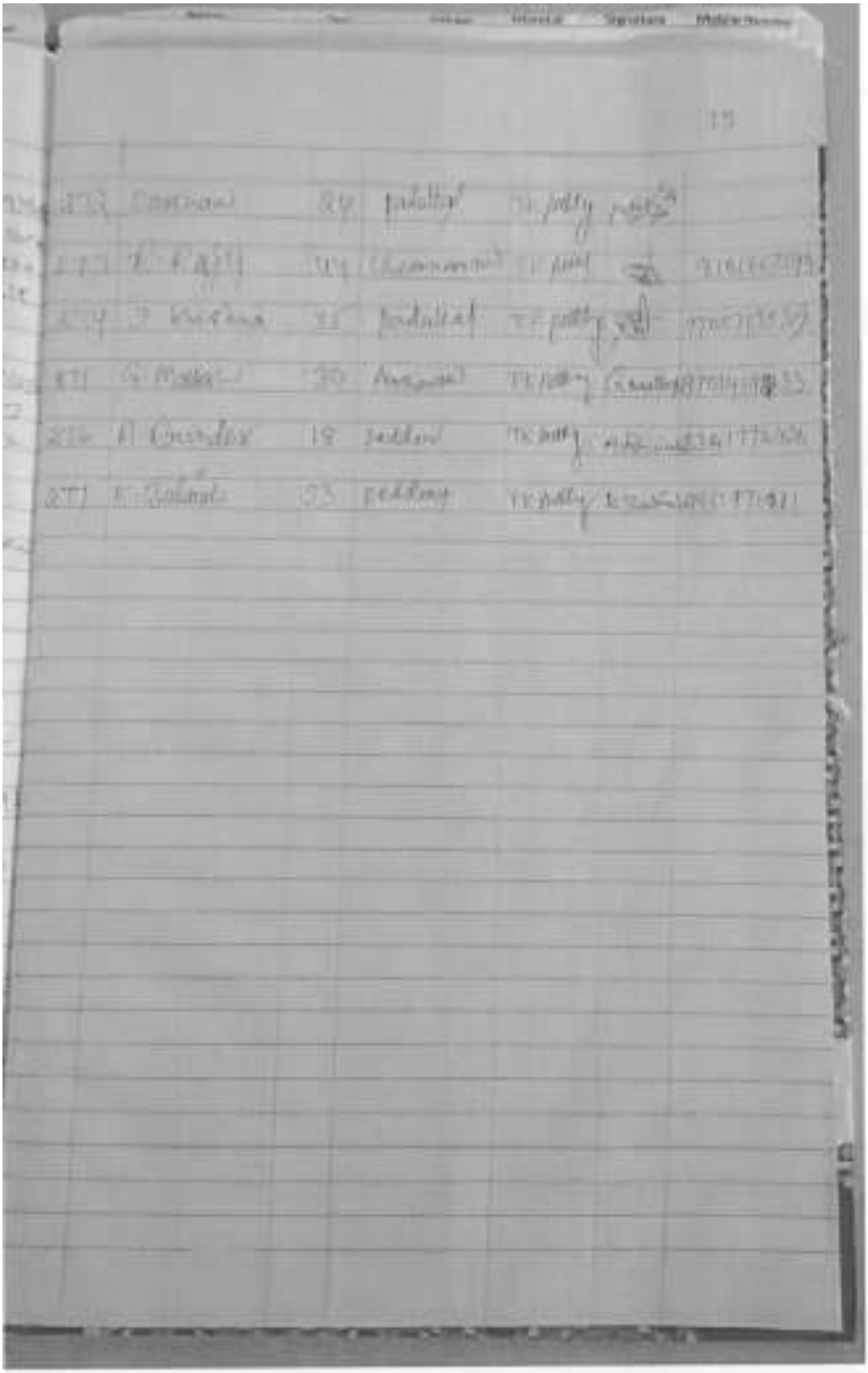

1	D Anuj Kumar	GAD		
2	G. Satyanarayana Reddy	SE/DWSabha		
3	M. Venkata	ES ITDA		
4	E Venkateshwarlu	ADE, Kanigiri		
5	B. Pama Sahadev	AE / MPDO		
6	E. Murali	EO / PRI / VRO		
7	K.P. Jyothi	Tahsildar		
8	[illegible]	VRO		
9	P. Sujatha	VRO		
10	[illegible]	[illegible]		
11	Ch. Nalgonda	Tahsildar & Addl. Mag.		
12	B. Srinivasa Reddy	Instructor Collector		
13	K. Rajasekhar	DEO / APC		
14	I. M. Vara Prasad	DEO / DPM		
15	G. Srinivasulu	AE / Rural		
16	K. Sreenivasa Reddy	AE		
17	S. Radhakrishna	[illegible]		

Minutes of Meeting-Public Hearing

Rangareddy

తెలంగాణ ప్రభుత్వము నీటిపారుదల మరియు ఆయకట్టు అభివృద్ధి విభాగము వారిచే ప్రతిపాదించబడిన పాలమూరు రంగారెడ్డి ఎత్తి పోతల పథకం మరియు కెనాల్ నెట్ వర్క్ (PRLIS) ఫేస్-II నిర్మాణము గురించి తేది 10.08.2021న ఉదయం 11.00 గంటలకు వెంకటేశ్వర ఫంక్షన్ హాల్, తలకొండపల్లి (V) & (M) రంగారెడ్డి జిల్లాలో జరిగిన పర్యావరణ ప్రజాభిప్రాయ సేకరణ యొక్క మినిట్స్

ఈ క్రింది పబ్లిక్ హీయరింగ్ సభ్యులు హాజరు అయినారు:

క్రమ సంఖ్య	ప్యానెల్ మెంబర్ పేరు	హోదా
1	శ్రీ అమోయ్ కుమార్ IAS జిల్లా కలెక్టర్ & జిల్లా మేజిస్ట్రేట్ రంగారెడ్డి జిల్లా	జిల్లా కలెక్టర్ & జిల్లా మేజిస్ట్రేట్ రంగా రెడ్డి జిల్లా
2	శ్రీ M. వెంకన్న, పర్యావరణ ఇంజనీర్ టి.ఎస్. కాలుష్య నియంత్రణ మండలి, ప్రాంతీయ కార్యాలయము-1, రంగారెడ్డి జిల్లా	తెలంగాణ రాష్ట్రం కాలుష్య నియంత్రణ మండలి యొక్క ప్రతినిధి.

తెలంగాణ ప్రభుత్వము నీటి పారుదల మరియు ఆయకట్టు అభివృద్ధి విభాగము యొక్క ఈ క్రింది ప్రతినిధులు మరియు ఇతర అధికారులు హాజరు అయినారు.

క్రమ సంఖ్య	పేరు మరియు హోదా
1	శ్రీ A. సత్యనారాయణ రెడ్డి , SE, నీటి పారుదల & ఆయకట్టు అభివృద్ధి విభాగము, PRLIS, హైదరాబాద్
2	శ్రీ G. లక్ష్మీపతి నాయుడు , AGM, IP&D, M/s. వోయంట్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్, హైదరాబాద్.

మొట్ట మొదటిగా తెలంగాణ ప్రభుత్వము నీటిపారుదల మరియు ఆయకట్టు అభివృద్ధి విభాగము వారిచే ప్రతిపాదించబడిన పాలమూరు రంగా రెడ్డి ఎత్తి పోతల పథకం మరియు కెనాల్ నెట్ వర్క్ (PRLIS) ఫేస్-II నిర్మాణము గురించి తేది 10.08.2021న ఉదయం 11.00 గంటలకు వెంకటేశ్వర ఫంక్షన్ హాల్, తలకొండపల్లి (V) & (M) రంగారెడ్డి జిల్లాలో జరిగిన పర్యావరణ పబ్లిక్ హీయరింగ్ కు హాజరైన వారిని, ప్రజా ప్రతినిధులను మరియు ఇతర అధికారులను, రంగారెడ్డి జిల్లా TSPCB ప్రాంతీయ కార్యాలయము యొక్క పర్యావరణ ఇంజనీరు ఆహ్వానించారు. జిల్లా కలెక్టర్, రంగా రెడ్డి జిల్లా గారిని డయాస్ మీదకు ఆహ్వానించి, పర్యావరణ ప్రభావిత అంచనా నోటిఫికేషన్ (EIA), 2006 పర్యావరణ మంత్రాలయము, అటవీ శాఖామరియు వాతావరణ మార్పు , భారత ప్రభుత్వము వారు జారీచేసిన పద్దతి ప్రకారము పబ్లిక్ హియరింగ్ ను నిర్వహించమని కోరినారు. తేది 14-09-2006 నాటి పర్యావరణ ప్రభావిత అంచనా నోటిఫికేషన్ నెం. 1533 (EIA), 2006 S.O. (E) యొక్క విశిష్ట లక్షణాలను మరియు సమయానుకూలంగా చేసిన సవరణలు వివరిస్తూ, పర్యావరణ ప్రభావిత అంచనా నోటిఫికేషన్ 2006 ప్రకారం పాలమూరు రంగారెడ్డి ఎత్తిపోతల పథకం (PRLIS) ఒక ప్రాజెక్ట్ గా, నది ప్రవాహ ప్రాజెక్ట్ ల జాబితాలోని క్రమ సంఖ్య 1C (ii) లో A కేటగిరికి చెందినదని, ఆయన అన్నారు. ఈ పబ్లిక్ హియరింగ్ గురించిన సమాచారము, తెలుగు వార్తా పత్రిక అయిన 'నమస్తే తెలంగాణ ' మరియు 'తెలంగాణ టుడే' ఇంగ్లీష్ వార్తా పత్రిక లలో తేది 10.07-2021 న ప్రచురించబడినది అని ఆయన అన్నారు. ప్రజలు సమాచారాన్ని పొందుకొనుటకు కార్యనిర్వాహక సారాంశం తో కూడిన పర్యావరణ ప్రభావిత అంచనా (EIA) యొక్క ముసాయిదా నివేదిక తెలుగు ఇంగ్లీషు లో ప్రాజెక్ట్ గురించి స్థానిక సంస్థల కార్యాలయములలో మరియు కల్లెక్టరేట్ లో ప్రదర్శించబడినది. ప్రతిపాదించబడిన ప్రాజెక్ట్ గురించి ఏవైనా సలహాలు, సూచనలు మరియు అభ్యంతరాలు ఉన్న ఎడల వాటిని తెలుసుకొనుట కొరకు ఈ పర్యావరణ పబ్లిక్ హియరింగ్ నిర్వహించబడినది. వ్యాఖ్యానించుటకు ఉద్దేశించిన వారిని క్రమ పద్దతిలో పిలుచుట కొరకు వారికి ఇవ్వబడిన స్లిప్ లో వారి పేర్లు వ్రాసి ఇవ్వమని అతను కోరినారు. మొత్తం ప్రొసీడింగ్స్ వీడియోలో రికార్డ్ చేయబడుతుంది మరియు పారదర్శకంగా ఎటువంటి ఎడిటింగ్ లేకుండా ఉంటుంది , తద్వారా అది తదుపరి చర్య తీసుకొనుట కొరకు

ఉన్నతాధికారులకు పంపించబడుతుందని ఆయన అన్నారు. తదుపరి అతను కలెక్టర్ , రంగారెడ్డి జిల్లా గారిని పబ్లిక్ హియరింగ్ యొక్క ప్రొసీడింగ్స్ నిర్వహించమని కోరినారు.

పబ్లిక్ హియరింగ్ కు చేరి వచ్చిన వారిని ఆహ్వానిస్తూ, **శ్రీయుత జిల్లా కలెక్టర్ మరియు జిల్లా మేజిస్ట్రేట్ రంగారెడ్డి జిల్లా వారు** సమావేశం యొక్క నియమాలు పాటించవలెనని కోరినారు. పాలమూరు రంగారెడ్డి ఎత్తిపోతల పథకం (PRLIS) కొరకు పర్యావరణ శాఖ అనుమతులు పొందుట కొరకు పబ్లిక్ హియరింగ్ చాల అవసరమని అందుకు వచ్చిన వారు ప్రతిపాదించబడిన ప్రాజెక్ట్ గురించి వారి యొక్క సలహాలు , సూచనలు మరియు అభ్యంతరాలు ఏవైనా ఉన్న ఎడల స్వేచ్ఛగా వ్యక్త పరచమని కోరినారు. I&ఆయకట్టు అభివృద్ధి విభాగము యొక్క ప్రతినిధులు ప్రదర్శన ఇచ్చిన తర్వాత, హాజరైన వారిని వారి ఉద్దేశించిన సలహాలు వారి పేరు మరియు గ్రామముతో సహా వారికి అందించిన స్లిప్ ల మీద వ్రాసి ఇవ్వమని అతను కోరినారు. పబ్లిక్ హియరింగ్ యొక్క పూర్తి ప్రొసీడింగ్స్ వీడియోలో రికార్డ్ చేయబడుతుంది మరియు అధీకృత అధికారులు నిర్ణయం తీసుకొనుట కొరకు పంపించబడుతుందని ఆయన అన్నారు. పబ్లిక్ హియరింగ్ లో ప్రతిపాదించబడిన దాని మీద సమస్యలపై స్పష్టత ఇవ్వడం తప్ప తుది తీర్పు ఉండదు. నష్ట పరిహారం చెల్లించె విషయంలో ప్రస్తుత భూ సేకరణ చట్టం , 2013 యొక్క నియమాల ప్రకారం ఉంటుందని ఆయన అన్నారు. పబ్లిక్ హియరింగ్ కొరకు నియమించబడిన సమయం ఉదయం 11.00 గం ||ల నుండి మధ్యాహ్నం 01.00 గం||ల వరకు అని ఆయన అన్నారు. ఇంతకు ముందు ఒక వక్త లేవనెత్తిన అంశమును మరలా అదే అంశము కాకుండా, సమయాన్ని న్యాయ పరంగా సద్వినియోగం చేసుకోవలెనని ఆయన్నారు. తదుపరి ఆయన SE నీటి పారుదల & ఆయకట్టు అభివృద్ధి శాఖ వారిని ప్రతిపాదించబడిన ప్రాజెక్ట్ యొక్క విశేష లక్షణాలు మరియు పర్యావరణ కన్సల్టెంట్ ద్వారా ప్రదర్శించబడిన ముసాయిదా నివేదిక గురించి వివరించమని కోరినారు.

శ్రీ. A. సత్యనారాయణ రెడ్డి , SE, నీటి పారుదల & ఆయకట్టు అభివృద్ధి శాఖ , PRLIS, రంగారెడ్డి : నియామానుసారంగా అందరు ప్రజా ప్రతినిధులను మరియు జిల్లా కలెక్టర్,

ఇతర అధికారులు మరియు ఆ స్థలంలో చేరి వచ్చిన వారికి స్వాగతం పలుకుతూ ప్రాజెక్ట్ వివరాలు ఈ క్రింది విధంగా వివరించినారు:

ఎగువ ప్రాంతాలు మరియు నీటి కొరత కలిగి కరువుకు గురి ఐన ఐదు జిల్లాలు – మహబూబ్ నగర్ , నాగర్ కర్నూల్ , రంగా రెడ్డి , వికారాబాద్ , నల్గొండ జిల్లాలలో ఇవి దేశంలో ఎక్కువ కరువు పీడిత సెమీ-ఆరిడ్ ప్రదేశాల జాబితాలో చేర్చబడిన వాటికి మంచి నీటి సరఫరా చేయుటకు పాలమూరు రంగారెడ్డి ఎత్తిపోతల పథకం (PRLIS) ఉద్దేశించినది.

కాలానుగుణంగా సంభవించే కరువు వలన ఈ ప్రాంత ప్రజలు వారి జీవినోపాధి కొరకు ఇతర ప్రాంతాలకు వలస వెళ్తూ ఉంటారు.

ఈ జిల్లాలలో మొత్తం భూభాగోళిక ప్రాంతాలతో పోల్చినట్లయింట్ పైన తెల్పిన జిల్లాలలోని సాగు భూమి శాతం దాల తక్కువ.మరియు నీటి పారుదల ప్రాంతము మరీ తక్కువ.

ఈ సమస్యను అధిగమించుటకు , ప్రభుత్వము వారు కృష్ణ నది మీద ఉన్న శ్రీశైలం రిజర్వాయర్ నుండి 5 స్థాయిలలో మరియు 6 రిజర్వాయర్ ద్వా 12,30,000 ఎకరాల భూమికి 1226 గ్రామాలలో 70 మండలాలలో 6 జిల్లాలకు నీటి పారుదల అందించుట కొరకు, ప్రజలకు త్రాగు నీటితో పాటు మరియు పరిశ్రమల అవసరతలకు వరద సీజన్ లో 60 రోజుల వరకు 90 ft. TMC ల నీరు అందిందాలని ప్రతిపాదించింది.

ఈ ప్రాజెక్ట్ 90 ft. TMC (నీటి పారుదల కొరకు 82.52 TMC ల నీరు, 7.15 TMC త్రాగు నీటి సరఫరా కొరకు మరియు 0.33 పరిశ్రమల వాడుక కొరకు నీటి నిల్వ / సామర్థ్యం కలిగి ఉన్నది. ఈ ప్రాజెక్ట్ యొక్క బడ్జెట్ రూ . 52,056.31 cr. మరియు BC నిష్పత్తి 1.25:1.

1వ ఫేస్ త్రాగు నీరు మరియు పరిశ్రమల అవసరత, నీటి పారుదల కాలువలు , చాన్నెల్ లు, టన్నెల్ లు వాటితో 5 రిజర్వాయర్ లు అనగా (1) అంజనగిరి (2) వీరాంజనేయ (3)

వెంకటాద్రి (4) కురుమూర్తిరాయ (5) ఉదండాపూర్ (6) K.P.లక్ష్మీదేవిపల్లి అనేవి మొదటి ఫేస్ లో ఉన్నాయి.

కురుమూర్తిరాయ, ఉదండాపూర్ మరియు K.P.లక్ష్మీదేవిపల్లి రిజర్వాయర్ లు ఈ ప్రాజెక్ట్ ద్వారా 915.47 kms పొడవు కలిగి ఉండి , రంగా రెడ్డి జిల్లా లోని 20 మండలాలు , 33 గ్రామాలకు నీటి సరఫరా అందిస్తుంది. పైన పేర్కొన్న రిజర్వాయర్ ఈ జిల్లాలో 3,59,000 ఎకరాలకు నీటి సరఫరా చేస్తుంది.

ఈ జిలాలో కేవలం కాలువలు త్రవ్వబడతాయి మరియు ఈ జిల్లాలో నీటి నిల్వ రిజర్వాయర్ స్థాపించబడుతుంది. పూర్తీ భూ సేకరణ కేవలం 3533 ఎకరాల భూమి మాత్రమె. ఈ విధంగా ఈ జిల్లా లాభపడుతుంది.

ఈ ప్రాజెక్ట్ పూర్తీ కావడం వలన భూగర్భ జలాల పట్టిక అభివృద్ధికి సహాయ పడుతుంది , సాగు భూమి ప్రాంతము వ్యాప్తి చెందుతుంది , ప్రజల సామాజిక – ఆర్థిక స్థితిగతులు అభివృద్ధి చెందుతాయి. చేపల పెంపకము , పశు సంవర్ధకము తద్వారా అధిక పాల ఉత్పత్తులు ఇన్ఫ్రా స్ట్రక్చర్ వసతులు అనగా రోడ్ల నెట్ వర్క్ లాంటి అభివృద్ధి వలన స్థానిక ప్రజలకు ఉద్యోగ అవకాశాలు ఉంటాయి. ఇతర ముఖ్యమైన రంగము వినోదము మరియు పర్యాటక రంగములు అభివృద్ధి చెందుతాయి తద్వారా ఉద్యోగ అవకాశాలు ఉత్పన్న మౌతాయి.

శ్రీ G.లక్ష్మిపతి నాయుడు , AGM, IP&D, M/s. వోయంట్స్ సొల్యుషన్స్ ప్రై.లి. హైదరాబాద్ చైర్మన్ గారిని మరియు అధికారులను , NGOలను మరియు హియరింగ్ కొరకు సభాస్థలిలో హాజరైన ప్రజలను సాదరంగా ఆహ్వానించిన తర్వాత , ఈ క్రింది పర్యావరణ వివరాలు నియమాలు , ఊహించిన ప్రభావాలు మరియు ఉపశమన చర్యల ను వివరించారు.

ప్రాజెక్ట్ ప్రాంతము లోని 6 స్థానాలలో 2020 వర్షాకాలం ముందు, 2019 వర్షాకాలం తర్వాత 2019 వర్షాకాలం తర్వాత బేస్ లైన్ అధ్యయనాలు నిర్వహించబడినాయి.

EIA మరియు EMP, MoEF&CC నెం.J-12011/31//2017-IA (R), తేది : 11.10.2017న జారీ చేసిన ToR ప్రకారము తయారు చేయబడినది, మరియు అది అక్టోబర్ 10, 2021 వరకు చెల్లుబాటులో ఉన్నది.

పబ్లిక్ హియరింగ్ నోటిఫికేషన్స్ తేది 10-07-2021న జారి చేయబడినవి, ఆ ప్రకారము ఈ పబ్లిక్ హియరింగ్ ఇక్కడ నిర్వహించబడినది.

ప్రాజెక్ట్ రెండు దశలుగా విభజించబడినది. 1వ దశ త్రాగు నీరు కలిగినది మరియు 2వ దశ నీటిపారుదల నీరు మరియు నీరు వరదలు వచ్చినప్పుడు శ్రీశైలం ప్రాజెక్ట్ తీరప్రాంతాల నుండి నీటిని తీసుకుంటారు.

త్రాగునీరు ఐదు జిల్లాలు అయిన మహబూబ్ నగర్, నాగర్ కర్నూల్, నల్గొండ, నారాయణ్ పెట్, వికారాబాద్, రంగారెడ్డి జిల్లా మరియు హైదరాబాద్ నగరానికి సరిపోతుంది.

నీటిపారుదల 6 జిల్లాలు (మహబూబ్ నగర్, నాగర్ కర్నూల్, నల్గొండా, నారాయణ్ పేట్, వికారాబాద్, రంగారెడ్డి) లోని 70 మండలాలు, 1226 గ్రామాలకు సరిపోతుంది; కమాండ్ ఏరియా :4,97,976 హెక్టార్లు, పొడవు : 915.47 km.

అంజనగిరి, వీరాన్జనేయ, వెంకటాద్రి, కురుమర్తిరాయ, ఉదండాపూర్ మరియు లక్ష్మీదేవిపల్లి లోని 6 సమతుల్యమైన రిజర్వాయర్ ల ద్వారా దశల వారిగా నీటి సరఫరా జరుగుతుంది; 5 దశలలో ఎత్తి పోతలు మరియు తదానుసారంగా ప్రవాహం తీవ్రత ద్వారా నీటి వినియోగం అవుతుంది.

సదరు ప్రాజెక్ట్ నీటి నిల్వ/సామర్థ్యము 90 TMC (82.52 TMC) నీటి పారుదల కొరకు , 7.15 TMC త్రాగునీటి సరఫరా మరియు 0.33 పారిశ్రామిక వాడుక కొరకు. ఈ ప్రాజెక్ట్ యొక్క బడ్జెట్ రూ 52,056.31 cr. మరియు BC నిష్పత్తి 1.25:1.

రిజర్వాయర్ మరియు కెనాల్ పరంగా ఆయకట్ వివరాలు DPRలో వివరించిన ప్రకారము.

పర్యవేక్షణ చేయబడిన కొలతలు ఉపరితల గాలి నాణ్యత ; ఉపరితల శబ్దం నాణ్యత ; నేల నాణ్యత; భూగర్భ జల నాణ్యత మరియు ఉపరితల నీటి నాణ్యత.

మైక్రో-క్లైమేట్ : సూక్ష్మ వాతావరణం: నిర్మాణ దశలో నిర్మాణ పనుల కారణంగా ఉష్ణోగ్రత మరియు తేమపై స్వల్పకాలిక ప్రభావం మరియు ఆపరేషన్ దశలో ఎటువంటి ప్రభావం ఉండదు. నియంత్రిత నిర్మాణ ప్రక్రియ అవసరం.

భూమి-ఉపయోగము:వ్యవసాయ/వ్యవసాయేతర భూమి శాశ్వతంగా తరి భూమిగా మార్పు చేయబడుతుంది. ప్రణాళిక పరంగా అభివృద్ధి చేయబడిన భూమి-ఉపయోగము ప్రభావాన్ని తగ్గిస్తుంది.

నేల నాణ్యత: నేల కోతపై మధ్యస్థ ప్రభావం , బ్లాస్టింగ్, నిర్మాణ సమయంలో పని తవ్వకం మరియు కార్యాచరణ దశలో పెద్ద ప్రభావం ఉండదు. కాలువ అమరిక వెంట అస్థిరమైన కార్యకలాపాల స్వీకరణ. ఉపశమన కొలతలో భాగంగా పై మట్టిని నిలుపుకోవడం మరియు టండింగ్ మరియు గ్రీన్ బెల్ట్ అభివృద్ధి కోసం ఉపయోగిస్తారు.

వాయు వాతావరణం: నిర్మాణ దశలో మధ్యస్థం నుండి అధిక దశలో ధూళి కాలుష్యానికి అవకాశం ఉంది మరియు ఆపరేషన్ దశలో పెద్దగా ప్రభావం ఉండదు. రోడ్ల క్రమ నిర్వహణతో నియంత్రిత కార్యకలాపాలను చేపట్టాలని సూచించారు. క్రమ పద్ధతిన కాలుష్య పర్యవేక్షణ అవసరం.

శబ్దం ప్రభావాలు: కన్స్ట్రక్షన్ కాలంలో మధ్యస్థం నుండి అధిక శబ్ద కాలుష్యం వచ్చే అవకాశం. అయితే కార్యాచరణ దశలో పెద్దగా ఊహించబడలేదు. ధ్వని శబ్దం అవరోధంగా పనిచేయడానికి బహుళ వరుస తోటలను పెంచడానికి సూచించబడింది.

బ్లాస్టింగ్ కారణంగా ప్రభావాలు: బ్లాస్టింగ్ కారణంగా గాలి పీడనం పెరుగుతుంది మరియు ఊహించిన శబ్దం వరుసగా 103.2-109.8 dB (A) పరిధిలో మరియు నిర్దేశిత 120 dB (A) పరిధిలో ఉంటుంది. జియోలాజికల్ ప్లానింగ్ మరియు బ్లాస్టింగ్ ప్రకారం నియంత్రిత మరియు ప్రణాళికాబద్ధమైన బ్లాస్టింగ్ సెటిల్మెంట్లు మరియు ఆవాసాలకు 300 మీటర్ల పరిధిలో చేపట్టబడదు. ఏదైనా ప్రతికూల ప్రభావాన్ని తగ్గించడానికి టన్నలింగ్ మరియు ఇతర ప్రధాన పనులను చేపట్టడానికి ఆమోదించబడిన బ్లాస్టింగ్ ప్రణాళికను అనుసరించాలని సూచించబడింది.

నీటి వాతావరణం: నది నీటిలో ఘన మరియు చీలిక ఏకాగ్రత పెరిగే అవకాశం. భూభాగం మరియు దాని భౌగోళిక పరిస్థితుల కారణంగా కొన్ని పాకెట్లలో నీరు నింపే అవకాశం ఉంది. ఉపశమన చర్యగా కాలువ వ్యవస్థలో నియంత్రిత త్రవ్వకాన్ని చేపట్టాలని మరియు వర్షాకాలంలో నీటి నిల్వను నివారించడానికి నిర్బంధిత తవ్వకాలను చేపట్టాలని సూచించారు.

భూగర్భ శాస్త్రం: స్థానికీకరించిన మరియు తక్కువ ప్రభావాలు మాత్రమే ఊహించబడతాయి. ప్రాంతం యొక్క భౌగోళిక స్థితికి అనుగుణంగా నియంత్రిత మరియు ప్రణాళికాబద్ధమైన బ్లాస్టింగ్ చేపట్టాలని సూచించబడింది.

హైడ్రాలజీ: నికర గ్రౌండ్ వాటర్ రీఛార్జ్ 970.24 MCM. కొన్ని పాకెట్స్‌లోని అనియంత్రిత సీపేజీని నివారించడానికి క్రమం తప్పకుండా పర్యవేక్షణ చేయాలని సూచించారు, ఫలితంగా ప్రమాదవశాత్తు కాలువల్లోకి విడుదల అవుతుంది.

వృక్షజాలం: ఈ ప్రాజెక్ట్ పరిసరాల్లో అంతరించిపోతున్న చెట్ల జాతులు లేవు. కాలువ గట్లు మరియు మొత్తం కాలువ నెట్‌వర్క్ ప్రాంతం వెంబడి అవెన్యూ మరియు బహుళ వరుసల తోటలను పెంచడానికి సూచించబడింది. నిర్మాణ దశలో అటవీ ప్రాంతాల్లో శిబిరాల ఏర్పాటులో భాగంగా పరిహార అడవుల పెంపకం చేపట్టబడుతుంది.

జంతుజాలం: ప్రాజెక్ట్ యొక్క నిర్మాణానికి అంతరించిపోతున్న మరియు ప్రమాదంలో ఉన్న జంతు జాతుల యొక్క ప్రస్తుత ఆవాసాలలో ఎటువంటి మార్పు లేనందున , అటవీ ప్రాంతాల చుట్టూ సహజమైన అటవీ ప్రాంతాలకు భంగం కలిగించకుండా ఉండటానికి అటవీ ప్రాంతాల సమీపంలో నియంత్రణ నిర్మాణాన్ని చేపట్టాలని సూచించబడింది.

సామాజిక-ఆర్థిక పరిస్థితి: క్రమం తప్పకుండా నీటి సరఫరా కారణంగా పంట భూమి పెరిగి ఆదాయ స్థాయిలలో మెరుగుదల ఉంటుంది. ప్రాజెక్ట్ ప్రాంతం సామాజిక-ఆర్థిక స్థితిని మెరుగుపరుస్తుంది మరియు ప్రజలు స్థిరమైన మరియు క్రమమైన ఆదాయాన్ని పొందుతారు.

పర్యావరణ నిర్వహణ ప్రణాళిక: పర్యావరణం మరియు జీవావరణ శాస్త్రం నిర్వహణ కోసం రూ.1744 కోట్లు ఖర్చు చేయాలని ప్రతిపాదించారు. కమాండ్ ఏరియా డెవలప్‌మెంట్ , రీసెట్‌మెంట్ మరియు రీహాబిలిటేషన్ ప్లాన్ , గ్రీన్ బెల్ట్ డెవలప్‌మెంట్ ప్లాన్ ఘన వ్యర్థాల తొలగింపు కొరకు అంచనా వేసిన పర్యావరణ పర్యవేక్షణ ఖర్చు రూ.228 లక్షలు.

భూ సేకరణ: భూమికి పరిహారం RECT LAAR చట్టం, 2013 ప్రకారం చెల్లించబడుతుంది. మార్కెట్ విలువను బట్టి పరిహారం చెల్లించబడుతుంది మరియు గ్రామీణ ప్రాంతాల్లో గుణకారం కారకం గరిష్టంగా 2 మరియు పట్టణ ప్రాంతాల్లో 1 గా ఉంటుంది.

సొలాటియం: మార్కెట్ విలువ ఆధారంగా మరియు భూమి విలువకు అనుబంధంగా ఉన్న ఆస్తుల విలువ మరియు మార్కెట్ విలువపై గుణకార కారకం ఆధారంగా సొలాటియం చెల్లించబడుతుంది.

R&R కింద అంచనా వ్యయం రూ.1566.86 కోట్లు.
జిల్లా కలెక్టర్ , రంగారెడ్డి జిల్లా , నీటిపారుదల శాఖ అధికారులు ప్రాజెక్ట్ యొక్క ముఖ్య లక్షణాలను వివరించారు మరియు EIA కన్సల్టెంట్ పర్యావరణ వివరాలు మరియు ఉపశమన చర్యలను కూడా తెలియజేసారు. ప్రజల నుండి స్వీకరించబడిన స్లిప్‌ల ప్రకారం ప్రజల అభిప్రాయాలను , సలహాలను మరియు సూచనలను ఒక్కొక్కటిగా అందించాలని ఆయన అభ్యర్థించారు.

1.శ్రీ. టి. ఖగేందర్, సిఇ (రిటైర్డ్): ప్రాజెక్ట్ ప్రతిపాదకులు సాంకేతిక వివరాలను వివరించారు. రికార్డు ప్రకారం , అవిభక్త జిల్లాలైన మహబూబ్ నగర్ , నల్గొండ మరియు రంగారెడ్డి తెలంగాణ రాష్ట్రంలో కరువు ప్రాంతాలు. నిర్మాణానికి ముందు మరియు తరువాత జూరాలా ప్రాజెక్ట్ యొక్క కమాండ్ ప్రాంతం యొక్క శ్రేయస్సుతో పోలికను రూపొందించాడు , ఇది ప్రజలకు ప్రయోజనం చేకూర్చింది. ఈ ప్రాజెక్ట్ వ్యవసాయానికి మాత్రమే కాకుండా , మత్స్య పాడి పరిశ్రమ వంటి ఇతర అనుబంధ రంగాలకు కూడా సహాయపడుతుంది. అందువల్ల ప్రజలు ఈ ప్రతిపాదనకు తమ మద్దతును అందించాలని ఆయన అభ్యర్థించారు.

2. శ్రీ.ఎన్. పత్య నాయక్, మాజీ MPTC, ఆమంగల్ మండలం మిత్యగుంట తండా నివాసం: ముఖ్యంగా కల్వకుర్తి తాలూకా మరియు సాధారణంగా మహబూబ్ నగర్ కరువు ప్రాంతాలు అని ఆయన పేర్కొన్నారు. నవంబర్-డిసెంబర్ నాటికి , ట్యాంకులు ఎండిపోవడం వలన ఇక్కడి ప్రజలు హైదరాబాద్ లేదా ముంబై వంటి ప్రదేశాలకు వలస వెళ్తున్నారు. ఈ ప్రాంతంలో అనేక తాండాలు ఉన్నాయి మరియు సాధారణంగా ప్రజలు బీద వారు మరియు పొడి భూమి వ్యవసాయంపై ఆధారపడి న వారు . ఇటువంటి అన్ని గ్రామాలకు మిషన్ భగీరథ కింద తాగునీరు అందించినందుకు ప్రభుత్వానికి ఆయన కృతజ్ఞతలు తెలిపారు. ఈ కాలువ నిర్మాణం తర్వాత భూగర్భ జలాల స్థితి మరింత మెరుగుపడాలని ఆయన ఆకాంక్షించారు. 10 ఎకరాల భూమికి యజమానిగా ఉన్న తన బంధువు 15 బోర్‌వెల్‌లను తవ్వినా ఫలితం లేకపోయింది. అతను తన భూమిని అమ్మి, ప్రస్తుతం హైదరాబాద్‌లో ఆటో డ్రైవర్‌గా పనిచేస్తున్నాడు. ఆమంగల్ మండలం సూరసముద్రం మరియు సెట్టిపల్లిలో రెండు

ముఖ్యమైన ట్యాంకులు నింపాలని ఆయన అభ్యర్థించారు మరియు మునుపటిది ఆమంగల్ కు తాగునీటిని సరఫరా చేసింది. ప్రతిపాదిత ప్రాజెక్టుకు అతను తన మద్దతు వ్యక్తపరిచాడు.

3. శ్రీ. టి. దశరథ్ నాయక్, ZPTC, కడ్తాల్: సంప్రదాయ స్వాగత ప్రసంగం తరువాత, అతను ఈ రోజును ఈ ప్రాంతానికి అనువైన రోజుగా భావించాడు. అతను నాగర్ కర్నూల్ , కొల్లాపూర్ మరియు కల్వకుర్తి ప్రాంతాల ఉదాహరణను ఉదహరించారు , ఇది కాలువ నీటి సరఫరా తర్వాత సంపన్నంగా మారింది మరియు ఇక్కడ కూడా పరిస్థితి మెరుగుపడుతుందని ఆశించారు. తన బంధువు యొక్క ఉదాహరణను వివరించారు. అతను ఎల్లికల్ తండాలో తన 3 ఎకరాల భూమిని వదిలి 7 సంవత్సరాల క్రితం ఉపాధి కోసం ముంబైకి వలస వచ్చాడు. ఈ ప్రాంతం కల్వకుర్తి ఎత్తి పోతల నీటి పారుదల ప్రాజెక్ట్ పరిధిలో ఉన్నందున, అతను తన భూమిలో వరి పండించగలడు మరియు ఇతరులకు ఋణాలు ఇవ్వడానికి తగినంత డబ్బు సంపాదించగలిగాడు. ప్రతిపాదిత ప్రాజెక్ట్ ఈ మండలంలోని 70,000 ఎకరాల భూమికి ప్రయోజనం చేకూర్చినందున , 222 తాండాలతో ఉన్న ఈ ప్రాంత ప్రజలు ప్రయోజనం పొందుతారు , ఇది వారు ముందు ఎదుర్కొన్న తాగునీటి కొరత సమస్యను కూడా తొలగిస్తుంది మరియు ఈ ప్రాంతం ఇతర ప్రాంతాల వలె సంపన్నంగా ఉంటుంది.

4. శ్రీ. చందూ జీ, కడ్తాల్ నివాసి: సంప్రదాయ స్వాగత ప్రసంగం తర్వాత అతను ఈ ప్రాంతం నుండి అనేక కుటుంబాలు వలస వచ్చినట్లు పేర్కొన్నాడు. వర్షాధార ప్రాంతం కావడంతో కరువు తరచుగా ఉంటుంది మరియు ప్రజలు ఇబ్బందులు ఎదుర్కొంటున్నారు. ఈ ప్రాజెక్టును మంజూరు చేసినందుకు ఆయన ప్రభుత్వానికి కృతజ్ఞతలు తెలిపారు. ఈ ప్రాజెక్ట్ వల్ల పరిశ్రమలు, వ్యవసాయ మరియు పశువుల సంపదపై ఎటువంటి హానికరమైన లేదా ప్రతికూల ప్రభావం ఉండదు. ఈ ప్రాంతం యొక్క పర్యావరణం మరియు జీవావరణ శాస్త్రం సహా ఉపరితలం లేదా భూగర్భ జలాలపై ఎటువంటి ప్రతికూల ప్రభావం ఉండదని మరియు సంబంధిత అధికారుల ద్వారా అవసరమైన ఉపశమన చర్యలు తీసుకోవాలని ఆయన

ఆకాంక్షించారు. నేలలు కోతకు గురికావడం మరియు కాలువ ఒడ్డు తోటలను పెంచడానికి గ్రౌటింగ్ మరియు కాలువ లైనింగ్‌ను ఆయన సూచించారు. ఈ ప్రాంతం యొక్క పర్యావరణం మరియు పర్యావరణాన్ని పరిరక్షించడం ద్వారా పర్యాటకం మరియు మత్స్య సంపద అభివృద్ధి చెందాలని ఆయన అభిప్రాయపడ్డారు. రెండు పంటలకు నీరు అందించడం వల్ల ప్రజల సామాజిక-ఆర్థిక పరిస్థితి మెరుగుపడుతుంది. ఈ ప్రాజెక్ట్ పర్యావరణ పరిరక్షణ మరియు జీవవైవిధ్య పరిరక్షణను మెరుగుపరుస్తుందని ఆయన ఆశించారు.

5. శ్రీ మధుసూధన్ రెడ్డి , కడ్తాల్ నివాసి: ప్రతిపాదిత ప్రాజెక్ట్ వల్ల పర్యావరణం మెరుగుపడుతుందని మరియు పెరిగిన వృక్షసంపద వృద్ధి వల్ల అవపాతం పెరుగుతుందని ఆయన చెప్పారు. తలకొండపల్లి ఉన్నందున నీరు అందకపోవడంపై అపార్థం ఉందని ఆయన పేర్కొన్నారు. తలకొండపల్లి మండల పరిధిలోని 21 గ్రామాలు ఈ ప్రాజెక్ట్ పరిధిలోకి రావడం గమనార్హం. కాళేశ్వరం ప్రాజెక్ట్ మాదిరిగా 2 సంవత్సరాలలోపు ఈ ప్రాజెక్ట్ త్వరితగతిన పూర్తి కావాలని ఆయన ఆకాంక్షించారు , కాళేశ్వరం ప్రాజెక్ట్ పూర్తి కావడానికి 3.5 సంవత్సరాలు పట్టింది.

6. శ్రీ. ఎస్. ముత్యం రెడ్డి (SEE రిటైర్డ్ R & B, తెలంగాణ రిటైర్డ్ ఇంజనీర్స్ అసోసియేషన్): అవిభక్త మహబూబ్ నగర్ లో సగటున 600 మిల్లీమీటర్ల వర్షపాతం ఉన్న వెనుకబడిన జిల్లాగా పరిగణించబడుతుందని ఆయన పేర్కొన్నారు. హైదరాబాద్ నగరం మినహా మిగిలిన అన్ని జిల్లాలు ఆ సమయంలో అభివృద్ధిలో ఉన్నాయి. భౌగోళిక పరిస్థితుల కారణంగా తెలంగాణలో గురుత్వాకర్షణ ద్వారా నీటిపారుదల కింద ఉన్న ప్రాంతం చాలా తక్కువగా ఉంది మరియు ఈ ప్రాంతం యొక్క సమగ్ర అభివృద్ధిని నిర్ధారించడానికి నీటిని ఎత్తివేయడం మాత్రమే పరిష్కారం. ప్రతిపాదిత ప్రాజెక్ట్ వల్ల ఎలాంటి ప్రతికూల ప్రభావం ఉండదని, ఈ ప్రాజెక్ట్ కోసం ప్రజలు అభ్యంతరం చెప్పరని ఆయన అభిప్రాయపడ్డారు.

7. శ్రీ. జి. లక్ష్మీనరసింహ రెడ్డి, సర్పంచ్, కడ్తాల్: శ్రీశైలం జలాశయం ఎత్తు 270 మీటర్లు, లక్ష్మీదేవిపల్లి రిజర్వాయర్ స్థాయి 670 మీటర్లు అని ఆయన పేర్కొన్నారు. ప్రజల

వలసలను అదుపు చేయడానికి శ్రీశైలం తీర ప్రాంతం నుండి నీటిని పంపింగ్ చేయడానికి సంబంధిత ప్రభుత్వ ఉత్తర్వులు 08.08.2013న జారీ చేయబడ్డాయి. 23 గ్రామాల్లోని గ్రామస్తులకు సమీపంగా వాటర్ రిజర్వాయర్ నిర్మానించడం విషయంలో ఇంజనీర్లను ఆయన అభినందించారు. అదేవిధంగా , మత్స్యకారులు కూడా ప్రయోజనం పొందుతారు , పర్యావరణ పరిస్థితులను మెరుగుపరి స్తే ఈ ప్రాంతాలన్నింటిలో పచ్చదనం అభివృద్ధి చేయబడుతుంది.

8. శ్రీ. జె.అనంత్ రెడ్డి , వైస్ ఎంపీపీ: ఈ ప్రాంత ప్రజలు కష్టపడి పనిచేసేవారని ఆయన పేర్కొన్నారు. ప్రజల ప్రయోజనాల కోసం ప్రభుత్వం ఈ ప్రాజెక్టు అమలును వేగవంతం చేస్తుందని ఆయన ఆశించారు.

9. శ్రీ. అప్పం శ్రీను , ఆమంగల్: పాలమూరు గతంలో సంపన్న ప్రాంతంగా పరిగణించబడిందని, ఆ తర్వాత కరువు పీడిత ప్రాంతంగా మారిందని ఆయన వివరించారు. 60% ప్రాంతానికి ప్రయోజనం చేకూర్చేలా ఈ ప్రాజెక్టును మంజూరు చేసినందుకు పర్యావరణానికి ఎలాంటి ప్రతికూల ప్రభావం ఉండదని మరియు ఎలాంటి సమస్య తలెత్తదని ఆయన ప్రభుత్వానికి కృతజ్ఞతలు తెలిపారు. వాస్తవానికి భూగర్భజలాలు మెరుగుపడతాయి మరియు ప్రాజెక్ట్ అమలును వేగవంతం చేయాలని ప్రభుత్వాన్ని కోరారు.

10. శ్రీ. డి.సత్యనారాయణ , వైస్-చైర్మన్ పిఎసిఎస్ , పోలేపల్లి (గ్రామం) , ఆమంగల్ (మండలం): సంప్రదాయ ప్రసంగం తర్వాత ఈ ప్రాంతం రుతుపవనాలపై ఆధారపడి జీవిస్తుందని పేర్కొన్నారు. కాలువ తవ్వకం తరువాత , ఈ ప్రాంతం పచ్చగా ఉంటుందని ఆయన ఆశించారు. కాళేశ్వరం మరియు PRLIS ఒకేసారి అతను ప్రారంభించా రు, కానీ మునుపటిది ప్రారంభించబడింది మరియు ఈ ప్రాజెక్ట్ కూడా యుద్ధ ప్రాతిపదికన పూర్తవుతుందని ఆశించారు.

11. శ్రీ. ఆర్. తిరుపతి , ఉప సర్పంచ్ , దేవునిపడ్కల్ (గ్రామం): సంప్రదాయ ప్రసంగం తర్వాత, రుతుపవనాల వైఫల్యం మరియు బోర్‌వెల్స్ ఎండిపోవడం వల్ల ఈ ప్రాంత రైతులు నష్టపోయారని ఆయన పేర్కొన్నారు. ఈ ప్రాజెక్ట్ ప్రారంభించిన తర్వాత నీటిపారుదల మరియు త్రాగునీటి కోసం బోర్ వెల్‌లపై ఆధారపడటం తగ్గుతుందని ఆయన ఆశించారు.

12. శ్రీ. కె.రామకృష్ణ, ఉప సర్పంచ్, కడ్తాల్ (గ్రామం & మండలం): తన ప్రారంభ ప్రసంగం తర్వాత, ప్రతిపాదిత నీటిపారుదల ప్రాజెక్ట్ కారణంగా 20 మండలాల పరిధిలోని ప్రాంతం అభివృద్ధి చెందుతుందని అతను ఆశించాడు. ఈ ప్రాజెక్ట్ కింద 3200 ఎకరాల భూమిని కవర్ చేస్తామని ఆయన పేర్కొన్నారు. అతను ప్రతిపాదిత ప్రాజెక్ట్‌కు మద్దతు ఇచ్చాడు , ఎందుకంటే ఇది ఈ ప్రాంతం యొక్క అన్ని విధాల అభివృద్ధిని నిర్ధారిస్తుంది.

13. శ్రీ. బి. కుమార్ , ఆమంగల్ మండలం పోలేపల్లి నివాసి: తమ గ్రామ పంచాయితీకి ప్రయోజనం లేదని ఫిర్యాదు చేశారు మరియు వూరసముద్రం మరియు సెట్టిపల్లి ట్యాంకులలో నీటిని నింపడానికి కాలువను ఎత్తైన ప్రదేశంలో తిరిగి అమర్చాలని విజ్ఞప్తి చేశారు. ఈ దశ మాడ్గుల మండలానికి కూడా ప్రయోజనం చేకూరుస్తుందని తెలిపారు.

14. శ్రీ పరమేష్, జిల్లా రైతు సభ్యుడు, కడ్తాల్ (మండలం): 90 టీఎంసీల అడుగుల ఎత్తివేత వల్ల 12 లక్షల ఎకరాలకు పైగా భూములకు సాగునీరు అందుతుందని , కాకపోతే, ఈ మేరకు నీరందించడానికి బోరుబావుల సంఖ్యను పెంచవలసి ఉంటుందని ఆయన పేర్కొన్నారు. ఈ ప్రాజెక్ట్ పూర్తయిన తర్వాత లక్షలాది మందికి ప్రయోజనం చేకూరుతుందని, ఈ ప్రాజెక్టుకు తమ మద్దతును అందించాలని ఆయన ప్రజలకు విజ్ఞప్తి చేశారు.

15. శ్రీ. లచిరామ్ నాయక్: వా సుదేవపూర్, MPTC, కర్కల్‌పహాడ్ నివాసి సంప్రదాయ ప్రసంగం తర్వాత , ప్రజలు తమ గ్రామాల్లో పనులు వర్షాకాలంలో చేసుకుంటారని పేర్కొన్నారు. పొడి కాలంలో , ప్రజలు వలస వెళ్లి పట్టణ ప్రాంతాల్లో నిర్మాణ కార్మికులుగా

పని చేస్తారు. ఈ ప్రాజెక్ట్ పూర్తయిన తర్వాత వారి గ్రామాల్లో ఏడాది పొడవునా ఉపాధి ఉంటుందని ఆయన ఆశించారు.

16. జె. వీరయ్య , రైతు అధ్యక్షుడు , కడ్తాల్ నివాసి: అతను కాళేశ్వరం ప్రాజెక్ట్ యొక్క పోలికను తీసారు, అక్కడ ట్యాంకులు సంవత్సరానికి 2 పంటలను పెంచడానికి నింపబడతాయి, ఇది మన సామాజిక-ఆర్థిక పరిస్థితులను మెరుగుపరచడానికి వీలు కల్పిస్తుంది. కడ్తాల్ మరియు ఆమనగల్ మండలాలలో గత సంవత్సరం వర్షపాతం కారణంగా 2 పంటలు పండించగల ఉదాహరణను ఆయన ఉదహరించారు. అతను ప్రాజెక్టుకు తన మద్దతును అందించాడు.

17. శ్రీ. శ్రీనివాస్ యాదవ్ , తలకొండపల్లి నివాసి: ప్రాజెక్ట్ ప్రతిపాదనను స్వాగతిస్తూ , ఈ మండలంలోని 21 గ్రామాలు ఈ ప్రాజెక్ట్ పరిధిలోకి వస్తాయని ఆయన పేర్కొన్నారు. 3.5 సంవత్సరాలలో పూర్తయిన కాళేశ్వరం ప్రాజెక్ట్ మాదిరిగానే ఈ ప్రాజెక్ట్ 2 సంవత్సరాలలో పూర్తవుతుందని ఆయన ఆశించారు. 2000 ఎకరాల భూమికి ప్రయోజనం చేకూర్చేందుకు సహదేవ సముద్రం సరస్సును నింపాలని కో రారు మరియు మిషన్ కాకతీయ మరియు మిషన్ భగీరథ అవసరాలను తీర్చడానికి నీటి వినియోగదారుల సంఘం కోసం 52 కోట్లు అందించినందుకు ప్రభుత్వాన్ని అభినందించారు.

18. శ్రీ. జి. వెంకటేష్ , PACS చైర్మన్, కడ్తాల్ (మండలం): సంప్రదాయ ప్రసంగం తర్వాత అతను గత సంవత్సరం ప్రజలు తమ భూమిని సాగు చేశారని మరియు ఎకరాకు 30 బస్తాలు పండించారని పేర్కొన్నాడు. సాగునీటి ప్రాజెక్టుల కింద రైతులు ఎకరాకు 60 బస్తాలు పండించారు. ఈ ప్రాజెక్ట్ వల్ల ఎలాంటి ప్రతికూల పర్యావరణ ప్రభావాలు ఉండవని , మత్స్యకారులకు ప్రయోజనం చేకూరుతుందని ఆయన అభిప్రాయపడ్డారు. అతను నిరంతరం పర్యావరణ క్షీణతకు కారణమయ్యే మైనింగ్ ప్రాజెక్టులతో ఈ సాగునీటి ప్రాజెక్టును పోల్చి తన అభిప్రాయాలను ముగించాడు.

19. శ్రీ సుధాకర్ రెడ్డి , MPTC: సంప్రదాయ ప్రసంగం తర్వాత అతను ప్రతిపాదిత PRLIS కి ఎలాంటి అభ్యంతరం ఉండదని పేర్కొన్నాడు. ఈ ప్రాంతం సర్వతోముఖాభివృద్ధికి నీరు

ప్రధానమైన మరియు ప్రధానమైన ఇన్‌పుట్‌గా కొనసాగుతోందని మరియు ఈ ప్రాజెక్ట్ గ్రౌండింగ్ చేసినందుకు ప్రభుత్వాన్ని అభినందించారు.

20. శ్రీ. కె. శంకర్ , పడ్కల్ (గ్రామం) నివాసి: ఈ ప్రాంతానికి నీటి సరఫరాపై తన సంతోషాన్ని వ్యక్తం చేశారు మరియు 24 గంటలూ విద్యుత్ సరఫరా చేసినందుకు ప్రభుత్వాన్ని అభినందించారు మరియు ఆహార ధాన్యాలతో నిండిన గిడ్డంగులను ఉదాహరణ ప్రభుత్వం సాధించిన విజయం గా పేర్కొన్నారు. లైఫ్‌లైన్‌గా దాని ప్రాముఖ్యత దృష్ట్యా ప్రజలు ఈ ప్రాజెక్ట్‌కు ఖచ్చితంగా మద్దతు ఇస్తారని ఆయన ఆశించారు.

21. శ్రీ. శ్రీనివాస్ రెడ్డి , చిక్కాపూర్ నివాసి: సాగునీరు మరియు తాగునీటి పథకాలను అమలు చేయడానికి అతను ప్రభుత్వాన్ని అభినందించారు. ఇవి వ్యవసాయ భూముల ఉత్పాదకతను పెంచుతుంది. ఈ ప్రాజెక్టు అమలును వేగవంతం చేయాలని ఆయన ప్రభుత్వాన్ని అభ్యర్థించారు.

22. శ్రీ. జి.రమేష్ , MPTC, పడ్కల్ నివాసి: సంప్రదాయ ప్రసంగం తర్వాత , ఈ ప్రాజెక్ట్ ప్రజలకు ప్రయోజనం చేకూరుస్తుందని , అయితే కాలువల నిర్మాణానికి స్వాధీనం చేసుకోవడం వల్ల భూములు కోల్పోతున్న కొంతమంది రైతులకు నష్టం వాటిల్లుతుందని ఆయన పేర్కొన్నారు. భూమి కోల్పోయిన వారందరికీ ప్రభుత్వంలో ఉద్యోగం కల్పించాలని ఆయన డిమాండ్ చేశారు. భూములకు ప్రస్తుతం ఉన్న మార్కెట్ రేట్లను పరిశీలించిన తర్వాత పరిహారం చెల్లించాలని ఆయన ప్రభుత్వానికి విజ్ఞప్తి చేశారు. భూమి కోల్పోయేవారిలో ఎక్కువ మంది చిన్న మరియు సన్నకారు రైతులు అని మరియు వారి ఆస్తికి మెరుగుదల పరిహారం చెల్లించడం ద్వారా ప్రభుత్వం నుండి మద్దతు అవసరమని కూడా ఆయన అభిప్రాయపడ్డారు. అతను ఈ ప్రాజెక్ట్ ప్రతిపాదనకు మద్దతు ఇచ్చారు.

23. శ్రీ. జి. యాదగిరి , తలకొండపల్లి నివాసి (గ్రామం మరియు మండలం): ఈ ప్రాజెక్ట్ ఈ ప్రాంత ప్రజలకు ప్రయోజనం చేకూరుస్తుంది కాబట్టి అతను తన నిర్ద్వంద్వ మద్దతును అందించారు. అతను తన స్వంత అనుభవాన్ని తెచ్చా రు, అక్కడ అతను విఫలమైన

బోర్‌వెల్‌లను తవ్వి అప్పుల పాలయ్యారు . ఎలాంటి సంకోచం లేకుండా ప్రజలు తమ మద్దతును అందించాలని ఆయన సూచించారు. పాడ్కల్ గ్రామం ఎత్తైన ప్రదేశంలో ఉందని మరియు ఎక్కువ మంది ప్రజలకు ప్రయోజనం చేకూర్చేందుకు గ్రామంలోని రెండు ట్యాంకులు నింపాల్సి ఉందని ఆయన పేర్కొన్నారు.

24. శ్రీ. ఎల్. మోహన్ రెడ్డి , మధురాపురం నివాసి: పాదనగర్ MSL కంటే 420 మీటర్ల ఎత్తులో ఉందని, అయితే లక్ష్మీదేవిపల్లి రిజర్వాయర్ యొక్క ఎలివేటిన్ 625 మీటర్లు అని పేర్కొన్నాడు. నీటిపారుదల వసతులు లేక అనేక మంది రైతులు తమ భూములను అమ్ముకున్నారని ఆయన పేర్కొన్నారు. ఈ ప్రాజెక్ట్ వల్ల ఎలాంటి ప్రతికూల ప్రభావం ఉండదు. జూరాల ప్రాజెక్ట్ నుండి లక్ష్మీదేవిపల్లి రిజర్వాయరుకు నీటిని పంపింగ్ చేయడానికి ఒక పథకాన్ని రూపొందించినందుకు రిటైర్డ్ ఇంజనీర్లను ఆయన అభినందించారు. కొత్త పథకంలో తగ్గిన రిజర్వాయర్ సామర్థ్యాన్ని గతంలో ఊహించిన విధంగా పెంచాలని ఆయన ప్రభుత్వాన్ని అభ్యర్థించారు. పర్యావరణంపై ఎటువంటి చెడు ప్రభావం ఉండదు , వాస్తవానికి, ఇది మత్స్య , ఉద్యానవన మరియు పశుపోషణ వంటి ఇతర ఆధారిత కార్యకలాపాలకు ప్రయోజనం చేకూరుస్తుంది. లక్ష్మీదేవిపల్లి రిజర్వాయర్ పనులను వేగవంతం చేయాలని ఆయన ప్రభుత్వానికి విజ్ఞప్తి చేశారు.

25. శ్రీ. నారాయణ ఆకుతోటపల్లికి చెందిన: ఉపాధి/పని కోసం 75% మంది ఇతర ప్రాంతాలకు వలస వెళ్ళిన గ్రామ ప్రజల కష్టాలను ఆయన వివరించారు. ఈ ప్రాజెక్ట్ స్థానిక ప్రజలకు ఏడాది పొడవునా ఉపాధిలో సహాయపడుతుందని ఆయన ఆశించారు.

26. శ్రీ. వై.నరసింహ మక్త మాధారం నివాసి ఏడాది పొడవునా ఉపాధిని పొందలేని రైతులకు ఈ కాలువలు ఉపయోగకరంగా ఉంటాయని ఆయన పేర్కొన్నారు. సేకరణ ప్రక్రియలో భూములు కోల్పోయిన రైతులకు న్యాయం చేయాలని ఆయన ప్రభుత్వానికి విజ్ఞప్తి చేశారు. అతను రిజిస్టర్డ్ విలువతో సంబంధం లేకుండా ఎకరానికి రూ. 75 లక్షలు కోరాడు. తాజా భూ సేకరణ చట్టం , 2013 నిబంధనల ప్రకారం అదనపు పరిహారం చెల్లిస్తే ప్రజలు సంతోషంగా ఉంటారు.

27. శ్రీ. డి.గిరి యాదవ్, ఆమంగల్ (గ్రామం) నివాసి: అవిభక్త మహబూబ్ నగర్ జిల్లా కరువు పీడిత ప్రాంతమని , ఈ ప్రాజెక్ట్ ప్రజలకు వరంగా మారుతుందని ఆయన పేర్కొన్నారు. ఈ ప్రాజెక్ట్ నిర్మాణం వల్ల ఎలాంటి ప్రతికూల పర్యావరణ ప్రభావం లేదని ఆయన అభిప్రాయపడ్డారు.

28. శ్రీ. బి. జగన్ రెడ్డి , చీపునుంతల నివాసి: ఈ ప్రాజెక్టుకు పర్యావరణ అనుమతి పొందడానికి ప్రజల నుండి ఎలాంటి అభ్యంతరం ఉండదని ఆయన పేర్కొన్నారు. తక్కువ నీటి వ్యాప్తి కలిగిన అనేక ట్యాంకులు ఉన్నాయని ఆయన అభ్యర్థించారు మరియు తన గ్రామంలో 52 ఎకరాల ట్యాంకును ఉదహరించారు. అన్ని మైనర్ ఇరిగేషన్ ట్యాంకులను నింపాలని ఆయన ప్రభుత్వానికి విజ్ఞప్తి చేశారు.

29. శ్రీ. బాల కృష్ణయ్య, వెల్దల్ (గ్రామం) నివాసి: కాళేశ్వరం ప్రాజెక్ట్ కింద 1 ఎకరం భూమి ఉన్న రైతు 10 ఎకరాల భూమి ఉన్న ఇక్కడ రైతు పోటీ పడలేకపోతున్నారని ఆయన ఫిర్యాదు చేశారు. ప్రాజెక్టు పనులను వేగవంతం చేయాలని ఆయన ప్రభుత్వాన్ని కోరారు.

30. శ్రీ. కె. మల్లేష్, దేవునిపడ్కల్ (గ్రామం) నివాసి: నీరు ప్రాథమిక అవసరమని మరియు శాశ్వత మూలం నుండి ట్యాంకులను తరచుగా నింపాల్సిన అవసరం ఉందని పేర్కొన్నారు. పంటలకు నీరు అందుబాటులో లేకపోవడం మరియు బోర్‌వెల్‌లు కూడా విఫలం కావడంతో అనేక మంది రైతులు అప్పుల పాలయ్యారు. PRLIS పూర్తయ్యాక ఈ సమస్య ఉండదని ఆయన ఆశించారు.

31.శ్రీ. Ch. రమేష్, సర్పంచ్, పడ్కల్ (గ్రామం) పరిహారం చెల్లింపుపై తన ఆవేదనను వ్యక్తం చేశారు మరియు భూసేకరణ చట్టం , 2013 నిబంధనల ప్రకారం కోల్పోయిన భూములకు న్యాయం చేయాలని ప్రభుత్వానికి విజ్ఞప్తి చేశారు.

32. శ్రీ. మోహన్ లాల్, R/o. వెల్దల్ (గ్రామం): తనకు 44 ఎకరాల భూమి ఉందని మరియు 40 కి పైగా బోర్‌వెల్‌లను తవ్వినట్లు పేర్కొన్నాడు , ఒక పద్యం ద్వారా తన ఆవేదనను

వ్యక్తం చేశాడు. ఈ ప్రాజెక్ట్ వల్ల పర్యావరణానికి ఎలాంటి నష్టం ఉండదని ఆయన భావించారు.

33. శ్రీ. రహమాన్, వెల్జల్ (గ్రామం) నివాసి ఈ ప్రాజెక్ట్‌ను స్వాగతించేటప్పుడు, ఒక జానపద పాట ద్వారా తన భావాలను ఉదహరించారు. మీరు వ్యవసాయ రంగంలో అభివృద్ధి చెందుతారని విశ్వసించారు మరియు సహదేవ సముద్ర సరస్సును పూరించమని అభ్యర్థించారు.

34. శ్రీ. కె. భీష్మ దారి, దారికొండ (గ్రామం): కోల్పోయిన భూమికి తగిన పరిహారం కోరినారు మరియు తమ గ్రామానికి ప్రయోజనం చేకూర్చేలా గొరమ్మ చెరువును పూరించాలని నీటిపారుదల శాఖను అభ్యర్థించినారు. ఈ ప్రాజెక్ట్ ప్రతిపాదనకు తన పూర్తి మద్దతును తెలియజేసాడు.

35 శ్రీ. జె. కృష్ణ గౌడ్, దేవునిపడ్కల్ (గ్రామం) నివాసి: ఈ ప్రాజెక్టును త్వరగా అమలు చేయమని అభ్యర్థించారు, ఎందుకంటే ఆలస్యం పంటలతో పాటు ప్రాణాలను కూడా కోల్పోయేలా చేస్తుంది. ఎండాకాలంలో పశుగ్రాసం అందుబాటులో లేనందున ప్రజలు పశువులను కబేళాలకు తరలిస్తున్నారు. చాలా మంది రైతులు అప్పుల పాలై తమ పశువులను అమ్ముకుని తమను తాము పోషించుకుంటున్నారని ఆయన ఆరోపించారు.

36. శ్రీ. బి. కుమార్, చంద్రకొండ (గ్రామం), తలకొండపల్లి (మండలం) నివాసి: స్వాతంత్ర్యం వచ్చి 77 సంవత్సరాలు గడిచినా గాని తమ గ్రామంలో ఎలాంటి అభివృద్ధి లేదని భావించారు. భూములకు తగిన పరిహారం చెల్లించడానికి న్యాయం చేయాలని ఆయన కోరారు. కాళేశ్వరం ప్రాజెక్టు విషయంలో అనుసరించిన విధంగా పరిహారం లెక్కించడానికి ప్రాతిపదికగా మార్కెట్ రేటు చెల్లించాలని ఆయన డిమాండ్ చేశారు. భూ సేకరణ మరియు మార్కెట్ విలువ కంటే 3 రెట్లు చెల్లింపు ప్రక్రియను స్వీకరించడం వంటి సమస్యలను అధిగమించడానికి తన వంతు దోహదపడతానని ఆయన పేర్కొన్నారు.

సుపరెంటెన్డింగ్ ఇంజనీర్, I&ఆయకట్టు అభివృద్ధి విభాగం వారు ఈ ప్రాజెక్ట్ గురించి పబ్లిక్ వారి సలహాలు, సూచనలు, అభిప్రాయాలను ఇచ్చినందుకు కృతజ్ఞతలు తెలియజేసారు. పబ్లిక్ చెప్పిన విషయాలను పరిశీలించి తగిన విధంగా చర్యలు తీసుకుంటామని తెలియజేసారు.

పబ్లిక్ హియరింగ్ లో మాట్లాడిన వక్తలు చెప్పిన విషయాల సారాంశమును రూపొందించ మని జిల్లా కలెక్టర్ EE, TSPCB వారిని కోరినారు.

EE, TSPCB పబ్లిక్ హియరింగ్ లో మాట్లాడిన వక్తలు చెప్పిన విషయాలను సంక్షిప్త పరచినది ఏమనగా :

మొత్తం 36 మంది వక్తలు వారి వారి అభిప్రాయాలు, సూచనలు వ్యక్తపరిచారు మరియు 3 వ్రాత పూర్వక ప్రతి పాదనలు అందినాయి అన్నారు. ఇంకను ఆయన తెలియ జేసినది ఏమనగా అన్ని సూచనలు రికార్డ్ చేయబడినవి మరియు తగిన చర్య తీసుకొనుట కొరకు అంతరాయము లేని వీడియో మరియు ఆడియో MoEF&CC, న్యూ ఢిల్లీకి పంపబడుతుంది అన్నారు.

జిల్లా కలెక్టర్ రంగారెడ్డి జిల్లా గారు అన్ని సూచనలు రికార్డ్ చేయబడినవి మరియు అంతరాయము లేని వీడియో మరియు ఆడియో MoEF&CC, న్యూ ఢిల్లీ కి తగిన చర్య తీసుకొనుట కొరకు పంపబడుతుంది అని చెప్తూ పబ్లిక్ హియరింగ్ ను ముగించారు.

పబ్లిక్ హియరింగ్ ముగించ బడినది.

ఈ సందర్భంగా అందిన ప్రతిపాదనలు అనుబంధం గా జత చేయబడినావు.

శ్రీ. M.వెంకన్న
పర్యావరణ ఇంజనీర్
T.S. కాలుష్య నియంత్రణ మండలి
ప్రాంతీయ కార్యాలయము -I రంగారెడ్డి జిల్లా.

శ్రీ. అమోయ్ కుమార్, IAS,
కలెక్టర్ & డిస్ట్రిక్ట్ మేజిస్ట్రేట్
రంగారెడ్డి జిల్లా

క్రమ సంఖ్య	ప్రతిపాదనలు సమర్పించిన వారు	అందుకున్న తేది	ప్రతిపాదన అంశము
	సర్వశ్రీ		
1	శ్రీ. డి. మోహన్ రెడ్డి , నివాసము తలకొండపల్లి	10.08.2021	1.PRLIS ప్రాజెక్ట్ ను సంపూర్తి చెయ్యాలి. 2.భూమి కోల్పోయిన వారికి ఎకరానికి @ రూ.75 లక్షల చొప్పున పరిహారం చెల్లించాలి. 3.ఋణమాఫీ లక్ష వరకు చెయ్యాలి. 4. విద్యుత్ సదుపాయము 24 గంటలు అందించాలు మరియు ఇనుప కరెంటు స్థంబాలను సిమెంట్ స్థంబాలతో మార్చాలి.
2	శ్రీ M. సత్యనారాయణ PHC మానవ వనరుల మరియు వికలాంగుల సంక్షేమ సంఘం , సరూర్ నగర్ , రంగా రెడ్డి జిల్లా	10.08.2021	1. పర్లతో పెకలించబడిన చెట్లను మళ్ళి నాటాలి. 2. ప్రసరిస్తున్న ధూళి ఉద్గారాలను తగ్గించాలి. 3. కాలువ సరిహద్దులలో రెండు వైపులా పండ్ల చెట్లు నాటాలి 4.ప్రజలకు సేంద్రీయ వ్యవసాయం గురించి సేర్పించాలి. 5. ఉద్యోగ విషయములో వికలాంగులకు 5% రిజర్వేషన్ కల్పించాలి.

3	M.బచయ్య, వ్యవస్థాపకుడు & జనరల్ కార్యదర్శి , పర్యావరణ నియంత్రణ అవగాహన సొసైటీ , హైదరాబాద్	10.08.2021	1. కాలువ సరిహద్దులలో రెండు వైపులా పండ్ల చెట్లు నాటాలి 2. LADP నిధులు పరిసర గ్రామాలను అభివృద్ధి చేయుటకు వినియోగించాలి. 3, భూమి కోల్పుతున్న రైతులకు పరిహారం చెల్లించాలి. 4. ఆరోగ్య కేంద్ర శిబిరాలు నిర్వహించాలి MoEF & CC వారిని 90 అనుమతి ఇవ్వాలి.

Minutes of the Environmental Public Hearing held for the Construction of Palamuru Rangareddy Lift Irrigation Scheme and Canal Network (PRLIS) PHASE-II Proposed by Irrigation & CAD Department, Government of Telangana held at Venkateshwara Function Hall, Talakondapalli (V) & (M) Rangareddy District on 10.08.2021 at 11.00 AM.

The following Public Hearing panel members were present:

S. No.	Name of the Panel Member	Designation
1.	Sri Amoy Kumar, IAS, District Collector & District Magistrate, Rangareddy District.	District Collector & District Magistrate, Rangareddy District.
2.	Sri M. Venkanna, Environmental Engineer, T.S. Pollution Control Board, Regional Office-1, Rangareddy District.	Representative of the Telangana State Pollution Control Board

The following representatives of Irrigation & CAD Department, Government of Telangana and Other Officials were present:

S. No.	Name & Designation
1.	Sri A. Satyanarayana Reddy, SE, Irrigation & CAD Department, PRLIS, Hyderabad.
2	Sri. G. Lakshmipathi Naidu, AGM , IP&D, M/s. Voyants Solutions Pvt Ltd., Hyderabad.

At the outset, the Environmental Engineer, Regional Office, Rangareddy District, TSPCB, invited the people gathered at the venue and public representatives and other officials to the environmental public hearing held for the Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) proposed by Irrigation & CAD Department, Government of Telangana at Sri Venkateshwara Function Hall, Talakondapalli, RangareddyDistrict. He invited the District Collector, Rangareddy District to occupy the dais and conduct the public hearing in accordance with the procedure laid down in the Environment Impact Assessment Notification (EIA), 2006 issued by the Ministry of Environment, Forests and Climate Change, Government of India. While explaining the salient features of the EIA Notification, 2006 S. O. (E) No.1533, dated 14-09-2006 and its subsequent amendments issued from time to time, he stated that the public hearing was a mandatory process for Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) as the project is classified as Categroy A of River Valley Projects listed at Sl. No.1C (ii) as per EIA Notification, 2006. He also stated that the intimation of public hearing was published in 'Namesthe Telangana', Telugu Newspaper and in 'Telangana Today' English Newspaper on 10.07.2021. The draft EIA report along with Executive Summaries in Telugu and English on the project was displayed at the offices of the local bodies and the Collectorate to enable the people to access the information. The environmental public hearing is being

held to elicit the views, opinion, suggestions and objections if any on the proposed project. He requested the intended speakers to furnish their names on the slips suppled to them to enable them to call their names in serial order. He also informed that the entire proceedings would be video graphed and held in transparent manner without any editing, for sending the same to the higher authorities for taking further action. He then requested the Collector, Rangareddy District to conduct the proceedings of Public hearing.

The District Collector & District Magistrate, Rangareddy District while inviting the people gathered at the venue, requested them to follow the rules of the meeting. He stated that the public hearing was a mandatory process for obtaining Environmental Clearances for the Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) and people can freely elicit their views, opinion, suggestions and objections if any on the proposed project. He also requested the people who intended to offer their opinion to send their names with their villages on a paper slips circulated to them after the presentation by the representatives of the I&CAD Department. He stated that the entire proceedings of the environmental public hearing would be video graphed and sent to the competent authorities for taking a decision. There would be no final verdict on the proposal except furnishing clarifications on the issues related to environment during this public hearing. He stated that the issues related to compensation would be paid as per the provisions of latest Land Acquisition Act, 2013. He stated that the time frame for the public hearing was fixed between 11.00 AM to 01.00 PM. He advised the public to utilize the time judiciously and not to dwell on the same points raised by the (predecessor) speakers, who already raised the same points. He then requested SE, Irrigation & CAD Department to explain the salient features of the proposed project and presentation on draft EIA report by representative of Environmental Consultant.

Sri A. Satyanarayana Reddy, SE, Irrigation & CAD Department, PRLIS, Rangareddy: After customary welcome address to all the public representatives, the District Collector, other Officers and people present at the venue, he explained the project details as follows:

- PRLIS is intended to supply clean potable water to the upland and water scarce areas of five drought prone districts namely:-Mahabubnagar, Nagarkurnool, Rangareddy, Vikarabad and Nalgonda, which are listed as the most drought prone semi-arid places in the country.
- The people of these areas migrate seasonally to eke out their livelihood as the areas were subjected to seasonal droughts.

- Percentage of cultivable areas in the above districts is meager compared to the total geographical areas in these districts and percentage of irrigated area is still lesser.
- To overcome this problem, Government proposed to lift 90 TMC ft of water over a period of 60 days during the flood season from the foreshore of Srisailam Reservoir on Krishna River through 5 stages and 6 reservoirs by providing irrigation to 12,30,000 acres of land in 1226 villages of 70 mandals of 6 districts, apart from providing drinking water to people and to meet the needs of industries.
- The project has Water Storage/Capacity of 90 TMC (82.52 TMC for Irrigation, 7.15 TMC for Drinking water supply and 0.33 for Industrial Use. The Budget of the project is Rs. 52,056.31 cr and BC ratio is 1.25:1.
- The 1st Phase consisted of drinking water and industrial needs, irrigation canals, approach channels, tunnels including 5 reservoirs known as (1) Anjanagiri (2) Veeranjaneya (3)Venkatadri (4) Kurumurthiraya (5) Udandapur (6) K.P. Lakshmidevipally. Works on reservoirs, approach channels and pump houses are in progress at present.
- Under 2nd Phase canals would be dug up from Kurumurthiraya, Udandapur and K.P. Lakshmidevipally reservoirs over a length of 915 .47 kms under the project extending over 33 villages of 20 mandals in Rangareddy District. The above reservoir supplies water to 3,59,000 acres in this district.
- Only canals will be excavated in this district and no storage reservoir is falling in this district. The total extent of land acquisition will be only 3533 acres of land only. Thus the District is benefitted.
- This project on completion helps to improve ground water table, increase the area of cultivation, enhanced socio-economic conditions of the people. Employment to the local people due to increase in fishery, animal husbandry resulting in increased productivity of dairy products, improvement of infrastructure facilities such as developed road net work. The other important sector is entertainment and tourism sectors to provide which will also generate employment.

Sri. G. Lakshmipathi Naidu, AGM , IP&D, M/s. Voyants Solutions Pvt Ltd., Hyderabad After customary welcome address to the chair, officials, NGOs and people present at the venue of the hearing, he explained the following environmental details consisting of parameters, predicted impacts and mitigation measures as detailed below:

- Baseline studies were carried out during monsoon of 2019, post-monsoon 2019 and Pre-monsoon 2020 at 6 locations in the project area.

- EIA and EMP was prepared as per the ToR issued by the MoEF&CC vide no. J-12011/31//2017-IA-I (R), dated 11.10.2017 and it is valid till 10th of October, 2021.
- Public hearing notifications were issued on 10-07-2021 and accordingly this public hearing is conducted here.
- The project is divided into two stages. 1st stage consists of drinking water and 2nd stage consists of irrigation water and water will be drawn from the foreshores of Srisailam project during the flood season.
- Drinking Water Coverage has five Distrits viz., Mahabubnagar, Nagarkurnool, Nalgonda, Narayanpet, Vikarabad, Rangareddy district and Hyderabad city.
- Irrigation Coverage has 1226 villages, 70 mandals in 6 districts (Mahabubnagar, Nagarkurnool, Nalgonda, Narayanpet, Vikarabad, Rangareddy); Command Area: 4,97,976 Ha.; Length: 915.47 Km.
- Stages of Supply is from 6 Balancing reservoir in Anjanagiri, Veeranjaneya, Venkatadri, Kurumurthyraya, Udandapur and Lakshmidevipalli; 5 stages of lifting and followed by utilization by gravity flow.
- The project has Water Storage/Capacity of 90 TMC (82.52 TMC for Irrigation, 7.15 TMC for Drinking water supply and 0.33 for Industrial Use. The Budget of the project is Rs. 52,056.31 cr and BC ratio is 1.25:1.
- Reservoir and canal wise ayacut details as furnished in the DPR.
- The parameters monitored are Ambient Air Quality; Ambient Noise Quality ; Soil Quality ; Ground Water Quality and Surface Water Quality.
- **Micro-climate:** Short Term effect on temperature and humidity due to construction work during construction phase and there will be no effect during Operation Phase. Controlled construction process needed.
- **Land-use**: Agricultural/non-agricultural land will be permanently changed to Water body. Improved and planned land-use development through planning will reduce the impact.
- **Soil Quality**: Medium impact on soil erosion, due to blasting, excavation of work during construction and no major impact during operational phase. Adoption of staggered operations along the canal alignment. The top soil will be retained and used for bunding and greenbelt development as part of mitigation measure.
- **Air Environment**: Possibility of medium to high Dust Pollution during construction phase and there will be no major Impact during operation phase. Suggested to undertake controlled operations with regular maintenance of roads. Regular pollution monitoring is required.
- **Impacts on Noise:** Possibility of medium to high noise pollution during construction period. However no major Impacts anticipated during operational

phase. Suggested for raising of multiple row plantations to serve as acoustic noise barrier.

- **Impacts due to Blasting:** Air pressure will be increased due to blasting and anticipated range of noise will be in the range of 103.2 -109.8 dB(A) respectively and within stipulated 120 dB(A). Controlled and planned blasting as per the Geological planning and blasting will not be undertaken within 300 m of settlements and habitations. To reduce any adverse impact it is suggested to follow approved blasting plan for undertaking tunneling and other major works.
- **Water Environment**: Possibility of increase of solid and silt concentration in river water. There is a possibility of water Logging in certain pockets due to land terrain and its geography. As a mitigation measure it is suggested to undertake controlled excavation in canal system and adoption of restricted excavation during monsoon season to avoid water logging.
- **Geology:** Only localized and low impacts are anticipated. Suggested to take up controlled and planned blasting according the geological status of the area.
- **Hydrology**: Anticipated net ground water recharge is 970.24 MCM. Suggested regular monitoring to prevent the uncontrolled seepage in certain pockets resulting in accidental discharge into canals.
- **Flora**: There are no vulnerable or endangered species in the vicinity of project area. Suggested to raise avenue and multiple row plantations along the canal bunds and entire canal network area. Compensatory afforestation shall be taken up as part of setting up of camps in forest areas during construction phase.
- **Fauna**: As there is no alteration to the existing habitat of endangered and threatened species due to construction of project. However, it is suggested to undertake controlled construction near forest areas to avoid disturbance to the natural setting of the forest areas in the vicinity.
- **Socio-economic Condition**: There will be improvement in income levels due to irrigation and cropping intensity due to regular water supply. Project will improve socio-economic condition of the area and people will get sustained and regular income.
- **Environment Management Plan**: Proposed to spend Rs.1744 crores on maintenance of environment and ecology. The main components are Command Area Development, Resettlement and Rehabilitation Plan, Greenbelt Development Plan, Solid Waste Disposal, Projected Environment Monitoring cost will be Rs.228 lakhs.
- **Acquisition of Land:** Compensation to the land will be paid as per the RECT LAAR Act 2013. The compensation will be paid depending on the market value

and multiplication factor will be maximum 2 in rural areas and 1 in case of urban areas.

- **Solatium:** Solatium will be paid based on market value and with multiplication factor on the market value and value of assets attached to the land put together.
- The estimated cost of under R&R will be Rs.1566.86 crores.

The District Collector, Rangareddy District, stated that the officials of the Irrigation Department explained the silent features of the project and the EIA consultant gave out environment details and mitigation measures also. He requested the public to offer their views, suggestions and opinion one by one as per the slips received from the public.

1. Sri T. Khagendar, C.E.(Retd.): The project proponents explained technical details. As per record, the undivided districts of Mahabubnagar, Nalgonda and Rangareddy were drought prone districts in entire Telangana State. He drew comparison with the prosperity of command area of Jurala project prior and after construction, which benefitted the people. This project would help not only the agriculture, but also other connected sectors like fisheries, dairying etc. He therefore requested the people to extend their support to the proposal.

2. Sri N. Patya Naik, Ex-MPTC, R/o Mityagunta Tanda, Amangal (M): He stated that Kalwakurti Taluk in particular and Mahabubnagar in general were drought prone areas. By November-December, the tanks used to dry up, forcing people to migrate to places like Hyderabad or Mumbai. There were several tandas in this region and people in general were poorer and dependent on dry land agriculture. He was grateful to the Government for providing drinking water under Mission Bhagiratha to all such villages. He hoped that Ground Water position would improve further after construction of this canal. He cited that his relative who was the owner of 10 acres of land dug up 15 borewells without any success. He sold away all his land and presently working as auto driver in Hyderabad. He requested for filling up of two important tanks in Ammanagal Mandal namely Surasamudram and Settipalli and the former one supplied drinking water to Amangal. He supported the proposed project.

3. Sri T. Dasaradh Naik, ZPTC, Kadthal: After customary welcome address, he considered this day as an auspicious day for farmers of this area. He cited the example of Nagarkurnool, Kollapur and Kalwakurti areas, which became prosperous after the supply of canal water and hoped that situation would improve here also. He cited the example of his relative, who left his 3 acres of

land in Ellikal Tanda and migrated to Mumbai in search of employment about 7 years back. As the area was covered by Kalwakurti Lift Irrigation Project, he could cultivate paddy in his land and able to generate sufficient money to lend to others. As the proposed project benefits 70,000 acres of land in this mandal, the people of this area comprising 222 tandas would be benefitted which would also obviate the problem of drinking water shortage faced by them earlier and the area would be prosperous like other areas.

4. Sri Chanduji, R/o. Kadthal: After customary welcome address he stated that many families migrated from this area. Being a rain fed area drought was frequent and people were facing difficulties. He thanked the Government for sanctioning this project. There would be no detrimental or adverse impact on industries, vegetation and cattle wealth due to this project. He also opined that there would be no adverse impact on surface or ground water including environment and ecology of this area and he hoped that necessary mitigation measures would be taken by the concerned authorities. He suggested grouting and canal lining to arrest erosion of soils and raising canal bank plantations. He opined that tourism & fisheries should be developed by preserving environment and ecology of the area. The socioeconomic condition of the people would be improved due to provision of water for two crops. He hoped that this project would enhance environmental conservation and preservation of biodiversity.

5. Sri Madhusudan Reddy, R/o. Kadthal: He stated emphatically that environment would improve due to the proposed project and enhanced vegetative growth which would result in increased precipitation. He stated that there was misapprehension over Talakondapally not getting water due to its location. It would be noteworthy that 21 villages under Talakondapally Mandal were covered under this project. He hoped that this project would be completed expeditiously within 2 years like Kaleshwaram project which took 3.5 years for its completion.

6. Sri. S. Muthyam Reddy (SEE Retd. R&B, Telangana Retired Engineers Association): He stated that undivided Mahboobnagar was considered as backward district among other districts which was endowed with scanty rainfall off 600mm on an average. Except Hyderabad city all other districts were under developed at that time. Area under irrigation by gravity was very less in Telangana due to topographical conditions and lifting of water was the only solution to ensure integrated development of the region. He opined that there would be no adverse impact due to the proposed project and people would not object for this project.

7. Sri. G.Lakshmi Narsimha Reddy, Sarpanch, Kadthal: He has stated that elevation of Srisailam reservoir is 270m, whereas the level of Laxmidevipally reservoir is 670m. Relevant Government orders were issued on 08.08.2013 for pumping the water from Srisailam foreshore to arrest migration of people. He complimented the engineers for construction of reservoirs thereby water would be made available at the doorsteps of the villagers in 23 villages. Similarly, fisher folk would also be benefitted. Greenery will be developed in all these areas which would improve the environmental conditions.

8. Sri J. Ananth Reddy, Vice MPP: He stated that the people of this area were hardworking. He hoped that government would speed up the implementation of the project for the benefit of the people.

9. Sri. Appam. Srinu, Amangal: He narrated that Palamuru was considered as a prosperous region earlier and became drought prone subsequently. He thanked the government for sanctioning this project to benefit 60% of the area there would be no adverse effect on the environment and would not pose any problem. In fact the ground water table would be improved and urged the government to speed up the pace of the project.

10. Sri. D. Satyanarayana, Vice-Chariman PACS, Polepally(V), Amangal (M): After customary address he stated that the area was dependent on monsoon for its sustenance. He hoped that after excavation of canal, this area would be greener. He compared Kaleshwaram and PRLIS were started simultaneously but the former was commissioned and hoped this project would also be completed on warfooting.

11. Sri. R. Tirupathi, Upasarpanch, Devuni Padkal (V): After customary address he stated that the farmers of this region suffered due to failure of monsoon and drying up of borewells. He hoped that the dependence on borewells for irrigation and drinking water would come down after commissioning of this project.

12. Sri. K. Ramakrishna, Upasarpanch, Kadthal(V&M): After his opening address, he fervently hoped that the area covering 20 mandals would be developed due to the proposed irrigation project. He stated that 3200 acres of land would be covered under this project. He supported the proposed project as it would ensure all round development of the area.

13. Sri. B. Kumar, R/o Polepally, Amangal(M): He complained that their Gram Panchayat was not benefitted and appealed to re align the canal through higher elevation to fill water into Voorasamudram and Settipally tanks. This step would also benefit Madgul mandal also.

14. Sri. Paramesh, District Rythu Member, Kadthal(M): He stated that lifting of 90 TMC ft of would provide irrigation to more than 12 Lakhs acres of land, if not, number of borewells would have to be sunk to irrigate this extent. He appealed to the people to extend their support to the project, as this would benefit lakhs of people on completion of this project.

15. Sri. Lachiram Nayak, R/o. Vasudevapur, MPTC, Karkalpahad: After customary address he stated that people would get engaged during monsoon season in their respective villages. During dry season, the people would migrate and work as construction labour in urban areas. He hoped that there would be year round employment in their respective villages on completion of this project.

16. J. Veeraiah, Rythu President, R/o. Kadthal: He drew comparison of Kaleshwaram project where tanks were filled to raise 2 crops in an year, which would enable to improve their socio-economic conditions. He cited the example of Kadthal and Amangal Mandals where they could raise 2 crops last year due to bountiful rainfall. He extended his support to the project.

17. Sri. Srinivas Yadav, R/o. Talakondapally: While welcoming the project proposal, he stated that 21 villages of this mandal would be covered by this project. He hoped that this project would be completed within 2 years as was the case with Kaleshwaram Project which was completed within 3.5 years. He sought filling up of Sahadevasamudram lake to benefit 2000 acres of land and complimented the government for providing 52 crores for the water users association to cater to the needs of Mission Kakatiya and Mission Bhageeratha.

18. Sri. G. Venkatesh, PACS Chairman, Kadthal(M): After customary address he stated that people cultivated their land last year and reaped 30 bags per acre. Whereas the farmers under irrigation projects harvested 60 bags per acre. He opined that there would be no adverse environmental impacts due to this project and fisherfolk would be benefitted. He concluded his views by comparing this irrigation project with Mining projects which would invariably cause environmental degradation.

19. Sri. Sudhakar Reddy, MPTC: After customary address he stated that there would be no objection to the proposed PRLIS. He opined that water continued to be the important and main input for all round development of the area and congratulated the government for grounding this project.

20. Sri. K. Shankar R/o. Padkal(V): He expressed his profound happiness over the supply of water to this area. He complimented the government for the supply of electricity round the clock and cited the example of filled up godowns with food grains as a major achievement of the government. He hoped that people would definitely support this project in view of its importance as a lifeline.

21. Sri. Srinivas Reddy, R/o Chikkapur: He complimented the government for implementing irrigation and drinking water schemes. This measure would enhance the productivity of agriculture lands. He requested the government to speed up the execution of this project.

22. Sri. J. Ramesh, MPTC, R/o Padkal: After customary address he stated that this project would invariably benefit the people at large however there would be loss to some farmers who were losing their lands due to acquisition for construction of canals. He demanded employment in government for all those land losers. He appealed to the government to pay the compensation after considering the prevailing market rates to the lands. He also opined that most of the land losers are small and marginal farmers and require support from the government by way of payment of enhancement compensation to their property. He supported the proposal.

23. Sri. G. Yadagiri, R/o Talakondapally (V&M): He extended his unequivocal support as this project would benefit the people of this area. He brought out his own experience where he dug up 2 borewells which were failed and left him in debts. He exhorted the people to lend their support without any hesitation. He has claimed that Padkal village is at higher elevation and the two tanks in the village should have to be filled up to benefit more number of people.

24. Sri. L. Mohan Reddy, R/o. Madhurapuram: He claimed that the elevation of Shadnagar was 420m above MSL, whereas the elevation of Laxmidevipally reservoir was stated as 625m. He stated that several farmers sold away their lands due to lack of water for irrigation purpose. There would be no adverse impact due to this project. He congratulated the retired engineers for envisaging a scheme to pump water from Jurala project in which Laxmidevipally would

have become the first reservoir to receive the water. However, in the new scheme it became the last one to receive the water. He also requested the government to enhance the capacity of reservoir as envisaged earlier which stood reduced in the new scheme. There would be no adverse impact on environment infact it would benefit other dependent activities such as fisheries, horticulture and animal husbandry. He appealed to the government to expedite the execution of works on Laxmidevipally reservoir.

25. Sri. Narayana R/o. Aakuthotapally: He described the plight of people of his village where 75% of people migrated to other places in search of employment/work. He hoped that this project would help local people in providing year round employment.

26. Sri. Y. Narasimha R/o. Makthamadharam: He stated that the canals would be useful to the farmers who were not able to secure year round employment. He appealed to the government to render justice to the farmers who lost their lands under acquisition process. He sought Rs. 75 Lakhs per acre irrespective of registered value. People would feel happier if adequate compensation paid to them as per the provisions of latest L.A. act 2013.

27. Sri. D. Giri Yadav, R/o Amangal(V): He stated that undivided Mahboobnagar District was drought prone and this project would become a boon to the people. He opined that there is no adverse environmental impact due to construction of this project.

28. Sri. B. Jagan Reddy, R/o. Cheepununthala: He stated that there would be no objection from people for obtaining environmental clearance to this project. He requested that there were several tanks with less water spread coverage and cited one such tank of 52 acres in his village which should also be filled up under this project. He appealed to the government to fill up all minor irrigation tanks.

29. Sri. Bala Krishnaiah, R/o. Veljal(V): He complained that the farmer with 10 acres of land would not be able to compete with a farmer having 1 acre of land under Kaleshwaram Project. He requested the government to speed up the work.

30. Sri. K. Mallesh, R/o. Devunipadkal(V): He has stated that water is a basic need and requires frequent filling up of tanks from a permanent source. Several farmers ran into debts due to non-availability of water for crops and also failure of borewells. He hoped to overcome this problem on completion of PRLIS.

31. Sri.Ch. Ramesh, Sarpanch, Padkal(V): He expressed his apprehensions over payment of compensation. He appealed to the government to render justice to the land oustees under the provisions of the latest L.A. act, 2013.

32. Sri. Mohanlal, R/o. Veljal(V): He stated that he owned 44 acres of land and dug up more than 40 borewells. He expressed his anguish by reciting a poem. He felt that there would be no damage to the environment on account of this project.

33. Sri. Rahman, R/o. Veljal(V): While welcoming the project, he cited his feelings through a folk song. He confided that there would be all round development in agriculture sector and requested to fill up Sahadevasamudram lake.

34. Sri. K. Bheeshma Chary, Charikonda (V): He sought adequate compensation to the land oustees and requested the irrigation department to fill up Gouramma Cheruvu to benefit their village. He extended his full support to the project proposal.

35. Sri. J. Krishna Goud, R/o. Devunipadkal(V): He requested for speedy execution of the project, as the delay would result in loss of crops as well as lives. People tend to drive the cattle to the slaughterhouses due to non availability of fodder during dry seasons. He alleged that most of the farmers ran into debts and selling their cattle to sustain themselves.

36. Sri. B. Kumar, R/o. Chandradhana(V), Talakondapally(M): He felt that 77 years lapsed after independence without any development in their village. He sought justice for payment of adequate compensations to the lands. He demanded payment of market rate as basis for calculating compensation as was adopted in the case of Kaleshwaram project. He contended that this step would enable to overcome the problems of land acquisition and adoption of same process of payment of 3 times of the market value.

The Superintending Engineer, I&CAD Dept. thanked the public for expressing their views, opinions and suggestions on this project. He assured to examine the issues raised by the people and would take necessary action as required.

The District Collector requested the EE, TSPCB to summarise the issues raised by speakers during the public hearing.

The EE, TSPCB summarized the issues raised in the public hearing by stating that:

Total 36 speakers expressed their views, suggestions, opinions and 3 written representations were received. He further informed that all the suggestions were

recorded and un-interrupted video & audio will be sent to MoEF&CC, New Delhi for taking necessary action.

The District Collector, Rangareddy District concluded the public hearing stating that all the suggestions were recorded and un-interrupted video & audio will be sent to MoEF&CC, New Delhi for taking necessary action.

The public hearing was concluded.

Representations received in this connection are enclosed as annexure.

Sri M. Venkanna,
Environmental Engineer
T.S. Pollution Control Board
Regional Office-I,
Rangareddy District

Sri. Amoy Kumar, IAS,
Collector &. District Magistrate,
Rangareddy District

REPRESENTATIONS RECEIVED FROM VILLAGERS, NGOS & PUBLIC REPRESENTATIVES PRIOR AND DURING EPH.

Sl.No.	Representations given by	Date of Receipt	Content of the representation
	Sarvasri		
1.	Sri D.Mohan Reddy, R/o. Talakondapally	10.08.2021	1. To expedite the PRLIS Project. 2. To compensate land oustees @ 75 Lakhs per acre 3. Debt Relief upto 1 lakh 4. To provide 24 hours electricity and to replace steel electric poles with cement poles.
2.	Sri M.Satyanarayana, PHC, Manava Vanarula & Vikalangula Sankshema Sangam, Saroornagar, Rangareddy District	10.08.2021	1. To provide re-plantation of uprooted trees. 2. To mitigate fugitive dust emissions 3. To Plant fruit bearing trees on the either side of canal bund. 4. To educate people about organic farming. 5. To provide 5% reservation in employment for differently abled.
3.	M.Bachaiah, Founder & Gen. Secretary, Environmental Pollution Control Awareness Society, Hyderabad	10.08.2021	1. To Plant fruit bearing trees on the either side of canal bund. 2. LADP Funds to be used for development of surrounding villages. 3. Compensation should be given to land losing farmers. 4. To conduct health camps. Referred MoEF & CC to get permission.

Public Hearing Attendance Sheet

Vikarabad

పర్యావరణ ప్రజల వ్యయ నివేదిక

నీటిపారుదల మరియు క్యాడ్ విభాగం

తెలంగాణ రాష్ట్రము – ప్రతిపాదిత పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ పథకము, నాగర్ కర్నూల్, రంగారెడ్డి మరియు వికారాబాద్ మరియు నల్గొండ జిల్లాలు.

వికారాబాద్ జిల్లా

తేది: 10.05.2021 సమయం: 11.00 ఉదయం

ప్రదేశం: పూడూర్ మండలం నాగిరెడ్డిపల్లి, కొడంగల్ రిజర్వ్ ఫారెస్ట్, పరిధి.

వికారాబాద్ జిల్లా

క్రమ సంఖ్య	పేరు & హోదా	సంతకం
1	Narsimha videographer	
2	[illegible] Chitkul	
3	K. Aravinda Reddy	
4	T. Venkatraj Pargi	
5, 6	[illegible] Naidu Reddy Syedraj	
7	M. Ashok Pargi.	
8	G Ramkumar Poopalwadi	
9	[illegible] Salweed.	
10	E Kondaiah	
11	M. Santosh Gopalkingarpur	
12	S. [illegible]	
13	S Sudhakar Reddy Mallipur	
14	Ramdas ZPTC M.V. Pur	
15	[illegible] Kadlakhelma	
16	వెంకట్ రెడ్డి మహారాజ్ పేట్	
	భీమయ్య బంధితోపల్లి	
17	B. Mohan Reddy. [illegible]	
18	M. Ramdas Reddy "	
19	[illegible]	
20	[illegible] రుక్కయ్య [illegible]	
21	U. Yadaiah Dasnalpally (Sarpanch)	

3/పుస్తకం	పేరు & చిరునామా		సంతకం
22	G. కృష్ణ మూర్తి	ఉప్పల్	
23	[illegible]	కరీంనగర్	
24	D. Lal	[illegible] Wadtal	
25			
26	పవన్	కరీంనగర్	
27	పవన్	కరీంనగర్	
28	S. Narayan Reddy	Bonakpet (V&M-HBT)	
29	MEER TAHERALI	PARGI 9885939303	
30	కిరణ్ కుమార్	మంచిర్యాల	
31	S. Mahendar Reddy	Bomraspet 9618032809	
32	P. Sathish	Laxmi Devi Pally	
33	S. శ్రీనివాస్	Kammarkhan	
34	A Damodar [illegible]	Jedpally	
35	J. Kalai P-1	Pkm 9440411381	
36	K. Samya Nazeerabad	9666279987	
37	MD. Khaja Qutub	DOMA	
38	[illegible]	[illegible]	
39	J. Gunavardhan	Malla Pally	
40	venkatesh	పల్లి	
41	Ramulu	[illegible]	
	KV చంద్రయ్య	నారాయణ పేట	
	M. Jagadish	Keravelly	

Environmental Public Hearing
irrigation and CAD Department, Govt. of Telangana - Proposed RR the Palamuru - Ranga Reddy Lift irrigation Scheme in Nagalkurthy, Ranga reddy, Narayanpet, Vikarabad & Nalgonda Districts - Vikarabad District

Date: 10.08.2021 Time: 11:00 AM
Venue: Bramhivan Garden, Kodangal Road, Parigi

S.No.	Name & Designation of the officer	Signature
①	Smt Pausumi Basu I.A.S District Collector & District Magistrate, Vikarabad	Pausumi 10.08.2021.
②	Sri P. Suresh Babu, Environmental Engineer, T.S Pollution Control Board	10/8/21

OTHER OFFICIALS

K. SRINIVAS Superintending Engineer Irrigation Mahaboobnagar	
S. MOTILAL, Addl-Collector, VKB	
K.V Ghander Reddy R.D.O, Vikarabad	
B. Sunder E.E/Irrigation/Vikarabad	
T. Ramesh EE/IDS/Tandur	
T. Madhusudan EE/Irrigation/Chevella	
M. Pandu Sagar DEE/Doma.	
K.V Krishna Reddy DEE/ISD/Parigi	
K. Raghavendra, AEE/Irrigation/Parigi	
R Gopinath AE/Doma Mandal	

4

S. NO.	Name & Designation of the Officer	Signature
	A. JAYAPAL KUMAR DEE/PRLIS/DVS	
	M. Neelima, DEE/PRLIS/DVS-5	
	D Ravi kumar DEE/Vikarabad on	
	A. Ranga Reddy SE/IC/Chevella & surveil. AE/Digitization Div No:5/ Chevella	10/08/2024
	G. Venkatalaramana DEE/ISD/Chevella	10/8/2024

ఉమ్మడి ఖమ్మం జిల్లా పాత్రికేయుల సమావేశం

నూతనంగా ఏర్పడిన కొత్తగూడెం జిల్లా,
అందులో కొత్తపల్లి - ఖమ్మంతో పాటుగా కొత్తగూడెం
జిల్లా, భద్రాచలం డివిజన్, పాల్వంచ, కొత్తగూడెం, పాలేరు నియోజకవర్గాలు,
మధుసూదన్, వెంకటాపురం మరియు సత్తుపల్లి నియోజకవర్గాల విలేకరులతో కొత్త

తేదీ : 10.08.2021 సమయం: 11.00 గంటలు
ఎజెండా : ఖమ్మం పని కొత్తపల్లి, కొత్తగూడెం కొత్త పని.
విలేకరుల జాబితా.

క్రమసంఖ్య	పేరు & చిరునామా	సంతకం
1)	[illegible]	[illegible]
2	K. Venkat Reddy [illegible]	[illegible]
3	B. Anjaneyulu Raghavapuram	[illegible]
4	A. Jagan Raghavapuram 8688499212	[illegible]
5.	G. Venkataiah Raghavapuram 9948121937	[illegible]
6	Saidupalle	[illegible]
7	S. Venkat Ram Reddy Kukatchal	[illegible]
8	C. Praveen kumar. 9618753146	[illegible]
9	[illegible]	[illegible]
(10)	K. Subash. Chigurupadu 9390917492	[illegible]
11	G. [illegible]	[illegible]
12	[illegible]	[illegible]
13	[illegible]	[illegible]
14	P. [illegible]	P. [illegible]
15	B [illegible]	B [illegible]
16	G. Mahipal [illegible]	G. Mahipal
17)	[illegible]	[illegible]
18	R. [illegible] Rukumpad4 · 9781168875	R. Mallesh
19)	V. Raghavulu Wadral	[illegible]
20)		

19

29

(illegible)			
51)	Gonal Laxmiyan	Chapalapuram	
52)	B. Raj Reddy	Domkurpalli	Bon Reddy
53)			
54)	P. వెంకటయ్య	చేపలకుంట	P. వెంకటయ్య
55)	T. Durga prasad	Pargi	T.
56)	Bhupal kumar	Pargi.	
57)	B. Parashuram Reddy	Gyedpally	B Reddy
58)	V. Damodar	Ramnagla	V
59)	P. Amarya	Pothu Reddy palli	Amarya
60)	K. వెంకటయ్య	కేశవాపూర్	
61)	G. Laxmaiah	K. Somaiah	
62)	D. వెంకట్	వంశీ	D. వెంకట్
63)	K. Keerthi	Rakamcherla	Keerthi
64)	A Narsimulu	Syedpally	
65)	NARESH	PARGI	
66)	ఎల్లయ్య & ఎల్లమ్మ		ఎల్లయ్య
67)	L. Vijay	వంగపల్లి	Vijay
68)			
69)			
70)	B Ramulu	madhuram	B Ramulu
71)	M. Habib	PARGI	M Habib
72)	CH. రాములమ్మ & ఎల్లి		
73)	కె. ఎల్లమ్మ & ఎల్లి		
74)			Ravuf
75)	మంచోళ్ళ యాదగిరి	బ్రాహ్మణపల్లి	Yadagiri
76)			
77)	వెల్లమ్మ & ఎల్లి		
78)	K. Hanmanthu	Pargi	
79)	గంధం నాగయ్య & ఎల్లి		గంధం నాగయ్య
80)			

25

వర్షాధారిత ప్రభుత్వేతర సేవారంగ
ప్రతిపాదిత నీటిపారుదల మరియు క్రోడీకరణ.
తెలంగాణ రాష్ట్రము. – ప్రతిపాదిత పాలమూరు రంగారెడ్డి
లిఫ్ట్ ఇరిగేషన్ పథకం, నాగర్‌కర్నూల్, రంగారెడ్డి, మహబూబ్‌నగర్
వికారాబాద్ మరియు నల్గొండ జిల్లాలు
వికారాబాద్ జిల్లా

తేది: 10.08.2021 సమయం: 11.00 గంటలు

ప్రదేశం: శ్రీ.బి.వి.ఎస్. నర్సింహ, కలెక్టరు గారి కార్యాలయం, పరిగి,
వికారాబాద్ జిల్లా

క్ర.సం.	పేరు & హోదా		సంతకం
1)	G. Chennaiah.	Chityal	G. Chennaiah.
2)	[illegible]	Godivagupur	
3)	[illegible]	[illegible]	
4)	B. Ravi Kumar.	Parigi	
5)	[illegible]	[illegible]	[illegible]
6)	[illegible]		
7)	P. Venkataiah	Syadigudda	P. Chiraiah
8)	[illegible]	[illegible]	[illegible]
9)	S. [illegible]	[illegible]	[illegible]
10)	G. Ramunder Reddy	Parigi	Reddy
11)	P. Hari Tejavardhan	Parigi	P. Tejavardhan
12)	[illegible]	[illegible]	
13)	M. Ramlal MPDC	Kulkacherla	Ramlal
14)	S. Srinivas	Mujahidpur	S. Srinivas
15)	C. Chandra Shekar	Mujahidpur	C. Shekar
16)	P. Shiva Kumar	[illegible]	P. Shiva
17)	V. Shiva Reddy	Syadireddy	V. S. Reddy
18)	K. [illegible]	[illegible]	[illegible]
19)	G. [illegible]	Nagaram	[illegible]
20)	[illegible]	[illegible]	[illegible]

(20)

క్రమసంఖ్య	పేరు	ఊరు	సంతకం
21)	[illegible]	[illegible]	
22)	M. Venkatesh	[illegible]	M. Venkatesh
23)	S. SHANKAR, NARMAL	MALKAPUR	S. Shankar
24)	K. Muralee	Bansi	Murali
25)	G. Ramesh	[illegible]	Ramesh
26)	L. Pambha	ISHAKHIPUR	[illegible]
27)	[illegible]	[illegible]	[illegible]
28)	[illegible]	[illegible]	[illegible]
29)	Shivakumar K	Lingapally	[illegible]
30)	M. D. Nasir	Venkatapalli	M. D. Nasir
31)	Lab — Peshq	Bompally	Rao
32)	[illegible]	Kamal	[illegible]
33)	C. [illegible]	Chikyal	[illegible]
34)	[illegible]	[illegible]	[illegible]
35)	Parvathalu	Sadak	[illegible]
36)	S. [illegible]	Nirmal	S. [illegible]
37)	[illegible]	KKL	[illegible]
38)	Srinivas	Basireddypally	[illegible]
39)	P. Venkat	[illegible]	P. Venkat
40)	[illegible] (Forest)	[illegible]	[illegible]
41)	[illegible]	[illegible]	[illegible]
42)	P Ravikumar	[illegible]	[illegible]
43)	A. Ashanaik	Pargi	[illegible]
44)	C. Shankaraiah MPTC	Mamtha Venkatapur	[illegible]
45)	G. Laxmidevi	Laxmidevi Pally	G. Laxmi
46)	P. Srinivas	Kesavulu	P. Srinivas
47)	MB Jangaiah	Bajaru	MD Jangaiah
48)	P. Venkatesh	Kolmoor	P. Venkatesh
49)	K. Manohar Reddy	[illegible]	[illegible]

	59)	K: Manch Qual zwei Konzepte	(Pf)

పర్యావరణ ప్రజాభిప్రాయ సేకరణ
నిర్వహణ మరియు కోడ్ విభాగం, తెలంగాణ రాష్ట్రము
ప్రతిపాదిత బాలమోరు రంగారెడ్డి లిమిటెడ్ స్థిరీకరణ పథకం, మహబూబ్‌నగర్
నాగర్ కర్నూలు, రంగారెడ్డి, నారాయణపేట, వికారాబాద్ మరియు
వనపర్తి జిల్లాలు.

వికారాబాద్ జిల్లా

తేదీ: 10.08.2021 సమయం: 11.00 ఉదయం
ప్రదేశం: శ్రీ వెంకటేశ్వర కాలనీ, తాండూర్ రోడ్డు, వికారాబాద్ జిల్లా

క్రమసంఖ్య	పేరు & హోదా	సంతకం
1.	M. Satish Reddy SE retd.	
2.	G. Srinivas Reddy, EE	
3.	MD. JAFAR Syed Pally	
4.	E Rafiq SYED PASHA	
5.	K. Shyamsunder Reddy Barkathpally	
6.	R. Anjaneyulu R/o Rukumpally	
7.	S. Ramesh	
8.	P Hanmanth Reddy 6281800039 Rajanapur	
9.	V. Ravindra parigi 9866394393 పాలకుడు వెంకటేశ్వర్లు	
10.		
11.	G. వెంకటేశ్వర్లు	
12.	K. వెంకటులమ్మ	
13.	K. వీరమ్మలు	
14.	[illegible]	
15.	M. రాజేందర్	

క్రమ సం	పేరు	వూరు	సంతకం
16			
17	K. Venkatha Reddy	Settipalli	
18	M. Krishnamoorthy	Kulkacherla	
19	G. Srinivas	Roopkhanpet	
20	P. Papa Rao	Roopkhanpet	
21	A. Laxmi Kanth	Pangi	
22	V. Krishnaiah	Pally	
23	B. Ramareddy	Roopkhanpet	
24	S. Venkatiah	Roopkhanpet	
25	[illegible]	Peddathanda	
26	K. Mallaiah	Tondapally	
27	D. Laxma Reddy	Yabagiri	
28	[illegible]		
29	S. [illegible]	[illegible]	
30	M. Babu	Chigurupally	
31	N Gopal	Barkath Pally	

క్రమసంఖ్య	పేరు	తండ్రి పేరు	సంతకం
32	[illegible]	భరతిరెడ్డి	
33	[illegible]	[illegible]	[illegible]
34	V. Yadla	[illegible]	[illegible]
35	K. [illegible]	[illegible]	[illegible]
36	[illegible]	[illegible]	[illegible]
37	[illegible]	[illegible]	
38	[illegible]	〃	
39	[illegible]		[illegible]
40	[illegible]	Jalam pally	
41	M. S. Reddy	Jalam pally	[illegible]
42	[illegible]	[illegible]	[illegible]
43	[illegible]	[illegible]	
44	[illegible]	[illegible]	
45	[illegible]	[illegible]	
46	[illegible]	[illegible]	[illegible]
47	M. [illegible]	M. [illegible]	[illegible]

8

48	[illegible]	[illegible]	[illegible]
49	[illegible]	[illegible]	[illegible]
50	A. Sukumar Patil	Nagkal Budlapur	[illegible]
51			
52	B. Krishna	[illegible]	[illegible]
53	[illegible]	[illegible]	
54	[illegible]	[illegible]	[illegible]
55	R. Anjaiah [illegible]	Syed Mallapur [illegible]	[illegible]
56			
57	G. [illegible]	[illegible]	[illegible]
58	Venkataiah goud	Bangram pally	[illegible]
59	G. Mailagam	Nagkal	[illegible]
60	V. Shankar.	Daffer pally	[illegible]
61	E. Narsimlu	[illegible]	[illegible]
62	N. [illegible]	Khanapur [illegible]	[illegible]
63	E. [illegible]	Khanapur	[illegible]

Code No	పేరు	ఊరు/పేరు	సంతకం
64	[illegible]	[illegible]	[illegible]
65	[illegible]	[illegible]	[illegible]
66	M Venkatesh	[illegible]	[illegible]
67	R. Vinay Kumar	Parji	[illegible]
68	K. [illegible]	[illegible]	[illegible]
69	[illegible]	[illegible]	[illegible]
70	[illegible]	[illegible]	[illegible]
71	[illegible]	[illegible]	[illegible]
72	G. Ramreddy	Parji	[illegible]
73	K. Sudhakar	M. pur - Chegunta	[illegible]
74	[illegible]	[illegible]	[illegible]
75	[illegible]	[illegible]	[illegible]
76	B. Praveen	Syed pally	[illegible]
77	[illegible]	[illegible]	
78	[illegible]	[illegible]	[illegible]
79	[illegible]	[illegible]	[illegible]
80	K. Omapathi Reddy	Chowdapur	[illegible]
81	K. Raja Reddy	Chowdapur	[illegible]
82	[illegible]	[illegible]	[illegible]
83	[illegible]	[illegible]	[illegible]
84	[illegible]	[illegible]	[illegible]
85	[illegible]	[illegible]	[illegible]
86	B. Babaju	Chowdapur	[illegible]
87	B. [illegible]	Sulabhpur	[illegible]
88	N. Venkaiah	Lakshmidevipally	[illegible]
89	K. Anjaiah	[illegible]	[illegible]
90	G. Narsimlu	[illegible]	[illegible]
91	G. Anjaiah	[illegible]	[illegible]
92	K. Malaiah	[illegible]	[illegible]

93	K. Venkaiah (V)	Lanmidevipally	
94	K. Srinivas (V)	Lanmidevipally	
95	A Prema	Lanmidevipally	
96	J. Venkat Ram Reddy	Bheemaram	
97	do	Bheemaram	
98	K. Ramulu (V)	Lanmidevipally	
99	L. [illegible]	Meenakshi Nagar	
100	M. Srinivas	Chandanvelly	
101	P. Manikyam	Mittakodur	
102	B. Nagaraju	Autkoor	
103	Rajanna	Kesamsamudram	
104	G. Ramulu	Lanmidevipally	
105	D. Narsimlu	Ainapur	
106	R. Mallesh	Inapoor	
107	G. Andre Baudh	Chandanvelly	
108	Mallesh	Mittakodur	
109	[illegible]	Erlavagutandla	
110	G. Chennaiah	Chityal	
111	Anand [illegible]	Kandakatla	
112	B. Vijay Kumar Reddy	Bhongir	
113	P. Govind Naik	Dirsanapally	
114	V. Suvarna	Parigi	
115	J. Parvathi	Quthbullapur	
116	CH. Shekar	Quthbullapur	
117	[illegible]	[illegible]	
118	[illegible]	Kulkacherla	
119	[illegible]	[illegible]	
120	[illegible]		
121	S. [illegible]	Kulsekharam	

సంఖ్య	పేరు	ఊరిపేరు	సంతకం
122	Jayaram	Pudur	
123	Srinivas	Peerampally	
124	Madhu	Ippatpally	
125	[illegible]	[illegible]	
126	V. Ramchandhyanayak	Chowdapur	
127	K. vinod Kam	Kulapalli	
128	Anwar Ali	Kaukal	
129	[illegible]	[illegible]	
130	K mallesham	Mandapally	
131	[illegible]	Pasra	
132	[illegible]	[illegible]	
133	K. Ravinder	[illegible]	
134	A. Ramulu	[illegible]	
135	P Chandy	CHELLAPUR	
136	M. [illegible]	[illegible]	
137	P. [illegible]	[illegible]	
138	A. [illegible]	[illegible]	
139	N. Sankar	[illegible]	
140	[illegible]	[illegible]	
141	M. Srinivas	[illegible]	M. Srinivas
142	[illegible]	[illegible]	
143	B. N[illegible]	Kaukal	B. N[illegible]
144	M. R[illegible]	[illegible]	
145	D. Ramakrishna	Bati Reddy	
146	M. [illegible]	[illegible]	
147	K. Anil	Pargi	
148	B Madhusudhan Reddy	Polkurthi	

క్రమసంఖ్య	పేరు	ఊరు	సంతకం
149	[illegible]	Bompally	
150	Sher Khan	[illegible]	
151	[illegible]	[illegible]	
152	[illegible]	[illegible]	
153	P. Srinivas Reddy	Bodempally	
154	E. [illegible]	Bodempally	
155	MD. [illegible]	"	
156	B. [illegible]	"	
157	[illegible]	[illegible]	
158	[illegible]	"	
159.	M. Srinivas	[illegible]	Srinivas
160	C. Anjaiah	Bomreddy Pally	Anjaiah
161	M. Chandraiah	Bomireddypally & other Kamati Addy	
162	B. [illegible]	[illegible]	
163	B.W.	MRI Pvder Hardel.	
164	P. [illegible]	[illegible]	P Nagaraju
165	[illegible]	[illegible]	
166	[illegible] M. Srikanth	[illegible]	
	D. Krishna	[illegible]	
167	[illegible]	[illegible]	
168	V. Varaha	Mangampally	
169.	C. Sadanandam	Kandelpally	
170	[illegible]	[illegible]	

పర్యావరణ ప్రజాభిప్రాయ సేకరణ

కొలి పారిశుద్ధ్య మరియు ఘన వ్యర్థాల నిర్వహణ, ఆలంకాన రాష్ట్రము

ప్రతిపాదిత పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ ప్రాజెక్ట్, నాగర్ కర్నూలు,

[illegible] రాయ రెడ్డి, నారాయణ పేట, వికారాబాద్ మరియు వల్లగొండ జిల్లాలు.

వికారాబాద్ జిల్లా

తేది : 10.08.2021 సమయం : ఉదయం 11.00

ప్రదేశం : పబ్లిక్ మీటింగ్ హాల్, కలెక్టరేట్ కాంప్లెక్స్, మరియు వికారాబాద్ జిల్లా

క్రమసంఖ్య	పేరు & చిరునామా (ఆంగ్లంలో)	పూర్తి చిరునామా	సంతకం (ఆంగ్లంలో)
1.			
2.	G. Nageshu	Raghavapur	
3	C. Yadagiri	Raghavapur	
4.	G. Venkatesh	Vyasapalle	
5.	K. [illegible]	Sayyadpalli	K. [illegible]
6	D. Nagulavan	Bhagyanagar Colony	D. Nagulavan
7.	Venkatesh Rathod	Sayyadpalli	
8	D. [illegible]	Kulkuda	
9.	P. [illegible]	Chellapur	
10	M. Naga Raju	Mandal Kilari	
11	A. Srikanth Reddy	Gurrumpally	A. Srikanth
12	B. Venkatesh	Chigurupally	
13	P. [illegible]		
14	E. [illegible]	Syed Pally	
15	T. [illegible]	[illegible]	T. [illegible]
16	[illegible]	[illegible]	[illegible]
17	G. MALLESH	Sayyadpalli	G. Mallesh
18	Md. Tajuddin	Chigurupally	Tajuddin
19	R. Srinivas	Rukkumpally	
20	P. Venkat Ram Reddy	Sulthanpur	
21	Mallesh	Inapur	
22	[illegible]	[illegible]	[illegible]
23	B. Venkatesh	Nasker	B. [illegible]
24	[illegible]	[illegible]	
25	[illegible]	[illegible]	

క్రమసంఖ్య	పేరు & హోదా/పేరు	ఊరు/వివరం	సంతకం
26	K. పాపమ్మ	పస్రా	K. పాపమ్మ
27	M. Rajasheker	municipal	
28	B. VENKAT Ramy	Parsi	
29	E. Anjaneyulu	Mothabally	
30	P. వెంకట్ రెడ్డి	చెల్పూర్	
31	M. Satya [illegible]	M.P.P	
32	G. Narsimulu	Kalakcherla TRS Party	
33	B. Sayanna.	Chegurtypally.	B. Sayanna
34	[illegible]	Chegurtypally.	
35.			
36	R. సక్కులు.	వల్లంకొండ	
37	Md. Khatunbi	పెద్దపల్లి	
38	B. Anand	మానేరు వాగు	
39	E. Srinivas.	Khudawandpur.	
40	B. మల్లేష్	పూర్వ సింధుపల్లి	
41	J. SRISAILAM	parsi	
42	పంతులు	కేలలు	
43	K. Balaiah	24) మంథని	
44	P. Pavithra	పల్లెకుదురు	పవిత్ర
45	G. Darlan Kumar	కాటాపూర్	Darlan
46	B. Prabhakar	Changorou	B. Prabhakar
47	K. లక్ష్మీనారాయణ	లంబాడిపల్లి	K. లక్ష్మీనారాయణ
48	M. డి. మీనా	చిన్నారావుపేట	M. Meena
49	P. Manipalreddy	Kamanpally	P. Manipalreddy
50	D. Ramchandar	Budharam	D. Ramchandar
51			
52	NHARIKRISHNA REDDY	M.M.P.I	N.H.Reddy
53	K Laxmi	Parkal	K. Laxmi
54	D. Anitha.	పరిగి.	D. Anitha.
55			
56	P. పద్మావతి	పరిగి	P. పద్మావతి
57	M. కళావతి	మహదేవ్	M. కళావతి

58	Ramulu Laxmi Jeripally	
59		
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క్రమసంఖ్య	పేరు మరియు పూర్తి పేరు		సంతకం
90	P. Venkanna	Vacancy	
91	G. Srikanth	Yenkapally	
92	కిరణ్ కుమార్	మన్నెగూడ	
93	యాదమ్మ	మంచిర్	
94	[illegible]	మంచిర్	
95	N. Santhosha	మంచిర్	N. Santhosha
96	B [illegible]	మంచిర్	B [illegible]
97	[illegible]	[illegible]	
98	P. Nagaraju	Rapaka	
99	C. Narasimha	padmavanam	
100	Y. Mallesham	Mittakodur	
101	MD Nawaz Pasha	Kesavally	
102	K. Mallesham	ముస్తాబాద్	
103	N. Venkanna	Vithoba	
104	N. Yadagiri	Nagaram	
105	Malla	patel	
106	E. Mahesh	Bommedy pally	
107	D. Buggaiah	"	
108	పేర్లు రాయకపోవడం		
109			
110	K. Venkateshwarlu గౌడ్	Singapur	
111	[illegible]		
112	Kodeeram కాపరి		
113			
114	SYed Rhii Patel	SYed malkapur	
115	Mohd. Riyaz	Colliery	
116	C. Balakishan	Kanpka Palli	
117	[illegible]	[illegible]	
118	[illegible]	[illegible]	
119	S.R. WARRANT	[illegible]	
120			
121			
122			

Minutes of Meeting-Public Hearing

Vikarabad

ప్రజాభిప్రాయసేకరణ యొక్క సమావేశ అంశాలు

తెలంగాణ రాష్ట్ర ప్రభుత్వ నీటిపారుదల శాఖ వారు ప్రతిపాదించిన పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీం (PRLIS), దశ -II కి సంబంధించి 10-08-2021 నాడు, ఉదయం 11.00 గంటలకు బృందావన్ గార్డెన్, కొడంగల్ రోడ్, పరిగి, వికారాబాద్ జిల్లా వద్ద నిర్వహింపబడిన పర్యావరణ ప్రజాభిప్రాయసేకరణ యొక్క సమావేశ అంశాలు.

పర్యావరణ ప్రజాభిప్రాయసేకరణ సమావేశానికి హాజరయిన ప్యానెల్ సభ్యులు :

వ. సం	ప్యానెల్ సభ్యుల పేరు	హోదా
1.	శ్రీమతి. పాసుమి టసు, ఐ.ఎ.ఎస.	జిల్లా కలెక్టర్ మరియు జిల్లా మెజిస్ట్రేట్, వికారాబాద్ జిల్లా
2.	శ్రీ పి. సుధేష్ బాబు	పర్యావరణ ఇంజినీర్, తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి, ప్రాంతీయ కార్యాలయం-I, సంగారెడ్డి.

ఈ సమావేశంలో పాల్గొన్న నీటిపారుదల శాఖ అధికారులు మరియు ఇతర అధికారులు:

వ.సం	హాజరయిన సభ్యులు మరియు హోదా
1.	శ్రీ కె. శ్రీనివాస్, ఎస్ ఇ, నీటిపారుదల శాఖ, మహబూబ్ నగర్.
2.	శ్రీ ఎస్. మోతిలాల్, అదనపు జిల్లా కలెక్టర్ మరియు అదనపు జిల్లా మెజిస్ట్రేట్, వికారాబాద్ జిల్లా
3.	శ్రీ కే. వి. ఉపేందర్ రెడ్డి, ఆర్.డి ఓ, వికారాబాద్

పర్యావరణ ఇంజినీర్, ప్రాంతీయ కార్యాలయం, తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి, సంగారెడ్డి వారు, తెలంగాణ రాష్ట్ర ప్రభుత్వ నీటిపారుదల శాఖ వారు ప్రతిపాదించిన పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీం (PRLIS), దశ -II కి సంబంధించి బృందావన్ గార్డెన్, కొడంగల్ రోడ్, పరిగి, వికారాబాద్ జిల్లా వద్ద నిర్వహించిన పర్యావరణ ప్రజాభిప్రాయసేకరణ కార్యక్రమంలో పాల్గొన్న ప్రజలను, ప్రజా ప్రతినిధులను, ఇతర అధికారులను ఆహ్వానించారు. వికారాబాద్ జిల్లా కలెక్టర్ గారిని వేదిక పైకి ఆహ్వానిస్తూ, పర్యావరణ ప్రజాభిప్రాయ సేకరణ కార్యక్రమాన్ని భారత ప్రభుత్వంచే జారీ చేయబడిన పర్యావరణ ప్రభావ అధ్యయనము (ఇ.ఐ.ఎ) నోటిఫికేషన్, 2006 S.O.(E) నం. 1533, తేది

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14-09-2006 లో ఏర్కొన్న విదానానికి అనుగుణంగా కార్యక్రమాన్నినడిపించమని కోరారు. పర్యావరణ ప్రభావాల అధ్యయనము (ఇ.ఐ.ఎ) నోటిఫికేషన్ 2006 మరియు నోటిఫికేషన్ యొక్క తదుపరి సవరణలలోని ముఖ్యమైన అంశాలను అందరికీ వివరిస్తూ నోటిఫికేషన్ ప్రకారం పర్యావరణ ప్రజాభిప్రాయ సేకరణ అనేది ఒక తప్పనిసరి ప్రక్రియ అని ఏర్కొన్నారు. పర్యావరణ ప్రజాభిప్రాయ సేకరణ యొక్క సమాదారం 10-07-2021 నాడు 'సమస్త తెలంగాణ' (తెలుగు దినపత్రిక) మరియు ' తెలంగాణ టుడే' (ఆంగ్ల దినపత్రిక) లలో ప్రచురించబడిందని ఏర్కొన్నారు. ఈ ప్రాజెక్టు యొక్క ముసాయిదా పర్యావరణ ప్రభావాల అధ్యయనము నివేదిక మరియు తెలుగు, ఇంగ్లీషు బాషల్లో కార్యనిర్వహణ సారాంశమునకు సంబందించిన నివేదికలను స్థానిక గ్రామ కార్యాలయాలలో మరియు జిల్లా కలెక్టర్ కార్యాలయం వద్ద ప్రజల సౌకర్యార్థం ప్రదర్శించబడింది. ఈ పర్యావరణ ప్రజాభిప్రాయ సేకరణ కార్యక్రమము ప్రతిపాదిత ప్రాజెక్టు పై అభిప్రాయాలు, సూచనలు, అభ్యంతరాలు ఏమైనా ఉంటే వాటిని తెలుసుకొనుటకు నిర్వహించబడుతుంది. మొత్తం కార్యక్రమాన్ని చిత్రికరించి, తదుపరి చర్యలు తీసుకోవడం కొరకు అధికారులకు పంపబడుతుంది. ఈ ప్రతిపాదనపై తుది తీర్పును ఈ కార్యక్రమంలో తీసుకోలేమని అయన తెలియజేశారు. అనంతరం వికారాబాద్ జిల్లా కలెక్టర్ గారిని సభను నిర్వహించవలసిందిగా కోరారు.

జిల్లా కలెక్టర్ మరియు జిల్లా మెజిస్ట్రేట్, వికారాబాద్ జిల్లా: జిల్లా కలెక్టర్ & జిల్లా మెజిస్ట్రేట్ వారు మాట్లాడుతూ, పర్యావరణ ప్రజాభిప్రాయ సేకరణ కార్యక్షమంలో పాల్గొన్న ప్రజలను మరియు అధికారులను ఆహ్వానిస్తూ, వేదిక వద్ద గుమిగూడిన వ్యక్తులను, సమావేశ నియమాలను పాటించమని అభ్యర్థించారు. పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీం (PRLIS) కి సంబంధించి పర్యావరణ అనుమతులు పొందడానికి ప్రజాభిప్రాయ సేకరణ తప్పనిసరి ప్రక్రియ అని ఆమె ఏర్కొన్నారు. ప్రతిపాదిత ప్రాజెక్ట్ గురించి ప్రజలు తమ అభిప్రాయాలు, సూచనలు మరియు అభ్యంతరాలను స్వేచ్ఛగా చెప్పవచ్చు అని ఆమె ఏర్కొన్నారు. తమ అభిప్రాయాన్ని చెప్పాలని అనుకునే వారు తమ పేరు మరియు గ్రామము పేరు పేపర్ స్లిప్ పై రాసి పంపమని కోరారు. అలాగే వ్రాతపూర్వక ప్రాతినిధ్యం కూడా అందించవచ్చు అని తెలిపారు. సమయాన్ని తగు విధముగా ఉపయోగించుకోవాలని ఆమె ప్రజలను అభ్యర్థించారు మరియు పర్యావరణ బహిరంగ విచారణ మొత్తం వీడియో గ్రాఫింగ్ చేయబడుతుందని ఏర్కొన్నారు. అనంతరం ప్రతిపాదిత ప్రాజెక్టు ముఖ్యాంశాలను వివరించాలని నీటిపారుదల శాఖ, ఎస్.ఈ. గారిని మరియు పర్యావరణ కన్సల్టెంట్ ప్రతినిది గారిని డ్రాఫ్ట్ EIA నివేదికపై వివరించాలని కోరారు.

శ్రీ శ. శ్రీనివాస్, ఎస్ ఇ. నీటిపారుదల శాఖ, మహబూబ్ నగర్.: సమావేశానికి విచ్చేసిన ప్రజా ప్రతినిధులను, జిల్లా కలెక్టర్ గారిని, ఇతర అధికారులు మరియు ప్రజలను సమావేశానికి ఆహ్వానిస్తూ,

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తెలంగాణ రాష్ట్ర ప్రభుత్వ నీటిపారుదల శాఖ వారు ప్రతిపాదించిన పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీం (PRLIS) గురించి ఈ విధముగా వివరించారు.

- పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ స్కీం, అధిక నీటి కొరత ఉన్న ఎగువ మరియు కరువు ప్రాంతాలైన ఐదు జిల్లాలు మహబూబ్ నగర్, నాగర్ కర్నూల్, రంగారెడ్డి, వికారాబాద్, నారాయణపేట మరియు నల్గొండ ప్రాంతాలకు స్వల్పమైన త్రాగునీటిని సరఫరా చేయడానికి ఉద్దేశించబడింది.

- పైన పేర్కొన్న జిల్లాలలో మొత్తం చెరువుల ప్రాంతాలతో పోలిస్తే, సాగు చేయదగిన ప్రాంతాల శాతం తక్కువగా ఉంటుంది.

- ఈ సమస్యను అధిగమించడానికి, ప్రభుత్వం 90 టీఎంసీల నీటిని కృష్ణానదిపై ఉన్న శ్రీశైలం రిజర్వాయర్ ముందుభాగం నుండి వరద కాలువలు ప్రవహించే సమయములో 60 రోజులలో 5 దశలుగా మరియు 6 రిజర్వాయర్ల ద్వారా 6 జిల్లాలలో, 70 మండలాలలో, 1226 గ్రామాలలో త్రాగు నీరు, పరిశ్రమల అవసరాలను తీర్చడం తో పాటుగా 12,30,000 ఎకరాల భూమికి సాగునీరు అందించాలని ప్రతిపాదించింది.

- ఈ ప్రాజెక్ట్ రెండు దశల్లో చేపట్టబడుతుంది. తాగునీటి కోసం 1 వ దశ మరియు 2 వ దశలో సాగు నీరు మరియు పారిశ్రామిక అవసరాలు ఉంటాయి.

- ఈ ప్రాజెక్ట్ వికారాబాద్ జిల్లాలోని 18 మండలాల యొక్క 417 గ్రామాలకు విస్తరించి ఉంటది. ఉదండపూర్ మరియు K.P లక్ష్మీదివిపల్లి రిజర్వాయర్ల నుండి నీరు సరఫరా చేయబడుతుంది.

- ఉదండాపూర్ రిజర్వాయర్ నుండి 2,44,410 ఎకరాల భూమికి మరియు K. P. లక్ష్మీదివిపల్లి రిజర్వాయర్ నుండి 97,542 ఎకరాలకు నీటిని సరఫరా చేయబడుతుంది. ఆయకట్టు కాలువల నిర్మాణం కోసం సేకరించాల్సిన భూమి సుమారు 9830 ఎకరాలు.

- ఈ ప్రాజెక్ట్ పూర్తయిన తర్వాత భూగర్భ జలాలు మెరుగుపడతాయి, సాగు విస్తీర్ణంలో పెరుగుదల, ప్రజల సామాజిక-ఆర్థిక పరిస్థితులు మెరుగుపడతాయి, పంటల పంపకం వృద్ధి చెందుతుంది, పశుసంవర్ధకంలో పాల ఉత్పాదకత మెరుగుపడతాయి, మౌలిక సదుపాయాల మెరుగుదల, మెరుగైన వినోదం మరియు పర్యాటక రంగాల అభివృద్ధి జరుగుతుంది.

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ప్రాజెక్ట్ బ్యాక్‌గ్రౌండ్:

- భారతదేశంలోని దక్షిణ భాగంలో ఉన్న తెలంగాణ, భారతదేశ 29 వ రాష్ట్రం, తేదీ 2, జూన్ 2014 న ఆవిర్భవించబడినది. తెలంగాణ రాష్ట్రం 1,12,077 చ. కి.మీ. విస్తీర్ణం కలిగి, 35 మిలియన్లకు పైగా ఉనాడా, 24% విస్తీర్ణంలో అడవులు మరియు 43% సాగు భూమిని కలిగి ఉంది.

- 75% భూమి భూగర్భజలాల ద్వారా మరియు కివలము 25% ఉపరితల నీటి సరఫరా ద్వారా సాగు చేయబడుతున్నాయి.

- రాష్ట్రం యొక్క డ్రైనేజీని 2 ప్రధాన మరియు 11 ఉప-బేసిన్‌లుగా విభజించవచ్చు. రాష్ట్రంలోని ప్రధాన నదులు గోదావరి మరియు కృష్ణా. రాష్ట్ర భూభాగంలో దాదాపు 73.5% ఈ రెండు నదుల బేసిన్‌లో ఉన్నాయి, అయితే, ప్రతిపాదిత నీటిపారుదల ప్రాజెక్ట్ కృష్ణా నది పరీవాహక ప్రాంతాన్ని కవర్ చేస్తుంది.

- వ్యవసాయ-వాతావరణ మండలాల ప్రకారం, ఈ ప్రాంతం దక్షిణ పీఠభూమి మరియు కొండ ప్రాంతాల కిందకు వస్తుంది మరియు హాట్ సెమి-ఎరిడ్ ఎకో-రీజియన్‌గా వర్గీకరించబడింది.

- 2015-16 వ్యవసాయ గణాంకాల ప్రకారము నల్గొండ, మహబూబ్‌నగర్ మరియు రంగారెడ్డి జిల్లాలు తెలంగాణాలో కరువుకు గురి అయ్యాయని, ఇవి హైదరాబాద్ ప్రభావిత ప్రాంతాలు కాబట్టి తాగునీటికి విపరీతమైన కొరత ఏర్పడిందని సూచించబడ్డాయి.

- ఈ పరిస్థితిని చక్కదిద్దడానికి, తెలంగాణ ప్రభుత్వం పాలమూరు రంగారెడ్డి లిఫ్ట్ ఇరిగేషన్ పథకాన్ని చేపట్టింది, ఈ కరువు పీడిత ప్రాంతాల దుస్థితిని తొలగించడానికి 6 జిల్లాల్లోని 70 మండలాలకు 1226 గ్రామాలతో పాటు 50 లక్షల మంది ప్రజలు సురక్షితమైన తాగునీటితో ప్రయోజనం పొందుతారు.

- టర్మ్స్ ఆఫ్ రిఫరెన్స్ (TOR) నం. J-12011/31/2017-IA-I (R), తేదీ 11.10.2017 రోజున ఇవ్వడము జరిగినది మరియు 10 అక్టోబర్, 2021 వరకు చెల్లిడిటీ కలిగి ఉన్నది.

- Voyants Solutions Pvt. లిమిటెడ్ ప్రాజెక్ట్ ప్రతిపాదకుడు, గురుగ్రామ్ వారు, EIA-EMP అధ్యయనాల పనిని ఆన్‌లైన్ టెండరింగ్ ప్రక్రియ ద్వారా అధ్యయనాలు నిర్వహించడం కోసం PRLIS, ఇరిగేషన్ మరియు CAD డిపార్ట్‌మెంట్, తెలంగాణ రాష్ట్ర ప్రభుత్వం, CE ద్వారా అనుమతించింది.

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- ఇంతకు ముందు బేసలైన్ మానిటరింగ్ 2017 సంవత్సరములో మాన్సూన్ & పోస్ట్ మాన్ సూన్ సమయములలో మరియు 2018 సంవత్సరములో మాన్సూన్ సమయములో, నిర్వహించబడింది. మునుపటి పబ్లిక్ హియరింగ్ అనుకోని కారణాల వల్ల వాయిదా వేయబడింది.

- EIA నోటిఫికేషనుకి, 14 సెప్టెంబర్, 2006 లోని, పారా 7 (i) మరియు అనుబంధం-IV లోని పేరా 2.2 ప్రకారం, ప్రాజెక్టు ప్రతినిధి, ఎగ్జిక్యూటివ్ సారాంశంతో పాటు డ్రాఫ్ట్ EIA-EMP నివేదికను తెలంగాణా కాలుష్య నియంత్రణ మండలి కి సమర్పించారు.

- మళ్లి ప్రాజెక్ట్ బేసలైన్ మానిటరింగ్ ప్రక్రియ మరియు అధ్యయన ప్రక్రియ 2019 సంవత్సరములో మాన్సూన్ సమయములో మరియు మాన్సూన్ సమయము తరువాత మరియు 2020 సంవత్సరములో మాన్సూన్ సమయమునకు ముందు చేశారు. పబ్లిక్ హియరింగ్ ప్రక్రియ 10 ఆగస్టు, 2021 రోజున జరుపుటకు షెడ్యూల్ చేయబడింది.

- ఈ ప్రాజెక్ట్ పర్యావరణ సలహాదారు M/s. వేయంట్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్, వారు QCI-NABET నుండి అక్రిడిటేషన్ కలిగి ఉన్నారు.

- ఈ ప్రాజెక్ట్ 2 దశలను కలిగి ఉంది; దశ - I (Phase –I): తాగునీటి సరఫరా దశ – II (Phase – II): నీటిపారుదల.

- ఈ ప్రాజెక్ట్ కి నీటి వనరు శ్రీశైలం జలాశయం ముందు భాగం నుండి వర్షాకాలంలో వచ్చే అధిక వరద నీరు.

- మహబూబ్ నగర్, నాగర్ కర్నూల్, నల్గొండ, నారాయణపేట, వికారాబాద్, రంగారెడ్డి జిల్లా లకు మరియు హైదరాబాద్ నగరానికి తాగు నీరు సరఫరా చేయబడుతుంది.

- నీటిపారుదల, 6 జిల్లాలు (మహబూబ్ నగర్, నాగర్ కర్నూల్, నల్గొండ, నారాయణపేట, వికారాబాద్, రంగారెడ్డి), 70 మండలాలు, 1226 గ్రామాలలో, 915.47 కి.మీ లతో, 4,97,976 హెక్టారుల విస్తీర్ణానికి చేయబడుతుంది.

- అంజనగిరి, వీరాంజనేయ, వెంకటాద్రి, కురుమూర్తిరాయ, ఉదండాపూర్ మరియు లక్ష్మీదేవిపల్లిలోని 6 బ్యాలెన్సింగ్ రిజర్వాయర్ల నుండి, 5 దశల ఎత్తిపోతలు మరియు తరువాత గురుత్వాకర్షణ ప్రవాహం ద్వారా నీటిని వినియోగించబడుతుంది.

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- ఈ ప్రాజెక్ట్ నీటి నిల్వ సామర్థ్యం 90 TMC లు (నీటిపారుదల కొరకు 82.52 TMC, తాగునీటి సరఫరా కోసం 7.15 TMC మరియు పారిశ్రామిక ఉపయోగం కోసం 0.33 TMC) ప్రాజక్ట్ బడ్జెట్ రూ. 52,056.31 కోట్లు మరియు BC నిష్పత్తి 1.25: 1.

- వివిధ రిజర్వాయర్లను చూపించే ప్రాజెక్ట్ యొక్క స్కీమాటిక్ రేఖా చిత్రాన్ని చూపించారు. శ్రీశైలం జలాశయం ముంపుభాగం అయిన 244.4 మీటర్ల స్థాయిలో నుండి 670 మీటర్ల స్థాయి వరకు వరుస క్రమములో అమర్చిన పంపింగ్ స్టేషన్ల ద్వారా నీటిని నార్లాపూర్ నుండి ఏదుల - వట్టెమ్ - తర్వాడ నుండి ఉదండాపూర్ - కె. పి. లక్ష్మీదేవిపల్లి వరకు పంపింగ్ చేయుట గురించి.

- ప్రాజెక్ట్ యొక్క 6 జలాశయాల నుండి మొత్తం 13 కాలువలు మరియు 917 KM రోడ్డు మరియు ఆయకట్టు 4,96,976 హెక్టార్లు.

- వికారాబాద్ జిల్లాలో మండలాల వారిగా ఆయకట్టు వివరాలు ఇలా ఉన్నాయి:

  బోస్రాసుపేట్ (గ్రామాలు: 25 & ఆయకట్టు: 30587), కోడంగల్ (గ్రామాలు: 13 & ఆయకట్టు: 21524), దౌల్తాబాద్ (గ్రామాలు: 16 & ఆయకట్టు: 11640), దోమ (గ్రామాలు: 26 & ఆయకట్టు: 16643), కుల్కచెర్ల (గ్రామాలు: 13 & ఆయకట్టు: 9005), పరిగి (గ్రామాలు: 29 & ఆయకట్టు: 20137), పూడూర్ (గ్రామాలు: 23 & ఆయకట్టు: 17095), ధరూర్ (గ్రామాలు: 34 & ఆయకట్టు: 24834), కోటపల్లి (గ్రామాలు: 18 & ఆయకట్టు: 14211), బంట్వారం (గ్రామాలు: 10 & ఆయకట్టు: 6177), వికారాబాద్ (గ్రామాలు: 31 & ఆయకట్టు: 16656), మోమిన్‌పేట్ (గ్రామాలు: 21 & ఆయకట్టు: 20851), మర్పల్లి (గ్రామాలు: 25 & ఆయకట్టు: 16468), ఐపీరాబాద్ (గ్రామాలు: 30 & ఆయకట్టు: 34669), పెద్దేముల్ (గ్రామాలు: 17 & ఆయకట్టు: 12534), యాలాల్ (గ్రామాలు: 32 & ఆయకట్టు: 26432), తాండూర్ (గ్రామాలు: 34 & ఆయకట్టు: 24837), నవాబ్‌పేట్ (గ్రామాలు: 20 & ఆయకట్టు: 17652); కవర్ చేయబడిన మొత్తం మండలాల సంఖ్య 18; మొత్తం గ్రామాల సంఖ్య 417; వికారాబాద్ జిల్లాలో ఎకరాలలో ఆయకట్టు మొత్తం వైశాల్యం 3,41,952.

శ్రీ గాంటి బందోపాధ్యాయ, ప్రతినిధి, M/s. వేయంక్స్ సొల్యూషన్స్ ప్రైవేట్ లిమిటెడ్, మ్యాడ్‌ఫ్లీ (ఎన్విరాన్‌మెంటల్ కన్సల్టెంట్): సాంప్రదాయ సభావందన ప్రసంగం అనంతరం, అతను పర్యావరణ అంచనా ప్రభావాలు, పారామీటర్స్ మరియు ఉపశమన చర్యలతో కూడిన పర్యావరణ వివరాలను క్లుప్తంగా వివరించారు.

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- ప్రాజెక్టి ప్రాంతంలో 6 ప్రదేశాలలో, 2019 సంవత్సరములో, మాన్సూన్ కాలము మరియు పోస్ట్ మాన్సూన్ కాలములలో అనంతరము 2020 సంవత్సరములో ప్రీ మాన్సూన్ కాలములలో బేసలైన్ అధ్యయనాలు జరిగాయి.

- పరిసర గాలి నాణ్యత, పరిసర ధ్వని నాణ్యత, నేల నాణ్యత, భూగర్భ జల నాణ్యత మరియు ఉపరితల నీటి నాణ్యత లను పర్యవేక్షించడము జరిగినది.

- సూక్ష్మ వాతావరణం: నిర్మాణ దశలో, నిర్మాణ పనుల కారణంగా ఉష్ణోగ్రత మరియు తేమపై స్వల్పకాలిక ప్రభావం ఉన్నను ఆపరేషన్ దశలో ఎలాంటి ప్రభావం ఉండదు. నిర్మాణ ప్రక్రియ నియంత్రిత పద్ధతిలో జరుగుతుంది.

- భూ వినియోగం: వ్యవసాయ/వ్యవసాయేతర భూమి శాశ్వతంగా నీటి వనరుగా మార్చబడుతుంది. మిగులైన మరియు ప్రణాళికాబద్ధమైన భూ వినియోగ అభివృద్ధి ప్రణాళిక ద్వారా ప్రభావం తగ్గిస్తుంది.

- నేల నాణ్యత: బ్లాస్టింగ్ మరియు త్రవ్వకము జరిగేప్పుడు నేల కోతపై మధ్యస్థ ప్రభావం ఉంటుంది, నిర్మాణ సమయంలో మరియు కార్యాచరణ దశలో పెద్ద ప్రభావం ఉండదు. ఉపశమన పద్ధతిలో భాగంగా త్రవ్వి తీసిన మట్టిని బండింగ్ మరియు గ్రీన్ బెల్ట్ అభివృద్ధి కోసం ఉపయోగిస్తారు.

- వాయు వాతావరణం: నిర్మాణ దశలో మామూలు మోతాదు నుండి అధిక ధూళి కాలుష్యానికి అవకాశం ఉంది మరియు ఆపరేషన్ దశలో పెద్దగా ప్రభావం ఉండదు. క్రమ పద్ధతిలో కాలుష్య పర్యవేక్షణ చేస్తూ రోడ్ల నిర్వహణతో కాలుష్య నియంత్రిత కార్యకలాపాలను చేపట్టాలని సూచించారు.

- శబ్దం వలన ప్రభావాలు: నిర్మాణ సమయంలో మామూలు మోతాదు నుండి అధిక శబ్ద కాలుష్యం వచ్చే అవకాశం, అయితే కార్యాచరణ దశలో పెద్దగా ఎలాంటి ప్రభావాలు ఉండక పోవొచ్చు. శబ్ద అవరోధంగా పనిచేయడానికి బహుళ వరుసలలో చెట్లను పెంచాలని సూచించబడింది.

- బ్లాస్టింగ్ వల్ల ప్రభావాలు: పేలుడు కారణంగా గాలి పీడనం పెరుగుతుంది మరియు ఊహించినటువంటి శబ్దం 103.2 -109.8 dB (A) పరిధిలో ఉంటుంది మరియు అవి నిర్దేశించిన పరిధి 120 dB (A) లో ఉంటాయి. జియోలాజికల్ ప్లానింగ్ మరియు బ్లాస్టింగ్ ప్రకారం నియంత్రిత మరియు ప్రణాళికాబద్ధమైన బ్లాస్టింగ్ చేయబడుతుంది. సెటిల్మెంట్లు మరియు ఆవాసాలకు 300 మీటర్ల పరిధిలో బ్లాస్టింగ్ చేపట్టబడదు. ఏదైనా ప్రతికూల ప్రభావాన్ని తగ్గించడానికి

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టన్నలింగ్ మరియు ఇతర ప్రధాన పనులను చేపట్టడానికి ఆమోదించబడిన బ్లాస్టింగ్ ప్రణాళికను అనుసరించాలని సూచించబడింది.

- నీటి పర్యావరణం: నది నీటిలో ఘన మరియు సిల్ట్ గాఢత పెరిగే అవకాశం ఉంది. భూభాగం మరియు దాని భౌగోళిక పరిస్థితుల కారణంగా కొన్ని పాకెట్స్ లో నీరు ఆగే అవకాశం ఉంది. ఉపశమన చర్యగా కాలువ వ్యవస్థలో నియంత్రిత త్రవ్వకాలను చేపట్టాలని మరియు వర్షాకాలంలో నీటి నిరోధాన్ని నివారించడానికి నిర్బంధిత తవ్వకాలను చేపట్టాలని సూచించారు.

- భూగర్భ శాస్త్రం: స్థానికంగా తక్కువ ప్రభావాలు మాత్రమే జరుగ వచ్చు. ప్రాంతం యొక్క భౌగోళిక స్థితి ప్రకారం నియంత్రిత మరియు ప్రణాళికాబద్ధమైన బ్లాస్టింగ్ చేపట్టాలని సూచించబడింది.

- హైడ్రాలజీ: భూగర్భ జలాల రీచార్జ్ 970.24 MCM వరకు ఉంటుంది. కొన్ని ప్రాంతాలలో నియంత్రణలో లేకుండా ప్రమాదవశాత్తు కాలువల్లోకి విడుదల అయ్యే సీపేజ్‌ని నివారించడానికి క్రమం తప్పకుండా పర్యవేక్షించాలని సూచించారు.

- వృక్షజాలం: ప్రాజెక్ట్ ప్రాంతం పరిసరాల్లో పొని కలిగించే లేదా అంతరించిపోతున్న జాతులు లేవు. కాలువ గట్లు మరియు మొత్తం కాలువ నెట్‌వర్క్ ప్రాంతం కూడలి వెంబడి బహుళ వరుసలలో చెట్లను పెంచాలని సూచించబడింది. నిర్మాణ దశలో, అటవీ ప్రాంతాల్లో వెలికితీత పనుల సమయములో కోల్పోయే చెట్లకు బదులుగా పరిహారంగా అడవుల పెంపకాన్ని చేపట్టాలి.

- జంతుజాలం: ప్రాజెక్ట్ నిర్మాణం కారణంగా అంతరించిపోతున్న మరియు ప్రమాదంలో ఉన్న జాతుల ప్రస్తుత ఆవాసాలలో ఎటువంటి మార్పు లేనందున, ఏదైనా, అటవీ ప్రాంతాల యొక్క సహజ సిట్టింగ్‌కు భంగం కలగకుండా ఉండేందుకు అటవీ ప్రాంతాల సమీపంలో నియంత్రిత నిర్మాణాన్ని చేపట్టాలని సూచించబడింది.

- సామాజిక-ఆర్థిక పరిస్థితి: నీటిపారుదల వలన ఆదాయ స్థాయిలలో మెరుగుదల మరియు సాధారణ నీటి సరఫరా వలన పంట తీవ్రత ఉంటుంది. ప్రాజెక్ట్ ప్రాంతం యొక్క సామాజిక-ఆర్థిక స్థితిని మెరుగుపరుస్తుంది మరియు ప్రజలు స్థిరమైన మరియు క్రమమైన ఆదాయాన్ని పొందుతారు.

- పర్యావరణ నిర్వహణ ప్రణాళిక: పర్యావరణం మరియు జీవావరణ శాస్త్రం నిర్వహణ కోసం రూ .1744 కోట్లు ఖర్చు చేయాలని ప్రతిపాదించబడింది. ప్రధాన భాగాలు కమాండ్ ఏరియా

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డెవలప్‌మెంట్, రీసెటిమెంట్ మరియు రిహాబిలిటేషన్ ప్లాన్, గ్రీన్ బెల్ట్ డెవలపమెంట్ ప్లాన్, సాలిడ్ వేస్ట్ డిస్పోజల్, ప్రొటెక్టెడ్ ఎన్విరాన్మెంట్ మానిటరింగ్ ఖర్చు రూ .228 లక్షలు.

- భూ సేకరణ: భూమికి పరిహారం RECT LAAR చట్టం 2013 ప్రకారం చెల్లించబడుతుంది. మార్కెట్ విలువను బట్టి పరిహారం చెల్లించబడుతుంది మరియు గ్రామీణ ప్రాంతాల్లో గరిష్టంగా 2 రెట్లు మరియు పట్టణ ప్రాంతాలలో 1 గా.
- సోలాటియం: మార్కెట్ విలువ ఆధారంగా మరియు భూమి విలువకు అనుబంధంగా ఉన్న ఆస్తుల విలువ మరియు మార్కెట్ విలువపై గుణకార కారకం ఆధారంగా సోలాటియం చెల్లించబడుతుంది.
- ప్రాజెక్ట్ ప్రభావిత కుటుంబాల సంఖ్య 3670 మరియు నీటి పారుదల కోసం సేకరించాల్సిన పట్టా భూమి 3978 హెక్టార్లు.
- R & R క్రింద అంచనా వ్యయం Rs. 1566.86 Crs.

జిల్లా కలెక్టర్, వికారాబాద్: నీటిపారుదల శాఖ అధికారులు ప్రాజెక్ట్ యొక్క లక్షణాలను వివరించారు. ప్రజల నుండి స్వీకరించబడిన స్లిప్‌ల ప్రకారం వారి అభిప్రాయాలు, సూచనలు మరియు అభిప్రాయాలను ఒక్కొక్కటిగా అందించాలని ఆమె ప్రజలను అభ్యర్థించింది.

1. **శ్రీ M. సతి రెడ్డి, SE (రిటైర్డ్), నీటిపారుదల మరియు CAD శాఖ:** సాంప్రదాయ సభావందన ప్రసంగం అనంతరం, అతను తన పదవీ విరమణకు ముందు వివిధ సాగునీటి ప్రాజెక్టులపై దాలా కాలం పాటు పనిచేశాడని పేర్కొన్నాడు. ఇప్పుడు అలాంటి సాగునీటి ప్రాంతాలన్నీ సుసంపన్నంగా ఉన్నాయి మరియు ప్రజలు సౌకర్యవంతమైన జీవితాన్ని గడుపుతున్నారని ఆయన పేర్కొన్నారు. ప్రాజెక్టుల నిర్మాణానికి పర్యావరణ అనుమతి తప్పనిసరి అని పేర్కొన్నాడు మరియు ప్రజలకు ప్రయోజనకరంగా ఉండే ప్రాజెక్టకు ముద్దతుగా ప్రజలు తమ అభిప్రాయాలను అందించాలని ఆయన అభ్యర్థించారు. ఈ ప్రాజెక్ట్ నిర్మాణం వల్ల వికారాబాద్ జిల్లా భూములకు నేరుగా సాగునీరు అందించడమే కాకుండా భూగర్భజలాలు పెరగడం వల్ల ప్రయోజనం పొందుతుందని ఆయన పేర్కొన్నారు. ప్రస్తుతం తగినంత విద్యుత్ అందుబాటులో ఉన్నందున, భూగర్భ జలాల లభ్యత పెరగడం వల్ల ఈ ప్రాంత రైతులు పంటలు ఎక్కువ విస్తీర్ణములో పండించే అవకాశం ఉంది. నీరు అధికంగా అవసరం ఉండే వరి పంటకు బదులుగా పూలు, పండ్లు మరియు ఉద్యాన పంటలు వంటి వాణిజ్య పంటల కోసం రైతులు వెళ్లాలని ఆయన సూచించారు. రసాయన

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లేదా ఇతర కాలుష్య కారక పరిశ్రమల వలన వాతావరణం పైన ప్రభావము ఉన్నట్టుగా ఈ ప్రాజెక్ట్ వలన పర్యావరణంపై ఎలాంటి ప్రతికూల ప్రభావం ఉండదని ఆయన అభిప్రాయపడ్డారు.

2. **శ్రీ టి. ప్రవీణ్ కుమార్ రెడ్డి, గ్రా. దిగువదన్నాపూర్:** అతను ఈ ప్రాజెక్టుకు హృదయపూర్వకంగా మద్దతు ఇచ్చాడు మరియు వికారాబాద్ చరిత్రలో ఈ రోజు స్వర్ణ అక్షర దినంగా గుర్తుంచిపోతుందని భావించాడు. ఈ ప్రాజెక్ట్ కోసం ఆకాంక్షిస్తున్న పరిగి ప్రజలకు తాగునీరు అందించినందుకు అధికార యంత్రాంగానికి ఆయన కృతజ్ఞతలు తెలిపారు. నీటిపారుదల మరియు తాగునీటి అవసరాలకు ఈ ప్రాజెక్ట్ నీటిని సరఫరా చేస్తున్నందున, ఈ ప్రాంతం యొక్క సామాజిక-ఆర్థిక అభివృద్ధికి నీరు ముఖ్య అంశం అని ఆయన పేర్కొన్నారు. ఇప్పుడు ఈ ప్రాంతం వర్షాధారంగా ఉంది మరియు నీటి సంపదా విద్యుత్ మరియు మోటార్ల సరఫరాపై ఆధారపడి ఉంటుంది. ప్రాజెక్టును ప్రారంభించిన తర్వాత సమస్య పరిష్కారమవుతుందని ఆయన పేర్కొన్నారు. కాలువ ప్రక్కనే ఉన్న పొలాలకు మోటార్ల ద్వారా నీటిని డ్రా చేయడానికి అనుమతించాలని మరియు గ్రావిటీ ద్వారా నీటిపారుదల చేయలేమని ఆయన అధికారులను అభ్యర్థించారు. ఈ ప్రాంత ప్రజలకు ప్రయోజనం చేకూర్చేందుకు ఈ తరహా ప్రాజక్టును ప్రారంభించినందుకు ఆయన ప్రభుత్వానికి కృతజ్ఞతలు తెలిపారు. అతను భూమిని వదులుకునేవారికి న్యాయం చేయాలని మరియు మార్కెట్ రేటుకు మూడు రెట్లు పరిహారం చెల్లించాలని అధికారులను అభ్యర్థించాడు. భూమి యజమానులకు మాత్రమే పరిహారం చెల్లించబడింది, కానీ 2013 LA చట్టం ప్రకారం భూమిపై ఆధారపడిన వారికి కూడా పరిహారం అందించింది. అతను భూమి లేని కార్మికులు, చిన్న వ్యవసాయదారులు మరియు కౌలుదారులకు ఎకరంలో రూ. 5.0 లక్షల చొప్పున చట్టంలో అందించిన విధంగా పరిహారం పొందాలని కోరాడు. ఎస్సీ, ఎస్టీ రైతులు అసైన్డ్ భూములను సాగు చేస్తున్నారని మరియు ప్రభుత్వం భూములను తిరిగి ప్రారంభిస్తుందని ఆయన భావించారు. తాజా చట్టంలో ఊహించిన విధంగా అసైన్డ్ భూముల విషయంలో పట్టా భూములతో సమానంగా పరిహారం చెల్లించాలని ఆయన అభిప్రాయపడ్డారు. అసైన్డ్ భూములను సాగు చేస్తున్న 30% వ్యక్తులు ఇప్పటివరకు పట్టాదారీ పాసుపుస్తకాలను పొందలేకపోయారని ఆయన పేర్కొన్నారు. ఇతర ప్రాజెక్టుల విషయంలో ఎదురైన సమస్యలను ఆయన లేవనెత్తారు మరియు చట్టపరమైన సమస్యలు పునరావృతం కాకుండా అవసరమైన చర్యలు తీసుకోవాలని అధికారులకు సూచించారు. చివరకు అతను ప్రాజెక్టును ప్రారంభించడానికి ముందు పొందిన చెట్లు మరియు ఇతర ఆస్తులకు తగిన పరిహారాన్ని ఇవ్వాలని అభ్యర్థించాడు.

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3. శ్రీ కె. అరవింద్ రావు, r/o. రంగాపూర్: ప్రాజెక్టుకు తన పూర్తి మద్దతును అందిస్తూ, ప్రతిపాదిత ప్రాజెక్ట్ ద్వారా ప్రతి మండలంలో 20,000-30,000 ఎకరాల భూమిని సాగునీరు అందిందాలని ఆయన ఆశించారు. వికారాబాద్ జిల్లా వర్షాధారంగా ఒకటి పిలుకబడిన జిల్లాగా మిగిలిపోయింది. పాలమూరు జిల్లా యొక్క ఉదాహరణను ఆయన ఉదహరించారు, అక్కడ ప్రజలు తమ భూమికి సాగు నీరు అందించిన తర్వాత సంపన్నంగా మారారు. మున్సూన్ మీద ఆధారపడిన ఈ జిల్లాలో నీరు అందుబాటులో లేనందున ప్రభుత్వ భూములు పెద్ద సంఖ్యలో ఖాళీగా ఉన్నాయని ఆయన పేర్కొన్నారు. గత సంవత్సరం మంచి వర్షాభావం కారణంగా ఈ ప్రాంతంలో రైతులు మంచి పంటను పండించారని ఆయన తెలియజేశారు. ఈ ప్రాజెక్ట్ పూర్తయిన తర్వాత వారు రెండు పంటలు పండించగలరని మరియు బూగర్భజల సమస్యను కూడా పరిష్కరించగలరని ఆయన ఆశించారు. అతను ప్రతిపాదిత ప్రాజెక్టుకు మద్దతు ఇచ్చాడు.

4. శ్రీ ఎం వెంకటయ్య, r/o. పరిగి: లిఫ్ట్ ఇరిగేషన్ ప్రాజెక్టును ప్రతిపాదించినందుకు ప్రభుత్వానికి ఆయన కృతజ్ఞతలు తెలిపారు. ప్రతిపాదిత ప్రాజెక్ట్ కోసం తమకు ఎలాంటి అభ్యంతరం లేదని ఆయన తెలియజేశారు. ఏదేమైనా, భూకంపాల ప్రభావం జలాశయాలపై ఉండని విధంగా రిజర్వాయర్లను నిర్మించాలని ఆయన నీటిపారుదల అధికారులను అభ్యర్థించారు. అనేక ఎకరాల భూమి సాగు చేయబడుతుందని ఆయన తెలియజేశారు. భూ సేకరణకు సంబంధించి ఆయన తన అభిప్రాయాలను వ్యక్తం చేశారు, అధిప్పడ్డి పేరిట బలవంతంగా భూ సేకరణ జరగకూడదని పేర్కొన్నారు. అధికారులు నియమాలను పాటించాలి మరియు ప్రతిపాదిత ప్రాజెక్ట్ కోసం భూములు కోల్పోతున్న రైతులకు పరిహారం కింద మార్కెట్ విలువ కంటే మూడు రెట్లు ఇవ్వాలి. LARR చట్టం ప్రకారం, భూములు లేని వారికి, కౌలు రైతులకు కూడా పరిహారం ఇవ్వాలని ఆయన సూచించారు. ఎస్సీ, ఎస్టీ ప్రజల అసైన్డ్ భూములకు కూడా సమాన పరిహారం ఇవ్వాలని ఆయన కోరారు. ప్రభుత్వం ప్రవేశపెట్టిన కొత్త ధరణి పోర్టల్ కింద చాలా మంది రైతులు తమ కొత్త పాస్‌బుక్‌లు అందుకోలేదని, వారిని ప్రభుత్వం ఇబ్బంది పెట్టకుండా వారికి మీగతా వారి లగే పరిహారం ఇవ్వాలని కోరారు. ఇంతకుముందు, ఇదే సందర్భంలో అంటే, కాళేశ్వరం ప్రాజెక్టులో, ఎల్లన్న సాగర్ ప్రభావిత ప్రజలకు పరిహారం అందలేదని ఆయన తెలియజేశారు. అధికారులు భూమిలో ఉన్న అన్ని పదార్థాల విలువలను లెక్కించి, ఆ పదార్థాల విలువతో సహా పరిహారం ఇవ్వాలని కోరారు. ప్రాజక్టును సకాలంలో పూర్తి చేయాలని ఆయన కోరారు.

జిల్లా కలెక్టర్ గారు ప్రజాభిప్రాయ సేకరణలో పాల్గొన్న వారిని ఉద్దేశించి వక్తలు పర్యావరణానికి సంబంధించిన సమస్యలు మరియు అభిప్రాయాన్ని సంక్షిప్తం చేసి ఇవ్వాలని విజ్ఞప్తి చేశారు

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మరియు చెప్పిన విషయాలను పునరావృతం చేసే సమయాన్ని వృధా చేయకుండా వారి అభిప్రాయాలు క్లుప్తంగా, స్పష్టంగా చెప్పాలని విజ్ఞప్తి చేశారు.

5. **శ్రీ జియావుద్దీన్ అహ్మద్, SE (రిటైర్డ్), కాళేశ్వరం ప్రాజెక్ట్:** సాంప్రదాయ సభావందన ప్రసంగం అనంతరం, అతను, EIA ప్రక్రియను మందులు తయారు చేసే కర్మాగారాలకు మరియు రసాయన కర్మాగారాలకు వర్తింపజేయాలని, నీటిపారుదల ప్రాజెక్టుల వలన పర్యావరణం ప్రభావితం అవడం చాలా తక్కువ అని నీటిపారుదల ప్రాజెక్టులు పర్యావరణ స్థితిని పెంచడానికి దోహదపడతాయని, అందుకని నీటిపారుదల ప్రాజెక్టులను EIA ప్రక్రియలో లేకుండా చేయవలసింది అని అతను భావించాడు. పర్యావరణ క్లియరెన్స్ అవసరమయ్యే ప్రతి సందర్భంలోనూ పర్యావరణ ఇంజనీర్లు సంక్లిష్టమైన విధానాన్ని అనుసరించడానికి ఇబ్బందులు పడుతున్నారు. ఈ ప్రాంతంలో JE గా తన అనుభవాన్ని వివరించాడు, 6,000 ఎకరాల భూమికి సాగునీటిని అందించడం గురించి ఉన్న నిబంధనచెపుతూ, అతను ఇది ఇప్పుడు 4,00,000 ఎకరాల ప్రాజెక్టుగా మారింది అని అన్నారు. నీరు ఖచ్చితంగా పర్యావరణ స్థితిని మెరుగుపరుస్తుందని అయన పేర్కొన్నారు. వికారాబాద్ మరియు పరిగి మొత్తం తెలంగాణ రాష్ట్రంలో అత్యుత్తమ పర్యావరణాన్ని పొందుతాయి మరియు ఈ ప్రాంతానికి తగినన్ని నీటిని అందించడం వలన పర్యావరణ నాణ్యత మరింత మెరుగు పడుతుందని చెప్పాయ. ఈ ప్రాంతంలో ఆయకట్ ప్రాంతం యొక్క కవరేజ్ ఉంటుంది కాబట్టి ఈ ప్రాంతం బహుళ ప్రయోజనాలను పొందుతుందని మరియు ఈ ప్రాంతంలో రిజర్వాయర్ ప్రణాళిక చేయనందున, చూ సేకరణ కాలువల తవ్వకాలకు మాత్రమే పరిమితం చేయబడుతుందని అయన సూచించారు. పరిగి పట్టణానికి నీరు తీసుకురావడానికి కాలువల కోసం సేకరణలో ఉన్న తమ భూములను ఇచ్చేటప్పుడు ప్రజలు ఉదారంగా ఉండాలని అయన అభ్యర్థించారు. ఈ చిన్న ఫుడ్ ప్రాసెసింగ్ పరిశ్రమల ఏర్పాటుకు సహాయపడుతుంది మరియు పర్యాటక రంగం కూడా అభివృద్ధి చెందుతుంది మరియు తగినంత నీరు అందుబాటులో ఉన్నందున పరిగి ఆరోగ్యకరమైన జీవన ప్రదేశానికి ప్రాధాన్యతనిస్తుంది. ఈ ప్రాంతంలోని ప్రజలు తగినంతగా చదువుకోలేదని మరియు వారి వ్యవసాయ ఉత్పత్తులకు కనీస ధర లభించడం లేదని అతను భావించాడు. అతను ముడి మొక్కజొన్నను పాప్ కార్న్ గా మార్చడం ద్వారా విక్రయించడాన్ని ఉదాహరణగా పేర్కొన్నాడు. ములకనూర్ కొబ్బరిచిప్ప సొసైటీ గురించి చెబుతూ, అక్కడ ప్రజల ఉమ్మడి మరియు అంకితభావం వారి వ్యవసాయ ఉత్పత్తులకు సంపదను అందించాయి. ఆదే మార్గాన్ని ఇక్కడి ప్రజలు అనుసరించాలని మరియు విలువ ఆధారిత ఉత్పత్తులను విక్రయించడం ద్వారా ప్రతిపాదిత ప్రాజెక్ట్ నుండి ప్రయోజనం పొందాలని అయన ప్రజలకు సూచించారు. అయన తన ప్రసంగాన్ని ముగించారు.

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జిల్లా కలెక్టర్ గారు ప్రజలకు తమ అభిప్రాయాలను పర్యావరణానికి సంబంధించిన మరియు పరిమితం చేసి చెప్పాలని మరోసారి విజ్ఞప్తి చేశారు.

6. **శ్రీ ముకుంద వాగేశ్వర్, r/o. పరిగి:** ఈ ప్రాంతానికి సీటి సరఫరా ప్రాజెక్టును విస్తరించడానికి నిర్ణయం తీసుకున్నందుకు అతను సంతోషంగా ఉన్నాడు మరియు ప్రభుత్వానికి కృతజ్ఞతలు తెలిపాడు. విభజనకు ముందు ఉన్న రంగారెడ్డి జిల్లాలో 14 లక్షల ఎకరాల వ్యవసాయ యోగ్యమైన భూమి ఉన్నప్పటికీ, సీటిపారుదల సౌకర్యాలు 1.5 లక్షల ఎకరాలకు మాత్రమే విస్తరించబడ్డాయి. ప్రాణహిత చేవెళ్ల సాగునీటి పథకం ద్వారా 5.5 లక్షల ఎకరాల వరకు ప్రయోజనం పొందాలని ప్రజలు తీవ్రంగా ఆశించారు, అయితే కవరేజ్ పరిధి కేవలం మెదక్ జిల్లాకు మాత్రమే పరిమితం చేయబడింది. ఇప్పుడు ఈ ప్రాజెక్ట్ ద్వారా జిల్లాలో 3.2 లక్షల ఎకరాలకు సాగునీరు అందించబడుతుంది. ఇతర రాష్ట్రాలతో వివాదం ఉండదు కాబట్టి శ్రీశైలం బ్యాక్ వాటర్‌కు బదులుగా ఎత్తైన ప్రదేశాలలో ఉన్న జూరాల ప్రాజెక్ట్ నుండి నీటిని లిఫ్ట్ చేయాలని అయన కోరారు. ప్రాజెక్ట్ పనులు చేపట్టే గ్రామాల సంప్రదాయాలు మరియు ఆచారాలను ప్రభుత్వం పరిరక్షించాలని ఆయన కోరారు. ఈ ప్రాజెక్ట్ లో ఆస్తి పోయినవాళ్ళకి ఎలాంటి నష్టం జరగకుండా ఉండటానికి భూమికి బదులుగా భూమి మరియు ఇంటికి బదులుగా ఇంటిని పరిహారంగా ఇవ్వాలని అతను కోరాడు. రైతుల భూముల నుండి వెళ్లే కాలువలపై సౌర పలకాలను ఏర్పాటు చేయాలని, అటువంటి సౌర వ్యవస్థల ద్వారా ఉత్పత్తి అయ్యే విద్యుత్ నుండి ప్రయోజనాన్ని రైతులకు అందచేయాలని ఆయన అభిప్రాయపడ్డారు. కాళేశ్వరం ప్రాజెక్టుతో సమానంగా భూమిని వదులుకునే వారికి తగిన పరిహారం అందించాలని ఆయన కోరారు.

జిల్లా కలెక్టర్, వికారాబాద్ గారు ప్రసంగాలలో సంక్షిప్తత కోసం మరోసారి ప్రజలకు విజ్ఞప్తి చేశారు.

7. **శ్రీ ఎస్. సుధాకర్ రెడ్డి, r/o. మిల్కాపూర్:** వికారాబాద్ జిల్లాకు నీరు ఉదుందాపూర్ రిజర్వాయర్ నుండి సరఫరా చేయబడుతుందని ఆయన సూచించారు. అతని ప్రధాన వాదన, కుల్కచెర్ల మండలం, ఉదుందాపూర్ జలాశయానికి సమీప గ్రామం 10 కిమీలు మరియు అతని సమాచారం ఆధారంగా కొన్ని గ్రామాలకు నీరు సరఫరా కావడం లేదు. నాగ్మెడ మండలం కోటాల గ్రామం నుండి చౌదాపూర్ గ్రామానికి సీటిని సహజంగా తూర్పుకు ప్రవహించే వాగు నుండి సీటిని తీసుకోవాలని ఆయన సూచించారు. అందువల్ల ఇప్పటివరకు సీటి సరఫరా చేయని మరిన్ని ప్రాంతాల కవరేజీని సులభతరం చేయడానికి కాలువను లీలైన్ చేయాలని ఆయన అభ్యర్థించారు.

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8. **శ్రీ. ఎస్. ఖగప్, ఆర్/ఓ. రాఘవపూర్ విలేజ్:** ఈ ప్రాజెక్ట్ కోసం చాలా సంవత్సరాల నుండి ప్రజలు ఎదురుచూస్తున్నారు, ఇప్పుడు వారి కల నెరవేరిందని ఆయన తెలియజేశారు. రాఘవపూర్ స్టేషన్ నుండి పరిగి, కొడంగల్ మరియు తాండూర్ పట్టణాలకు తాగునీరు సరఫరా చేయబడిన మిషన్ భగీరథకు ఆయన ఉదాహరణ ఇచ్చారు. రాఘవపూర్‌లో ఉన్న మిషన్ భగీరథ స్టేషన్ కారణంగా తమ గ్రామంలో భూగర్భ జలాలు పెరిగాయని ఆయన తెలియజేశారు. చిన్న ప్రాజెక్ట్ కారణంగా భూగర్భ జలాలు 500 అడుగుల నుండి 80 అడుగులకు పెరిగాయి, కాబట్టి ప్రస్తుత ప్రాజెక్ట్ భూగర్భజలాలను విపరీతంగా పెంచుతుంది, భూగర్భ జలాలను ఉపయోగించడం ద్వారా మరో 3 లక్షల ఎకరాల భూమిని సాగు చేయవచ్చు అని చెప్పి తన ప్రసంగాన్ని ముగించారు.

9. **శ్రీమతి. సత్యభారిచంద్ర, MPP, కుల్కచెర్ల:** ఆమె సమావేశాన్ని స్వాగతించింది మరియు ప్రతిపాదిత ప్రాజెక్ట్ కోసం తన సంతోషాన్ని వ్యక్తం చేసింది. 30-40 సంవత్సరాల నుండి వారు ఈ ప్రాజెక్ట్ కోసం ఎదురు చూస్తున్నారని ఆమె తెలియజేసింది. వారి గ్రామంలో భూగర్భ జలాలు కీణించాయి, ప్రతిపాదిత ప్రాజెక్ట్ కారణంగా భూగర్భ జలాలు పెరుగుతాయి. వికారాబాద్ ఏర్పడిన జిల్లా అని మరియు జిల్లా అభివృద్ధికి ఈ రకమైన ప్రాజెక్టులు అవసరమని ఆమె చెప్పారు.

10. **శ్రీ జి.శ్రీనివాస్, EE (రిటైర్డ్) (తల్వకుర్తి లిఫ్ట్ ఇరిగేషన్ ప్రాజెక్ట్, కోయల్సాగర్ మరియు PRLIS):** PRLIS ప్రారంభమైనందుకు ఈ రోజు తనకు చాలా సంతోషంగా ఉందని ఆయన తెలియజేశారు. అతను మహబూబ్‌నగర్, దక్షిణ-తెలంగాణకు చెందినవాడినని, అక్కడ వర్షపాతం చాలా తక్కువగా ఉంటుందని, అంటే 70 మిమీ నుండి 80 మిమీ మాత్రమే అని ఆయన పేర్కొన్నారు. అతను గత 30 ఏళ్లలో ప్రతి రెండు సంవత్సరాల కొకసారి కరువును చూశానని పేర్కొన్నారు. భూగర్భ జలాలపై ఆధారపడే రైతులు ఒకే పంటను సాగు చేయవలసి వస్తుంది. చాలా మంది రైతులు వలస పెళ్లి కూలీలుగా పని చేయవలసి వస్తుంది. తెలంగాణ ఏర్పడిన తర్వాత ప్రభుత్వం సాగునీటి ప్రాజెక్టులపై దృష్టి పెట్టిందని ఆయన తెలియజేశారు. అనేక ప్రాజెక్టులు చేపట్టబడ్డాయి, వాటిలో PRLIS ఒకటి. జూరాల రిజర్వాయర్ నుండి నీటిని తీసుకొని సాంకేతిక సమస్యల గురించి ఆయన వివరించారు. జూరాల రిజర్వాయర్ కుడిలం 9 టీఎంసీల సామర్థ్యాన్ని కలిగి ఉంది. PRLIS 60 రోజుల పాటు 90 TMC నీటిని (ప్రతిరోజు 1.5 TMC) డ్రా చేయాలని ప్రతిపాదించింది. అందువల్ల, కృష్ణాలం రిజర్వాయర్ సామర్థ్యం 250 టీఎంసీలుగా ఉన్నందున కృష్ణాలం రిజర్వాయర్ ఉత్తమ ఎంపిక. వికారాబాద్ జిల్లాకు 18 మండలాల్లో 3,41,000 ఎకరాలకు సాగునీరు అందుతుందని ఆయన తెలియజేశారు. ఈరోజు పబ్లిక్ హియరింగ్ నిర్వహిస్తున్న ఈ ప్రాజెక్ట్ కోసం

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పర్యావరణ క్లియరెన్స్ తప్పనిసరి అని ఆయన పేర్కొన్నారు. ప్రతి ఒక్కరూ ఈ ప్రాజెక్టుకు మద్దతు ఇస్తున్నందున అతను తన సంతోషాన్ని వ్యక్తం చేశాడు. వికారాబాద్ హైదరాబాద్‌కు చాలా దగ్గరగా ఉంది, రైతులు కూరగాయలు మరియు పండ్లు వంటి వాణిజ్య పంటలను ఎంచుకొని వారి ఆర్థిక వ్యవస్థను పెంచుకోవచ్చు, భూగర్భ జలాలు కూడా పెరుగుతాయని, రైతులు బోర్‌వెల్‌ల నుండి నీటిని కూడా తీసుకోవచ్చునని ఆయన తెలియజేశారు.

11. శ్రీ కె. రాజి రెడ్డి, సర్పంచ్, దేమ: అతను సమావేశ సభకు స్వాగతం పలికాడు మరియు వారి మండలంలో 10 గ్రామ పంచాయతీలకు ప్రతిపాదిత ప్రాజెక్ట్ నుండి నీరు అందడం లేదని తెలియజేశాడు. వారి మండలంలో మొత్తం 20,000 ఎకరాలు ఉన్నాయి, ఇప్పటి వరకు సాగునీటి కాలువలు లేవు. ఈ రోజు అతను చాలా సంతోషంగా ఉన్నాడు, వారు కాలువలను పొందబోతున్నారు మరియు రైతులు ప్రాజెక్ట్ కోసం భూములు ఇవ్వడం చాలా సంతోషంగా ఉంది. తమ మండలంలోని అన్ని గ్రామాలు కవర్ అయ్యే విధంగా ప్రాజెక్ట్ డిజైన్‌ను మార్చాలని ఆయన నీటిపారుదల అధికారులను అభ్యర్థించారు.

ఈ దశలో జిల్లా కలెక్టర్, వికారాబాద్ గారు, ప్రసంగాలలో సంక్షిప్తత కోసం మరియు కోవిడ్ ప్రోటోకాల్‌ను అనుసరించాలని విజ్ఞప్తి చేశారు.

12. శ్రీ కోట్ల యాదగిరి, R/o. బొమ్రాస్‌పేట్ గ్రామం: అతను ఈ ప్రాజెక్టును స్వాగతించాడు మరియు 2015 లో గౌరవనీయులైన ముఖ్యమంత్రి కాగు మరియు నీటిపారుదల ప్రయోజనం కోసం నీటిని సరఫరా చేస్తానని మీరు ఇచ్చినట్లు తెలియజేశారు. ఇప్పుడు 2021 లో, ప్రాజెక్ట్ ప్రారంభమైంది. ప్రాజెక్టును సకాలంలో పూర్తి చేయాలని అధికారులను అభ్యర్థించారు, తద్వారా ఈ ప్రాంతం అభివృద్ధి చెందుతుంది. వారి పూర్వీకులు మోటా బావి నుండి నీటిని తోడే పద్ధతిలో వారు పడ్డ కష్టాలను ఒక ఉదాహరణగా చెప్పాడు. మిషన్ భగీరథ కారణంగా వారికి కాగునీరు అందుతోందని అయన తెలియజేశారు. జిల్లా అభివృద్ధికి ఈ ప్రాజక్ట్ చాలా అవసరమని అయన సూచించారు. అప్పటి మహబూబ్ నగర్ జిల్లా కార్మిక జిల్లాగా పిలువబడుతుందని అయన తెలియజేశారు. ఈ ప్రాజెక్ట్ కారణంగా రైతుల వలసలు తగ్గుతాయి, భవిష్యత్తు తరం విద్యావంతులవుతారు. అన్ని గ్రామాలు ఈ ప్రాజెక్ట్ పరిధిలోకి వచ్చే విధంగా ప్రాజెక్ట్ డిజైన్‌ను మార్చాలని అయన నీటిపారుదల అధికారులను అభ్యర్థించారు. గౌరవనీయులైన ముఖ్యమంత్రికి అయన కృతజ్ఞతలు తెలిపారు. కొంతమంది వ్యక్తులు భూములు కోల్పోవచ్చు కానీ చాలామంది ప్రయోజనం పొందుతారని అయన తెలియజేశారు. కాళేశ్వరం ప్రాజెక్ట్ మాదిరిగానే ప్రాజెక్టును గడువులోగా పూర్తి చేయాలని అయన నీటిపారుదల అధికారులను అభ్యర్థించారు.

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13. శ్రీ మల్లేశం, R/o. కనకల్ (V), పూడూరు మండలం: మహబూబ్ నగర్, రంగారెడ్డి మరియు నల్గొండ జిల్లా దాలా ఎనుకబడిన జిల్లాలు అని ఆయన పేర్కొన్నారు. ఈ జిల్లాలకు ప్రభుత్వం నీటిని సరఫరా చేస్తుందని గౌరవ ముఖ్యమంత్రి హామీ ఇచ్చారు, దీని ప్రకారం, ప్రతిపాదిత ప్రాజెక్ట్ కార్యరూపం దాల్చింది. మహబూబ్ నగర్ జిల్లా కొరిక జిల్లాగా పిలువబడుతుంది మరియు దాలా మంది రైతులు బతుకుదెరువు కోసం ముంబై మరియు పుణెకు వలస వెళ్లారు. భూగర్భ జలాలను పొందడానికి రైతు 1000 అడుగుల వరకు బోర్‌వెల్ త్రవ్వాల్సి వస్తుంది. గౌరవనీయులైన ముఖ్యమంత్రికి ఆయన హృదయపూర్వక కృతజ్ఞతలు తెలిపారు. రైతులందరూ వరి మరియు ఇతర పంటలను సంతోషంగా పండిస్తారని ఆయన తెలియజేశారు. కొన్ని కుటుంబాలకు నష్టం జరగవచ్చు కానీ అనేక కుటుంబాలు ప్రయోజనం పొందుతాయి. భూములు కోల్పోతున్న కుటుంబాలను రక్షించాలని ఆయన ప్రభుత్వాన్ని కోరారు. 70 సంవత్సరాల తరువాత, వారి కలలు నిజమయ్యాయని ఆయన తెలియజేశారు. వారు తమ గ్రామంలో మాత్రమే సంతోషకరమైన జీవితాన్ని గడపగలరని ఆయన సూచించారు. వారి పిల్లలు అమెరికా వెళ్లాల్సిన అవసరం లేదు, వారు ఈ ప్రాంతాన్ని అభివృద్ధి చేయవచ్చు. కాళేశ్వరం ప్రాజెక్ట్ మాదిరిగానే ప్రాజెక్టును గడువులోగా పూర్తి చేయాలని ఆయన నీటిపారుదల అధికారులను అభ్యర్థించారు.

14. శ్రీ వెంకటరామకృష్ణ రెడ్డి, R/o. పాయదపల్లి: అతను ఈ ప్రాజెక్టును స్వాగతించాడు మరియు అతను పంటలు సాగు చేయడానికి వర్షపాతంపై ఆధారపడిన రైతు అని తెలియజేశాడు. వికారాబాద్ జిల్లాలో దాలా తక్కువ వర్షపాతం మరియు తక్కువ భూగర్భ జలాలు ఉన్నాయి. ఇప్పుడు వారు నీటిపారుదల కొరకు తగినంత నీటిని పొందలోతున్నారు మరియు తమ సంతోషాన్ని వ్యక్తం చేసారు మరియు గడువులోగా ప్రాజెక్ట్ పూర్తి చేయాలని అభ్యర్థించారు.

15. శ్రీ మహమ్మద్ జాఫర్, R/o. పాయదపల్లి: అతను ప్రాజెక్టును స్వాగతించాడు మరియు గ్రామస్థులందరికీ అభినందనలు తెలిపాడు. ఈ ప్రాజెక్ట్ కోసం వారు చాలా ఏళ్లుగా ఎదురుచూస్తున్నారని ఆయన తెలియజేశారు. అయితే, లక్ష్మీదేవరపల్లిలో ప్రతిపాదిత కాల్వల ఖచ్చితమైన ప్రదేశం మరియు ఎంత నీరు సరఫరా చేయబడుతుందనే దాని గురించి అతనికి ఖచ్చితంగా తెలియదు అని చెప్పాడు. వారు దాలా సంతోషంగా ఉన్నారు మరియు ప్రాజెక్టుకు మద్దతు ఇస్తున్నారు అని తెలిపాడు.

16. శ్రీ టి.వెంకటేశ్, ఆర్/ఓ. మత్స్య సంఘ సభ్యుడు పల్లి: మత్స్య సంపదను పెంచడం ద్వారా వారు జీవనోపాధి పొందబోతున్నందున అతను ఈ ప్రాజెక్టును స్వాగతించాడు మరియు దాలా

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సంతోషంగా ఉన్నాడు. గ్రామంలో మత్స్యసంపదపై ఆధారపడి 300 కుటుంబాలు ఉన్నాయి. వేలాది ఎకరాల సాగులో ఉన్న ఈ ప్రాజెక్ట్ ద్వారా అన్ని కుటుంబాలు ప్రయోజనం పొందుతాయి.

17. శ్రీ జి. శంకర్, సర్పంచ్, దామియా తండా, కుల్కచెర్ల మండలం: అతను ఈ ప్రాజెక్టును స్వాగతిందాడు మరియు వికారాబాద్ జిల్లాలో అనేక తాండాలు ఉన్నాయని ఆయన తెలియజేశారు. ఈ ప్రాజెక్టుతో చాలా మంది రైతులు ప్రయోజనం పొందుతారని ఆయన తెలియజేశారు. అనేక కుంటలు ఆక్రమణకు గురయ్యాయని, ఆక్రమణలను తొలగించి నీటితో నింపాలని, తద్వారా భూగర్భ జలాలు పెరిగేలా చూడాలని ఆయన కోరారు.

18. శ్రీ B. హనుమంత్ ముదిరాజ్, డిసిసి ప్రెసిడెంట్, పర్గి: ఈ ప్రాంతంలో ఇప్పటి వరకు సాగునీటి ప్రాజెక్టులు లేవని, తక్కువ వర్షపాతం కారణంగా చాలా మంది రైతులు ప్రైవేట్ ఫైనాన్షియర్లపై ఆధారపడి ఉన్నారని మరియు క్లిష్టలను తిరిగి చెల్లించే స్థితిలో లేరని ఆయన తెలియజేశారు. ప్రతిపాదిత ప్రాజెక్ట్ నీటిపారుదల కోసం తగినంత నీటిని తెస్తుంది. ప్రాజెక్ట్ ఆలస్యమైందని, వెంటనే పూర్తి చేయాలని ప్రభుత్వాన్ని అభ్యర్థించారు. ప్రతిఒక్కరికీ భూమి, ఇల్లు మరియు ఇంటికి ఉద్యోగం ఇవ్వడం ద్వారా నష్టపోయిన వారికి పరిహారం అందించాలని ఆయన ప్రభుత్వాన్ని అభ్యర్థించారు. పరిహారం మార్కెట్ ధరతో సమానంగా ఉండాలి. ఈ ప్రాంతాలలో సాగునీటి ప్రాజెక్టులు అవసరమని ఆయన అన్నారు, కాని గౌరవనీయులైన ముఖ్యమంత్రి ఉత్తర తెలంగాణలో కేంద్రీకరిస్తున్నారు. శ్రీశైలం రిజర్వాయర్‌తో పోలిస్తే జూరాల రిజర్వాయర్ సమీపంలో ఉన్నందున నీటిని తీసివేసే అవకాశాన్ని అన్వేషించాలని ఆయన నీటిపారుదల సిబ్బందిని అభ్యర్థించారు. లక్ష్మీదేవిపల్లి ప్రాజెక్టును కేంద్ర ప్రభుత్వం గుర్తించలేదని, అందువల్ల ప్రభుత్వం ఈ విషయాన్ని పరిశీలించాలని ఆయన పేర్కొన్నారు. దక్షిణ తెలంగాణలో సాగునీటి ప్రాజెక్టుల అవసరాన్ని ఆయన నొక్కిచెప్పారు. ప్రాజెక్ట్ అభివృద్ధికి నీరు మరియు విద్యుత్ అవసరం. పరిహారం నిబంధన ప్రకారం ఇవ్వాలని కోరారు.

19. శ్రీ రామదాస్ నాయక్, R/o. కులకచెర్ల మండలం: ఈ ప్రాజెక్ట్ కోసం నారు చాలా ఏళ్లుగా ఎదురుచూస్తున్నారని ఆయన తెలియజేశారు. పొరుగు రాష్ట్రాల రైతులు ప్రతి సంవత్సరం రెండు పంటలు సాగు చేస్తున్నారని, కానీ వికారాబాద్ రైతులకు ఒక్క పంటకు కూడా సాగు చేయడానికి నీరు లేదని ఆయన పేర్కొన్నారు రైతులు బోరుబావుల కోసం లక్షలాది రూపాయలు ఖర్చించి

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నీటిని పొందవలసి వస్తుంది. ఈ పరిస్థితిలో, ప్రతిపాదిత ప్రాజెక్ట్ చాలా ఉపయోగకరంగా ఉంటుంది. స్వాతంత్ర్యం వచ్చిన 70 సంవత్సరాల నుండి ఈ ప్రాంతానికి ఈ రకమైన సాగునీటి ప్రాజెక్టులను తీసుకురావడానికి ఏ ప్రభుత్వం కూడా చొరవ తీసుకోలేదు. గౌరవనీయులైన ముఖ్యమంత్రికి ఆయన హృదయపూర్వక కృతజ్ఞతలు తెలిపారు. వికారాబాద్ వెనుకబడిన జిల్లా అని, మనుగడ కోసం అనేక పలసలు జరిగాయని ఆయన తెలియజేశారు. ఇప్పుడు, వలసలు తగ్గుతాయి.

20. **శ్రీ వి. రవీంద్ర, ఆర్/ఓ. పర్గి:** అతను ప్రాజెక్టును స్వాగతించాడు మరియు పబ్లిక్ హియరింగ్ అనేది పర్యావరణ సమస్యలను మాత్రమే చర్చించే వేదిక అని మరియు ప్రతిపాదిత ప్రాజెక్ట్ ద్వారా పర్యావరణం మెరుగుపడుతుందని పేర్కొన్నాడు. చాలా మంది ప్రజలు నగరాలకు వలస వెళ్లి కార్మికులుగా పని చేయవలసి వచ్చింది. ఇప్పుడు, వలసలు తగ్గుతాయి. ఈ ప్రాజెక్ట్ పశుపోషణను కూడా పెంచుతుంది. వివిధ రకాల మొక్కలు అభివృద్ధి చేయబడతాయి. పర్యాటకం, మత్స్య సంపద అభివృద్ధి చెందుతుందని ఆయన తెలియజేశారు. ఈ ప్రాజెక్ట్ పట్ల అందరూ సంతోషంగా ఉన్నారు.

21. **శ్రీ. వి. రవి కుమార్, ఆర్/ఓ. పర్గి:** అతను ప్రాజెక్టును స్వాగతిందాడు మరియు పబ్లిక్ హియరింగ్ అనేది పర్యావరణ సమస్యలపై మాత్రమే చర్చించే వేదిక అని పేర్కొన్నాడు. వారి చిరకాల కల నెరవేరిందని ఆయన తెలియజేశారు. రైతులు సాగుకు నీరు పొందడం పట్ల వారు చాలా సంతోషంగా ఉన్నారు. అతను ప్రాజెక్ట్ కోసం తన మద్దతును అందిందాడు మరియు ఉపాదిని తెలియజేసాడు, ఈ ప్రాంతంలో పరిశ్రమలు వస్తాయి.

22. **శ్రీ. పీర్ మహమ్మద్, R/o. నారాయణపూర్:** అయన ఈ ప్రాజెక్టును స్వాగతిందారు మరియు కాళేశ్వరం ప్రాజెక్ట్ ప్రయోజనాలను హైలైట్ చేసారు, కాళేశ్వరం నీటిపారుదల ప్రాజెక్ట్ కారణంగా కరీంనగర్ అభివృద్ధి చెందింది. ప్రతిపాదిత సాగునీటి ప్రాజెక్టు కారణంగా రైతు సంవత్సరంలో 3 పంటలు పండించవచ్చని ఆయన తెలియజేశారు. భూములు కోల్పోతున్న రైతులకు పరిహారం కోసం ఆయన నొక్కిచెప్పారు. మల్లనసాగర్ ప్రాజెక్టులో పరిహారం అమలు చేయకపోవడం వల్ల అనేక కోర్టు కేసులు దాఖలయ్యాయని, అలాంటి వాటిని పునరావృతం చేయవద్దని ప్రభుత్వాన్ని అభ్యర్థించారు. నీటిపారుదల ప్రయోజనం కోసం తగినంత నీరు వస్తుందని ఆయన తెలియజేశారు. ఈ ప్రాజెక్టును ఎవరూ వ్యతిరేకించలేరు మరియు ప్రతి ఒక్కరూ మద్దతు ఇవ్వాలి.

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23. శ్రీ పి.అంజిలయ్య, R/o చెల్లాపూర్: అతను ఈ ప్రాజెక్టును స్వాగతించాడు మరియు గ్రామస్తులు ఇప్పటికి ఈ ప్రాజెక్ట్ గురించి చర్చించి, మద్దతు ఇవ్వాలని నిర్ణయించుకున్నారని తెలియజేశారు. వ్యవసాయానికి సరిపడా నీరు అందుతుండడంతో వారు చాలా సంతోషంగా ఉన్నారు.

24. శ్రీ ఎం. రాజేందర్, R/o. నస్కల్: ప్రతిపాదిత ప్రాజెక్ట్ ఎత్తిపోతల హేయరింగ్ కోసం అతను సమావేశాన్ని స్వాగతించాడు. అతను ప్రతిపాదిత ప్రాజెక్ట్ పట్ల తన సంతోషాన్ని వ్యక్తం చేశాడు. ఈ ఇరిగేషన్ ప్రాజెక్ట్ కోసం మా నాయకులు చాలా సంవత్సరాలు పోరాడారని అయన తెలియజేశారు. ఈ ప్రభుత్వం 24 గంటల విద్యుత్ సరఫరా, నీటిపారుదల ప్రాజెక్టులు వంటి అనేక పాలసీలను తీసుకుంది. రైతులు సంతోషంగా ఉన్నారని, వారి దీర్ఘకాల కల నెరవేరిందని ఆయన తెలియజేశారు. ప్రతి రైతు వ్యవసాయానికి సరిపడా నీరు అందుతున్నందున ప్రతి ఒక్కరూ ఈ ప్రాజెక్టును ఆదుకోవాలని అయన కోరారు. సాగునీటి ప్రాజెక్టుల వల్ల భూగర్భ జలాలు పెరుగుతాయి భూగర్భ జలాలను పంచే చిన్న చెక్ డ్యామ్‌లు, రెయిన్‌వాటర్ హార్వెస్టింగ్ పిట్స్ పై దృష్టి పెట్టాలని మరియు స్థానిక నీటి ఎసయలను నీటితో నింపాలని ఆయన ప్రభుత్వాన్ని అభ్యర్థించారు.

25. శ్రీ ఎం. నాగరాజు, ఆర్/ఓ. మండిపాల్, కుల్కచెర్ల: తాను ఇతర ప్రాంతాలలో అనేక ఫోరమీలను చూశానని మరియు తన స్వంత ప్రాంతంలో ప్రతిపాదిత నీటిపారుదల ప్రాజెక్టును చూసినందుకు చాలా సంతోషంగా ఉందని అయన తెలియజేశారు. అతను ప్రతిఒక్కరికి నీటి ప్రాముఖ్యతను గుర్తించాడు. ఇతర ప్రాంతాలలో బోర్లు పడి ప్రాంతం ఎడారి లాంటిదని మరియు ప్రతిపాదిత కాలువలు భూగర్భ జలాలను పెంచుతాయని ఆయన పేర్కొన్నారు. గౌరవనీయులైన సిఎం మరియు ఇంజనీర్లకు ఆయన హృదయపూర్వక ధన్యవాదాలు తెలిపారు. ఈ ప్రాంతం చాలా పొడిగా ఉందని మరియు నీరు లేకపోవడం వల్ల చాలా మంది రైతులు పలస వెళ్లారని మరియు ఆర్థిక సమస్యల కారణంగా అనేక ఆత్మహత్యలు జరిగాయని ఆయన చెప్పారు. ఈ ప్రాజెక్ట్ ఈ ప్రాంతానికి అభివృద్ధిని తీసుకురావమ్మ మరియు అతను ప్రాజెక్టుకు మద్దతు ఇచ్చాడు. గడువులోగా ప్రాజెక్ట్ పూర్తి చేయాలని ఆయన అభ్యర్థించారు.

26. శ్రీ S. ఖంగయ్య, R/o. ఖలాపూర్ (V): అతను తన సంతోషాన్ని వ్యక్తం చేశాడు మరియు ఈ ప్రతిపాదిత ప్రాజెక్ట్ వల్ల రైతులు సంతోషంగా ఉన్నారని తెలియజేశారు. మనుషులు మాత్రమే

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కాకుండా మొక్కలు కూడా సంతోషంగా ఉన్నాయని ఆయన పేర్కొన్నారు. భూగర్భ జలాలు పెరుగుతాయి, చెట్ల నుండి స్వచ్ఛమైన ఆక్సిజన్ లభిస్తుంది. మన పూర్వీకులు 80 సంవత్సరాల వరకు జీవించడానికి మంచి వాతావరణం కారణంగా, చెట్లను నరకడం వల్ల ప్రాణవాయువు తగ్గిపోయిందని, రసాయన ఆహారం వల్ల మనుషుల ప్రస్తుత ఆరోగ్యం ప్రభావితం అవుతుందని ఆయన హైలైట్ చేశారు. భూగర్భ జలాల కొరత తగ్గుతుంది. ప్రతిపాదిత ప్రాజెక్ట్ నుండి నీటిని ఉపయోగించడం ద్వారా రైతులు మరిన్ని పంటలను సాగు చేయవచ్చు. నగదు ఇవ్వడానికి బదులుగా భూములు కోల్పోయే రైతులకు భూమి, ఇంటి నుండి భూమి ఇవ్వాలని ఆయన ప్రభుత్వాన్ని అభ్యర్థించారు.

27. **శ్రీ గోవింద నాయక్, R/o. దీపసంపల్లి తండా, దేమ మండలం:** అతను ఈ ప్రాజెక్టును స్వాగతించాడు మరియు రాతి మరియు ఇసుక మైనింగ్ కార్యకలాపాలకు అనుమతి ఇవ్వవద్దని ప్రభుత్వాన్ని అభ్యర్థించాడు. దాదా సంవత్సరాల కల నెరవేరిందని, ప్రభుత్వానికి కృతజ్ఞతలు తెలిపారు. దీని మండలంలోని 12 గ్రామపంచాయతీలు ఈ ప్రాజెక్టు పరిధిలో లేవని, ఈ గ్రామ పంచాయతీలకు కూడా నీటిని సరఫరా చేయాలని అభ్యర్థించారు.

28. **శ్రీ వి. మనోహర్ రెడ్డి, DCCP చైర్ పర్సన్, తెరుమల్‌పూర్ (V), కుల్కచెర్ల (M):** ప్రతిపాదిత సాగునీటి ప్రాజెక్ట్ పబ్లిక్ హియరింగ్ కోసం ఆయన అధికారికంగా స్వాగతం పలికారు. దాదా ఎల్లుగా రైతులు నీటి కొరత కారణంగా వ్యవసాయంలో అనేక సమస్యలను ఎదుర్కొంటున్నారని ఆయన తెలియజేశారు. సాగునీటి ప్రాజెక్టులను తీసుకురావడం ద్వారా ప్రభుత్వం మంచి నిర్ణయాలు తీసుకుంది. దాదాకాలంగా పెండింగ్‌లో ఉన్న కల నిజమైంది మరియు ప్రభుత్వానికి ధన్యవాదాలు. కుల్కచెర్ల మండలం వలసదారుల సంఖ్య ఎక్కువగా ఉందని ఆయన పేర్కొన్నారు. కుల్కచెర్ల మండల పరిధిలోని అన్ని గ్రామాలకు నీరు ఇచ్చే అవకాశాలను అన్వేషించాలని ఆయన నీటిపారుదల అధికారులను అభ్యర్థించారు. పర్యాటకం, పరిశ్రమల అభివృద్ధి వంటి ప్రాజెక్టుల ప్రయోజనాలను ఆయన హైలైట్ చేశారు. కాబట్టి, ప్రతి ఒక్కరూ ఈ ప్రాజెక్టుకు మద్దతు ఇవ్వాలి.

29. **శ్రీ కె. వెంకట్రామ్ రెడ్డి, ఆర్/ఓ. సుల్తాన్పూర్ (V):** అతను ఈ ప్రాజక్టును స్వాగతించాడు మరియు ప్రతి జీవికి నీరు, ఆక్సిజన్ మరియు ఆహారం యొక్క ప్రాముఖ్యతను నొక్కి చెప్పాడు. వీటిలో ప్రతి

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ఒక్కరికి నీరు ప్రదానమైనది. ప్రతిపాదిత ప్రాజెక్ట్ పట్ల ఆయన సంతోషం వ్యక్తం చేశారు. పర్యావరణానికి ఎలాంటి నష్టం జరగదని ఆయన పేర్కొన్నారు. ప్రమాదాల లోపల శబ్దం స్థాయిలను నిర్వహించడానికి కంట్రోల్ బ్లాస్టింగ్ గురించి అతను హైలైట్ చేశాడు. ప్రతిపాదిత ప్రాజెక్ట్ కారణంగా కొంతమంది రైతులు తమ భూములను కోల్పోతారు మరియు ప్రభుత్వం వారికి పరిహారం ఇస్తుంది.

30. శ్రీ E. కొండయ్య, R/o. పాల్వాడ (V), కుల్కచెర్ల (M): బహిరంగ విచారణ కోసం ప్రతిపాదిత సాగునీటి ప్రాజెక్ట్ కోసం అతను అధికారికంగా స్వాగతం పలికారు. ఉత్తర తెలంగాణలో అనేక ప్రాజెక్టులు వచ్చాయని, అయితే దక్షిణ తెలంగాణలో చాలా తక్కువ ప్రాజెక్టులు మాత్రమే ప్రతిపాదించబడ్డాయని ఆయన పేర్కొన్నారు. చాలా కాలం తర్వాత మా కల నిజమైంది. మిషన్ భగీరథ ప్రాజెక్ట్ ప్రయోజనాలను ఆయన హైలైట్ చేశారు. ప్రతిపాదిత ప్రాజెక్ట్ ద్వారా జంతువులు మరియు పశువులకు ప్రయోజనం చేకూరుతుందని కూడా ఆయన పేర్కొన్నారు. కుల్కచెర్ల మండలంలోని అన్ని గ్రామాలను కవర్ చేయాలని మరియు ప్రాజెక్టును సకాలంలో పూర్తి చేయాలని ఆయన అధికారులను అభ్యర్థించారు.

31. శ్రీ ఇ.రాఘవేందర్ గౌడ్, ఆర్/ఓ. ఘనపూర్ (V), కుల్కచెర్ల (M): వికారాబాద్ జిల్లాలో ఉన్న అన్ని తాండాలలో నీటి వసతి లేనందున చాలా మంది రైతులు తాండాల నుండి నగరాలకు వలస పోతున్నారని మరియు కూలీలుగా పని చేయవలసి వస్తోందని ఆయన తెలియజేశారు. ఫ్లోరైడ్ రిజర్వాయర్‌తో పోలిస్తే తక్కువ దూరం ఉన్నందున ఊరాల నీటిని తీసుకురావాలని ఆయన అధికారులను అభ్యర్థించారు. ప్రతిపాదిత ప్రాజెక్ట్ కోసం అతను సంతోషాన్ని వ్యక్తం చేశాడు.

32. శ్రీ టి. నాగవర్ధన్, ఆర్/ఓ, దామోల్: ప్రతిఒక్కరికి నీరు చాలా ముఖ్యమైన అంశమని, 70 ఏళ్ల స్వాతంత్ర్యం తర్వాత దీర్ఘకాలంగా పెండింగ్‌లో ఉన్న కల నిజమైందని ఆయన పేర్కొన్నారు. ఇప్పటికే చాలా ఆలస్యం అయినందున ప్రాజెక్టును వెంటనే పూర్తి చేయాలని ఆయన ప్రభుత్వాన్ని అభ్యర్థించారు. రైతు దేశానికి చాలా ముఖ్యం. ప్రస్తుతం, నీటి వనరులు లేనందున ఒక పంటను పొందడం చాలా కష్టంగా ఉంది. చాలా కుటుంబాలు వ్యవసాయంపై ఆధారపడి ఉన్నాయి. ఆర్థిక సమస్యల కారణంగా మరియు అనేక ఆత్మహత్యలు జరిగాయి.

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33. శ్రీ ఎస్. జనార్దన్ రెడ్డి, సర్పంచ్: అతను ప్రతిపాదిత ప్రాజెక్ట్ కోసం తన మద్దతును అందించాడు మరియు ఎవరినీ వ్యతిరేకించవద్దని అభ్యర్థించాడు. కొంతమంది రైతులు భూములు కోల్పోవచ్చు కానీ చాలా మంది రైతులు నీరు పొందుతారు మరియు ప్రయోజనం పొందుతారని ఆయన పేర్కొన్నారు. తగినంత నీటి వనరుల కారణంగా వ్యవసాయంలో ఈ ప్రాంతంలో రైతులు ఎదుర్కొంటున్న సమస్యలను కూడా ఆయన ఎత్తి చూపారు. నీటిపారుదల అధికారులకు ఆయన హృదయపూర్వక ధన్యవాదాలు తెలిపారు.

34. శ్రీ పరుశురాము రెడ్డి, R/o. పాయిదపల్లి (V), పఠిగి (M): ప్రతిపాదిత ప్రాజెక్టుకు ఆయన పూర్తి మద్దతును అందించారు మరియు 2008 లో గౌరవనీయులైన అప్పటి ముఖ్యమంత్రి డాక్టర్ వైఎస్ రాజశేఖర్ రెడ్డి ప్రాణహిత - చేవెళ్ల ప్రారంభోత్సవం చేశారని, కానీ నేటి వరకు వారు అందుకోలేదని తెలియజేశారు. 2011 లో అప్పటి ముఖ్యమంత్రి శ్రీ కిరణ్ కుమార్ రెడ్డి PRLIS ప్రాజెక్ట్ ను మంజూరు చేసినప్పటికీ ప్రారంభించలేదని ఆయన తెలియజేశారు. కాలువలు కచ్చితంగా ఎక్కడ ఉన్నాయో తెలియదని సందేహాలను ఆయన వ్యక్తం చేశారు. మా గౌరవనీయులైన ముఖ్యమంత్రి వాగ్దానం ప్రకారం భూమికి భూమి, అందరికీ ఉద్యోగం మరియు భూములు కోల్పోయే కుటుంబాలకు డబుల్ రూమ్ ఇవ్వాలని ఆయన అభ్యర్థించారు.

35. శ్రీమతి హరిప్రియ, R/o. పర్గి: ప్రతిపాదిత ప్రాజెక్ట్ కోసం ఆమె తన మద్దతును అందించింది మరియు ఈ ప్రాజెక్ట్ ద్వారా రైతులు ప్రయోజనం పొందుతారు. కూరగాయల వంటి వాణిజ్య పంటలకు వెళ్లాలని కూడా ఆమె సూచించారు.

36. శ్రీ ఆస్మకారం శ్రీశైలం, బండవెర్ల: ప్రతిపాదిత ప్రాజెక్ట్ ద్వారా 90 టిఎంసిల నీరు అందుతుందని, 10 ఎకరాలకు 1 టిఎంసి నీరు సరిపోతుందని ఆయన పేర్కొన్నారు. అందువల్ల, అన్ని భూములను సాగు చేయడానికి బదులుగా 5 నుండి 10 టిఎంసిల నీటిని తీసుకుని అవకాశాన్ని ప్రభుత్వం అన్వేషించాలి 13 గ్రామ పంచాయితీలకు నీరు అందడం లేదని, ఆ గ్రామ పంచాయతీలకు కూడా నీటిని సరఫరా చేయాలని ఆయన కోరారు. అధ్యయనం చేయడానికి మరియు కాలువలు ప్రతిపాదించబడిన మరియు ప్రభావిత గ్రామాల ఖచ్చితమైన ప్రాంతాలను తెలుసుకోవడానికి డిపిఆర్ ఇవ్వకపోవడం పట్ల ఆయన నిరాశ వ్యక్తం చేశారు. భూములు కోల్పోతున్న ప్రతి రైతుకు

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భూమికి భూమి ఇవ్వాలని ఆయన ప్రభుత్వాన్ని అభ్యర్థించారు. అతను వివరాలు ప్రాజెక్టుకు మద్దతు ఇచ్చాడు మరియు ఈ ప్రాజెక్ట్ కోసం చాలా గర్వపడ్డాడు.

వికారాబాద్ జిల్లా కలెక్టర్ గారు, ప్రజలు లేవనెత్తిన వివిధ సమస్యలపై తన ప్రతిస్పందనను అందించమని SE, నీటిపారుదల మరియు CAD శాఖను అభ్యర్థించారు.

శ్రీ కె. శ్రీనివాస్, ఎస్ ఇ. నీటిపారుదల శాఖ, మహబూబ్ నగర్ వారు తమ భూములను కోల్పోతున్న రైతులకు చట్టం / నిబంధనల ప్రకారం పరిహారం అందజేయబడుతుందని మరియు ప్రాజెక్టుకు మద్దతు ఇచ్చిన ప్రతి ఒక్కరికీ హృదయపూర్వక ధన్యవాదాలు తెలిపారు. వికారాబాద్ జిల్లాలో రిజర్వాయర్‌లు ప్రతిపాదించబడలేదని కూడా ఆయన తెలియజేశారు. వారు ప్రతి స్పీకర్ సూచనలను పరిగణనలోకి తీసుకుని అమలు చేస్తారని ఆయన తెలియజేశారు.

వికారాబాద్ జిల్లా కలెక్టర్ గారు, పబ్లిక్ హియరింగ్ సమయంలో వక్తలు లేవనెత్తిన సమస్యలను సారాంశం చేయమని EE, TSPCB ని అభ్యర్థించారు.

ఎన్విరాన్మెంటల్ ఇంజినీర్, టి.ఎస్.పి.సి.బి. వారు, ఈ ప్రజాభిప్రాయ సేకరణ సభలో మొత్తం 36 మంది సభ్యులు (శ్రీ ఎం. సత్తి రెడ్డి, SE (రిటైర్డ్), ఇరిగేషన్ మరియు CAD డిపార్ట్‌మెంట్‌తో ప్రారంభించి, శ్రీ అన్నాకారం శ్రీశైలం ద్వారా ముగించారు) తమ అభిప్రాయాలను తెలియజేసినట్లు సమాచారం అందించారు మరియు వారిలో ఎక్కువ మంది ప్రాజెక్ట్‌కు మద్దతు ఇచ్చారు. ఈ ప్రాజెక్ట్ పై సుమారు 19 మంది ప్రతినిధులు ప్రాతినిధ్య విన్నపాలను అందచేశారని తెలిపారు. అన్ని ప్రాతినిధ్యాలు, ఆడియో మరియు వీడియో యొక్క కాపీలతోపాటుగా ప్రజాభిప్రాయ సేకరణ సభ యొక్క సమావేశ అంశాలను తదుపరి చర్య తీసుకోవడం కోరకు పర్యావరణ, అడవులు మరియు వాతావరణ మార్పు మంత్రిత్వ శాఖకు పంపబడుతుందని తెలిపారు.

వికారాబాద్ జిల్లా కలెక్టర్ గారు తమ ముగింపు కార్యక్రమంలో ప్రజాప్రతినిధులకు, అధికారులకు, ప్రజలకు, రైతులకు, పర్యావరణ మరియు ఇతర భూసమస్యలపై తమ

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అభిప్రాయాలను వ్యక్తం చేసినందుకు కృతజ్ఞతలు తెలిపారు. ఈ బహిరంగ విచారణను సజావుగా నిర్వహించినందుకు ప్రింట్ మరియు ఎలక్ట్రానిక్ మీడియా మరియు జిల్లా అధికారులకు ఆమె కృతజ్ఞతలు తెలిపారు. సభ యొక్క సమాహిత అంశాలు నమోదు చేయబడి ప్రాతిపూర్వక ప్రాతినిధ్యాలతో పాటు పర్యావరణ, అడవులు మరియు వాతావరణ మార్పు మంత్రిత్వ శాఖకు పంపబడతాయని ఆమె పేర్కొంటూ సభను ముగించారు.

ప్రజాభిప్రాయ సేకరణ సభ ముగించబడినది.

ప్రజాభిప్రాయ సేకరణ సభకు సంబంధించి అందుకున్న ప్రాతినిధ్యాలను అనుబంధం-I గా జత చేయబడినది.

ప్రజాభిప్రాయ సేకరణ సభలో పాల్గొన్న ప్రజల హాజరు జాబితాను అనుబంధం-2 గా జత చేయబడినది.

శ్రీ పి. సుధీర్ బాబు
పర్యావరణ ఇంజినీర్,
తెలంగాణ రాష్ట్ర కాలుష్య నియంత్రణ మండలి,
ప్రాంతీయ కార్యాలయం-1, సంగారెడ్డి.

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శ్రీమతి. పౌసుమి బసు, ఐ.ఎ.ఎస్.
జిల్లా కలెక్టర్ మరియు జిల్లా మేజిస్ట్రేట్,
వికారాబాద్ జిల్లా

MINUTES OF THE ENVIRONMENTAL PUBLIC HEARING HELD FOR THE PALAMURU RANGAREDDY LIFT IRRIGATION SCHEME (PRLIS) PHASE-II PROPOSED BY IRRIGATION & CAD DEPARTMENT, GOVERNMENT OF TELANGANA AT BRUNDAVAN GARDEN, KODANGAL ROAD, PARIGI, VIKARABAD DISTRICT ON 10.08.2021 AT 11.00 AM.

The following Public Hearing panel members were present:

S. No.	Name of the Panel Member	Designation
1.	Smt Pausumi Basu, IAS, Collector & District Magistrate, Vikarabad District	District Collector & District Magistrate, Vikarabad District
2.	Sri P. Suresh Babu, Environmental Engineer, Telangana State Pollution Control Board, Regional Office-I, Sangareddy.	Representative of the T.S. Pollution Control Board

The following representatives of Irrigation & CAD Department, Government of Telangana and Other Officials were present:

S. No.	Name & Designation
1.	Sri K. Srinivas, SE, Irrigation & CAD Department, Mahabubnagar.
2	Sri S. Motilal, Addl. District Collector & Addl. District Magistrate, Vikarabad District.
3	Sri K.V. Upender Reddy, RDO, Vikarabad District

At the outset, the Environmental Engineer, Regional Office, Sangareddy District, TSPCB, invited the people gathered at the venue and public representatives and other officials to the environmental public hearing held for the Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) proposed by Irrigation & CAD Department, Government of Telangana at Brundavan Garden, Kodangal Road, Parigi, Vikarabad District. He invited the District Collector, Vikarabad District to occupy the dais and conduct the public hearing in accordance with the procedure laid down in the Environment Impact Assessment Notification (EIA), 2006 issued by the Ministry of Environment, Forests and Climate Change, Government of India. While explaining the salient features of the EIA Notification, 2006 S. O. (E) No.1533, dated 14-09-2006 and its subsequent amendments issued from time to time, he stated that the public hearing was a mandatory process for Palamuru Rangareddy Lift Irrigation Scheme (PRLIS).

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He also stated that the intimation of public hearing was published in 'Namesthe Telangana', Telugu Newspaper and in 'Telangana Today' English Newspaper on 10.07.2021. The draft EIA report along with Executive Summaries in Telugu and English on the project was displayed at the offices of the local bodies and the Collectorate to enable the people to access the information. The environmental public hearing is being held to elicit the views, opinion, suggestions and objections if any on the proposed project. He also informed that the entire proceedings would be video graphed for sending the same to the higher authorities for taking further action. There would be no final verdict on the proposal except furnishing clarifications on the issues related to environment during this public hearing. He then requested the Collector, Vikarabad District to conduct the proceedings of Public hearing.

The District Collector & District Magistrate, Vikarabad District while inviting the people gathered at the venue, requested them to follow the rules of the meeting. She stated that the public hearing was a mandatory process for obtaining Environmental Clearances for the Palamuru Rangareddy Lift Irrigation Scheme (PRLIS) and people can freely elicit their views, opinion, suggestions and objections if any on the proposed project. She also requested the people who intended to offer their opinion to send their names with their villages on a paper slip and written representations would also be entertained from the persons depending on their choice. She requested the people to utilize the time judiciously and stated that the entire proceedings of the environmental public hearing would be video graphed. She then requested SE, Irrigation & CAD Department to explain the salient features of the proposed project and presentation on draft EIA report by representative of Environmental Consultant.

Sri K. Srinivas, SE, Irrigation & CAD Department, Mahabubnagar: After customary welcome address to all the public representatives, the District Collector, other Officers and people present at the venue, he explained the project details as follows:

- PRLIS is intended to supply clean potable water to the upland and water scarce areas of six drought prone districts namely:-Mahabubnagar, Nagarkurnool, Rangareddy, Vikarabad, Narayanpet and Nalgonda.
- Percentage of cultivable areas in the above districts are lesser compared to the total geographical areas in these districts.
- To overcome this problem, Government proposed to lift 90 TMC ft of water over a period of 60 days during the flood season from the foreshore of Srisailam Reservoir

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on Krishna River through 5 stages and 6 reservoirs by providing irrigation to 12,30,000 acres of land in 1226 villages of 70 mandals of 6 districts, apart from providing drinking water to people and to meet the needs of industries.

- The project will be taken up in two phases. 1st Phase for drinking water and in 2nd Phase consisted of irrigation water and industrial needs.
- The project extends 417 villages of 18 mandals in Vikarabad District. Water will be supplied from Udandapur and K.P. Lakshmidevipally reservoirs.
- Udandapur reservoir supplies water to 2,44,410 acres of land and K. P. Lakshmidevipalli reservoir supplies water to 97,542 acres. The land to be acquired is about 9830 acres for construction of ayakut canals.
- This project on completion helps to improve ground water table, increase in area of cultivation, enhanced socio-economic conditions of the people and increase in fishery, animal husbandry resulting in increased productivity of dairy products, improvement of infrastructure facilities, enhanced entertainment and tourism sectors.

PROJECT BACKGROUND:

- Situated in the southern part of India, Telangana is the 29th state of India, formed on 2nd June 2014 with 1,12,077 Sq. km. of area and has a population of over 35 million. Forests occupy 24% of area, and about 43% of land is under cultivation.
- Ground water contributes to 75% of irrigation, while only 25% of irrigation supported by surface water supply.
- Drainage of the state can be divided into 2 major and 11 sub-basins; Godavari and Krishna are major rivers in the state, with around 73.5% of state's territory being covered by basin of these two rivers. Whereas, the proposed irrigation project will cover watershed of Krishna River basin.
- According to the agro-climatic zones, this region falls under the southern plateau and hills regions and is classified as hot semi-arid eco-region.
- The agricultural statistics for 2015-16 indicate that Nalgonda, Mahbubnagar, and Rangareddy districts are susceptible to droughts in Telangana. There is tremendous shortage of drinking water, as these are fluoride affected areas.

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- To redress this situation, the Government of Telangana have taken up the Palamuru Ranagareddy Lift Irrigation Scheme for alleviating the misery of these drought prone areas which will benefit 70 Mandals in 6 districts with 1226 villages where about 50 lakh people would be benefitted with safe drinking water.
- The Terms of Reference (TOR) was issued vide no. J-12011/31//2017-IA-I (R), dated 11.10.2017 and it is valid upta 10th of October, 2021.
- The Project Proponent of PRLIS, Irrigation and CAD Department, Govt. of Telangana, through C.E. awarded the work of EIA-EMP studies to Voyants Solutions Pvt. Ltd., Gurugram, for conducting the studies through online Tendering process.
- Previous Baseline Monitoring was conducted in Monsoon, Post-Monsoon, 2017 and Pre-monsoon, 2018.
- In compliance of provision under para 7(i) and para 2.2 of Annexure – IV to the EIA Notification, 14th September, 2006, the project proponent, submitted the draft EIA-EMP report along with executive summary to Telangana Pollution Control Board.
- Again Baseline Monitoring process was conducted in Project impact and study area during Monsoon and Post-Monsoon, 2019 and Pre-monsoon, 2020. Public Hearing process has been scheduled on 10th August, 2021.
- The Environmental Consultant for this project is M/s. Voyants Solutions Pvt., Ltd and they have accreditation from QCI-NABET.
- The Project has 2 Phases; Phase I: Drinking Water Supply Phase II: Irrigation.
- Water Source is from excess flood water of monsoon season from fore-shore of the Srisailam Reservoir.
- Drinking Water Coverage has five Distrits viz., Mahabubnagar, Nagarkurnool, Nalgonda, Narayanpet, Vikarabad, Rangareddy district and Hyderabad city.
- Irrigation Coverage has 1226 villages, 70 mandals in 6 districts (Mahabubnagar, Nagarkurnool, Nalgonda, Narayanpet, Vikarabad, Rangareddy); Command Area: 4,97,976 Ha.; Length: 915.47 Km.
- Stages of Supply is from 6 Balancing reservoir in Anjanagiri, Veeranjaneya, Venkatadri, Kurumurthyraya, Udandapur and Lakshmidevipalli; 5 stages of lifting and followed by utilization by gravity flow.

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- The project has Water Storage/Capacity of 90 TMC (82.52 TMC for Irrigation, 7.15 TMC for Drinking water supply and 0.33 TMC for Industrial Use. The Budget of the project is Rs. 52,056.31 cr and BC ratio is 1.25:1.
- Shown the schematic diagram of the project showing various reservoirs. Water would be lifted through series of pumping stations from the foreshore of Srisailam reservoir located at a level of 244.4 m to Narlapur; to Yedula; to Vottem; to Tarveda to Udandapur to K. P. Lakshmidevipally located at a level of 670 m.
- Total canals of the project are 13 Nos. from 6 reservoirs with a length of 917 KM and ayakut of 4,96,976 ha.
- Mandal wise ayakut details in acres in Vikarabad District is as follows:
- Bomraspet (Villages:25 & ayakut: 30587), Kodangal (Villages:13 & ayakut: 21524), Doulthabad (Villages:16 & ayakut:11640), (Villages: Doma 26 & ayakut: 16643), Kulkacherla (Villages: 13 & ayakut: 9005, Parigi (Villages: 29 & ayakut: 20137), Pudur (Villages: 23 & ayakut: 17095), Dharur (Villages: 34 & ayakut: 24834), Kotipally (Villages: 18 & ayakut: 14211), Bantwaram (Villages: 10 & ayakut: 6177), Vikarabad (Villages: 31 & ayakut: 16656), Mominpet (Villages: 21 & ayakut: 20851), Marpalle (Villages: 25 & ayakut: 16468), Basheerabad (Villages: 30 & ayakut: 34669), Peddemul (Villages: 17 & ayakut: 12534), Yelal 32 & ayakut: 26432), Tandur (Villages: 34 & ayakut: 24837), Nawabpet (Villages: 20 & ayakut: 17652); Total No of Mandals covered is 18; Total No of Villages covered is 417; Total area of ayacut in acres in Vikarabad District is 3,41,952.

Sri Gaurab Bandopadyaya, representative of M/s. Voyants Solutions Private Limited, New Delhi (Environmental Consultant): After customary welcome address to the chair and people present at the venue of the hearing, he explained the following environmental details consisting of parameters, predicted impacts and mitigation measures as detailed below:

- Baseline studies were carried out during monsoon of 2019, post-monsoon 2019 and Pre-monsoon 2020 at 6 locations in the project area.
- The parameters monitored are Ambient Air Quality; Ambient Noise Quality; Soil Quality; Ground Water Quality and Surface Water Quality.

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- Micro-climate: Short Term effect on temperature and humidity due to construction work during construction phase and there will be no effect during Operation Phase. Controlled construction process needed.
- Land-use: Agricultural/non-agricultural land will be permanently changed to Water body. Improved and planned land-use development through planning will reduce the impact.
- Soil Quality: Medium impact on soil erosion, due to blasting, excavation of work during construction and no major impact during operational phase. Adoption of staggered operations along the canal alignment. The top soil will be retained and used for bunding and greenbelt development as part of mitigation measure.
- Air Environment: Possibility of medium to high Dust Pollution during construction phase and there will be no major Impact during operation phase. Suggested to undertake controlled operations with regular maintenance of roads. Regular pollution monitoring is required.
- Impacts on Noise: Possibility of medium to high noise pollution during construction period. However no major Impacts anticipated during operational phase. Suggested for raising of multiple row plantations to serve as acoustic noise barrier.
- Impacts due to Blasting: Air pressure will be increased due to blasting and anticipated range of noise will be in the range of 103.2 -109.8 dB(A) respectively and within stipulated 120 dB(A). Controlled and planned blasting as per the Geological planning and blasting will not be undertaken within 300 m of settlements and habitations. To reduce any adverse impact it is suggested to follow approved blasting plan for undertaking tunneling and other major works.
- Water Environment: Possibility of increase of solid and silt concentration in river water. There is a possibility of water Logging in certain pockets due to land terrain and its geography. As a mitigation measure it is suggested to undertake controlled excavation in canal system and adoption of restricted excavation during monsoon season to avoid water logging.
- Geology: Only localized and low impacts are anticipated. Suggested to take up controlled and planned blasting according the geological status of the area.

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- Hydrology: Anticipated net ground water recharge is 970.24 MCM. Suggested regular monitoring to prevent the uncontrolled seepage in certain pockets resulting in accidental discharge into canals.
- Flora: There are no vulnerable or endangered species in the vicinity of project area. Suggested to raise avenue and multiple row plantations along the canal bunds and entire canal network area. Compensatory afforestation shall be taken up as part of setting up of camps in forest areas during construction phase.
- Fauna: As there is no alteration to the existing habitat of endangered and threatened species due to construction of project. However, it is suggested to undertake controlled construction near forest areas to avoid disturbance to the natural setting of the forest areas in the vicinity.
- Socio-economic Condition: There will be improvement in income levels due to irrigation and cropping intensity due to regular water supply. Project will improve socio-economic condition of the area and people will get sustained and regular income.
- Environment Management Plan: Proposed to spend Rs.1744 crores on maintenance of environment and ecology. The main components are Command Area Development, Resettlement and Rehabilitation Plan, Greenbelt Development Plan, Solid Waste Disposal, Projected Environment Monitoring cost will be Rs.228 lakhs.
- Acquisition of Land: Compensation to the land will be paid as per the RECT LAAR Act 2013. The compensation will be paid depending on the market value and multiplication factor will be maximum 2 in rural areas and 1 in case of urban areas.
- Solatium: Solatium will be paid based on market value and with multiplication factor on the market value and value of assets attached to the land put together.
- The number of project affected families are 3670 and patta land to be acquired for main and distributaries will be 3978 Ha.
- The estimated cost of under R&R will be Rs.1566.86 crores.

The District Collector, Vikarabad, stated that the officials of the Irrigation Department explained the silent features of the project. She requested the public to offer their views, suggestions and opinion one by one as per the slips received from the public.

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1. **Sri M. Satti Reddy, SE (Retd.), Irrigation and CAD Department**: After customary welcome address, he stated that he worked long back on various irrigation projects before his retirement. Now all such irrigated areas are prosperous and people are leading comfortable life, he cited. He stated that environmental clearance was a necessary pre-requisite for construction of projects and requested the people to offer their views in support of the project which would be beneficial to the people. He stated that due to construction of this project the Vikarabad District will be benefitted not only due to direct irrigation of lands but also due to increase in ground water levels. With surplus electricity available at present, the farmers of this area would be able to grow crops due to increased ground water availability. He advised the farmers to go for cash crops such as flowers, fruits and horticulture crops instead of water intensive paddy crop. He opined that there would be no adverse impact on environment unlike chemical or other polluting industries.

2. **Sri B. Praveen Kumar Reddy, r/o. Chiguranpally:** He supported the project wholeheartedly and felt that this day would be remembered as golden letter day in the history of Vikarabad. He thanked the authority for providing drinking water to the people of Parigi who were aspiring for this project. He stated that water is chief ingredient for socio-economic development of the area as this project supply water to the irrigation and drinking water purpose. Now this area is rain fed and water supply is depended on supply of electricity and motors. He asserted that the problem would be solved after commissioning the project. He fervently requested the authorities to permit the drawl of water through motors to the fields located adjacent to the canal and those could not be irrigated through gravity. He thanked the Government for launching this type of project to benefit the people of this area. He sought justice to the land loosers and requested the authorities to pay compensation three times to the market rate. Compensation was paid only to the land owners, but 2013 LA Act provided compensation to the land dependents also. He sought compensation to the landless labour, small time traders and lease holders at the rate of Rs.5.0 lakhs per acre as provided in the Act. He felt that SC, ST farmers were cultivating assigned lands and Government tend to resume the lands. He opined that compensation should be paid on par with patta lands in case of assigned lands also as envisaged in the latest Act. He stated that 30% persons cultivating assigned lands could not secure pattadar passbooks so far. He raised the issues cropped up in the case of other

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projects and advised the authorities to take necessary action to prevent repetition of legal problems. He finally requested adequate compensation to the trees and other properties acquired before launching the project.

3. **Sri K. Aravind Rao, r/o. Rangapur:** While extending his full support to the project, he hoped that the proposed project would provide irrigation water 20,000-30,000 acres of land in each mandal. Vikarabad District being rainfed one remained as a backward district. He cited the example of Palamur District where, people became prosperous after getting irrigation water to their land. He stated that large chunks of Government land is lying vacant due to non-availability of water in this district which is dependent on mansoon. He informed that the farmers in this region reaped good harvest last year due to good mansoon. He hoped that they would be able to grow two crops on completion of this project and also solve the ground water problem. He supported the proposed project.

4. **Sri M Venkataiah, r/o. Parigi:** He thanked the Government for proposing lift irrigation project. He informed that they don't have any objection for the proposed project. However, he requested the irrigation officers to construct the reservoirs in such a way that there will not be any affect of the earth quakes on the reservoirs. He informed that many acres of land will be cultivated. He further expressed his views with regard to land acquisition, he stated that in the name of development, there should not be any forced land acquisition should be takes place. The officers shall follow the rules and give three times of market value under the compensation to the farmers who are loosing their lands for the proposed project. He further pointed out that as per LARR Act, the compensation shall also the extended to the people who are not having lands, lease farmers. The equal compensation shall also be extended to the assigned lands of SC, ST people. He further pointed out that many farmers have not received their new passbooks under the New Dharani Portal introduced by the Govt. of Telangana, those farmers shall also get compensation without insisting new passbooks. Earlier, he informed that in the similar case i.e., in Kaleswaram project the Mallanna Sagar affected people have not got compensation till not. The officers shall calculate the value of all the materials existing in the land and give compensation including those materials. He requested to complete the project in time.

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The District Collector at that stage appealed again to the participants and aspirant speakers to limit narrations/ opinion to the issues related to environment only and their views should be brief and crisp without wasting time on repetition of the issues and they should not dwell on the matters not connected to the environment.

5. **Sri Ziauddin Ahmed, SE (Retd), Kaleshwaram Project:** After customary address to the chair and others, he felt that EIA process should be applied to the drugs and chemical factories, but not to the irrigation projects as there would be least disturbance to the environment and act as a supplement for enhancement of environmental status. The environmental engineers were constrained to follow the complicated procedure in every case that required environmental clearance. He narrated his experience as JE in this area regarding provision of irrigation to 6,000 acres of land, whereas it became a project of 4,00,000 acres now. He stated that water would definitely enhance the status of environment, which would otherwise result in 'health is wealth'. Vikarabad and Pargi offered best environment in entire Telangana State and provision of adequate water to this area would enhance its status further due to further improvement in the quality of environment. He also pointed out that the area was benefitted multifold as there would be coverage of ayacut area in this district and the acquisition of land would be limited to the excavation of canals only as no reservoir was planned in this area. He requested the people to be liberal while giving away their lands under acquisition for canals to bring water to Pargi town. This step would help in the setting up of food processing industries and also tourism sector and Pargi would become a preferred destination for healthy living place due to availability of sufficient water. He felt that the people in this area were not sufficiently educated and they were not getting minimum price for their agriculture produce. He cited the example of selling raw maize to the selling of same by converting into popcorn. He concluded his speech by citing Mulakanoor Cooperative Society where the joint and dedicated effort of the people brought riches to their farm products. He exhorted the people to follow the same path and benefit from the proposed project by selling value added products.

The District Collector appealed again to the public to limit their views to the environment part only.

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6. **Sri Mukunda Nageshwar, r/o. Parigi:** He felt happier and expressed his gratitude to the Government for taking a decision to extend water supply project to this area. He stated that though there was 14 lakhs acres of available arable land in the undivided RR district, irrigation facilities was extended to 1.5 lakhs acres only. People fervently hoped to benefit from Pranahita Chevella Irrigation Scheme to an extent of 5.5 lakhs acres, but the extent of coverage was limited to Medak District only. Now this project is expected to provide irrigation to 3.2 lakh acres in the district. He sought lifting of water from the Jurala project which was located at higher reaches instead Srisailam back water as there would be no dispute with any other state. He wanted the Government to preserve the traditions and customs of the villages where project work would be undertaken. He wanted land to land and house to house compensation to prevent any loss to the property loosers in this project. He opined that solar panels should be erected on the canals passing through the farmer by transferring the benefit to the farmers from the power generated by such solar systems. He sought adequate compensation at least on par with the Kaleshwaram project to the loosers of land.

At this stage the District Collector, Vikarabad made an appeal for brevity in the speeches.

7. **Sri S. Sudhakar Reddy, r/o. Malkapoor:** He pointed out that water to the Vikarabad District would be supplied from Udandapur reservoir. His main contention was that the nearest village of Kulkacherla Mandal to the Udandapur reservoir was about 10 Km and some villages were not getting supply of water based on his information. He suggested that water should be taken from Kobath village of Narmed Mandal to Chowdapur village from where water flows down to east naturally. He therefore requested to realign the canal to facilitate the coverage of more areas which were hitherto not supplied with water.

8. **Sri. N. Jagan, R/o. Raghavpur Village:** He informed that, since many years they are waiting for this project, now their dream has come true. He has given example of Mission Bhagiratha in which drinking water was supplied to Pargi, Kodangal and Tandur towns from Raghavpur station. He further informed that, due to Mission Bhagiratha station located at Raghavpur, the ground water increased in their village. Due to the small project the ground water increased from 500ft to 80ft, so the present project will increase the

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ground water levels enormously, by using ground water another 3 lakh acres of land can be cultivated.

9. **Smt. Satyaharichandra, MPP, Kulkacherla:** She welcomed the gathering and expressed his happiness for the proposed project. She informed that, they are waiting for this project since 30-40 years. In their village the ground water was depleted, due the proposed project the ground water will be increases. She further informed that Vikarabad is a backward district and required this type of projects for development of the District.

10. **Sri G. Srinivas, EE (Retired) (Kalwakurthy lift irrigation project, Koyalsagar and PRLIS):** He informed that he is very happy today that the PRLIS has started. He stated that he belongs to Mahabubnagar, South-Telangana where the rainfall is very low i.e., 70 mm to 80 mm only. He has seen every two years drought in the last 30 years. The farmers are forced to cultivate only one crop depending on the ground water. Many farmers migrated and forced to work as coolies. He informed that after formation of Telangana, the Government has concentrated on irrigation projects. Many projects has been taken up, the PRLIS is one of them. He explained about the technical issues for not drawing water from Jurala Reservoir, the Jurala Reservoir is having 9 TMC capacity only. The PRLIS proposed to draw 90 TMC of water (1.5 TMC on every day) for 60 days. Hence, the Srisailam Reservoir is the better option as the capacity of the Srisailam Reservoir is 250 TMC. He informed that the Vikarabad District will get water for irrigation of 3,41,000 Acres in 18 Mandals. He stated that the environmental clearance is mandatory for this project further today's public hearing is conducting. He expressed his happiness as every one is supporting this project. The Vikarabad is very near to the Hyderabad, farmers can go for commercial crops like vegetables & fruits and their can increase their economy. He further informed that the ground water also increases and the farmers can also draw water from the borewells.

11. **Sri K. Raji Reddy, Sarpanch, Doma:** He formerly welcomed the gathering and informed that in their mandal 10 gram panchayats are not getting water from the proposed project. Total 20,000 acres exist in their mandal, till now no irrigation canals are existing. He is very happy today they are going to get canals and the farmers are very happy to

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give lands for the project. He requested the irrigation officials to change the design of the project in such a way that all the villages in their mandal shall be covered.

At this stage the District Collector, Vikarabad made an appeal for brevity in the speeches and follow the COVID protocol.

12. **Sri Kotla Yadagiri, R/o. Bomraspet Village:** He welcomed the project and informed that in 2015 the Hon'ble CM promised to supply the water for drinking and irrigation purpose. Now in 2021, the project has started. He requested the officials to complete the project within time so that, the area will be developed. He has given an example of difficulty of drawing of water from the mota bavi by their ancestors. He informed that due to mission bhagiradha they are getting drinking water. He pointed out that this project is very much required for the development of the district. He informed that the then Mahabubnagar district is known as labour district. Due to this project migration of the farmers will be decreased, future generation will be educated. He requested the irrigation officials to change the design of the project in such a way that all the villages shall be covered under this project. He thanked the Hon'ble CM. He further informed that some of the people may lose the lands but many will get benefited. He requested the irrigation officials to complete the project within time as in the similar case of Kalaeswaram Project.

13. **Sri Mallesam, R/o. Kankal (V), Pudur Mandal :** He stated that Mahabubnagar, Rangareddy and Nalgonda district are very backward districts. The Hon'ble CM has given assurance that the Government will supply the water to these districts. Accordingly, the proposed project has materialized. The Mahabubnagar district is known as labour district and many farmers were migrated to Mumbai & Pune for surviving. The farmer has to dig the borewell upto a 1000ft to get the ground water. He expresses his sincere thanks to Hon'ble CM. He informed that all the farmers will grow paddy and other crops happily. There may be loss to some family but many families will be benefitted. He requested the Government to protect the families who are losing lands. He further informed that after 70 years , their dreams has come to true. He pointed out that they can lead happy life in their village only. Their children may not required to go for America, they can develop this area. He requested the irrigation officials to complete the project within time as in the similar case of Kalaeswaram Project.

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Regional Office-I, SANGAREDDY

14. **Sri Venkataramakrishna Reddy, R/o. Sayadpally:** He welcomed the project and informed that he is a farmer used to depend on the rainfall to cultivate the crops. The Vikarabad district is having very low rainfall and low ground water. Now they are going to get enough water for irrigation and expressed their happiness and requested to complete the project within time.

15. **Sri Mohammed Jaffer, R/o. Sayadpally:** He welcomed the project and congratulated all the villagers. He informed that they are waiting for many years for this project. However, he is not sure about the exact location of the proposed canals in Laxmidevarapally and how much water is supplied. They are very happy and supporting the project.

16. **Sri T.Venkatesh, R/o. Pargi, Member of Fisheries Society:** He welcomed the project and very happy as they are going to get livelihood by increasing the fisheries. There are 300 families are depending on the fisheries in their village. All the families get benefitted from this project, thousands of acres land cultivated.

17. **Sri J. Shankar, Sanpanch, Dasamia Thanda, Kulkacherla Mandal:** He welcomed the project and informed that they are many thandas is existing in Vikarabad District. He informed that many farmers get benefitted with this project. He further stated that many kuntas are encroached and requested to remove the encroachments and fill with water so that the ground water will be increased.

18. **Sri K.Hanumanth Mudiraj, DCC President, Pargi:** He informed that till now no irrigation project is existing in this area, because of low rainfalls many farmers are depending on the private financiers and not in a position to repay the credits. The proposed project brings enough water for irrigation. He informed that the project is already become late and requested the Government to complete immediately. He requested the Government to compensate the losers by giving land to land, home to home and job to everyone. The compensation should as equal as market price. He further informed that irrigation projects are required in these areas but the Hon'ble CM is concentrating in north Telangana. He requested the irrigation staff to explore the possibility of drawing of water from Jurala Reservoir as it is located near as it compared to the Srisailam Reservoir. He stated that the Central Government has not recognized the

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T.S. Pollution Control Board,
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Laxmidevipally project, hence the Government shall look into the matter. He highlighted the need of irrigation projects in south Telangana. The water and power are essential for the development of the project. The compensation shall be given as per the rule.

19. **Sri Ramdas Naik, R/o. Kulakacherla Mandal:** He informed that they are waiting for many years to get this project. He stated that the farmers of neighbouring states are cultivating two crops every year, but Vikarabad farmers are not having water to cultivate even for single crop. The farmers are forced to spent lakhs of rupees on the borewells to get the water. In this situation, the proposed project is very much useful. Since 70 years of independence no Government has taken initiation to bring this type of irrigation projects to this area. He expressed his sincere thanks to the Hon'ble CM. He informed that Vikarabad is a backward district and many migrations were took place for surviving. Now, the migrations will be decreased.

20. **Sri V.Ravindra, R/o. Pargi:** He welcomed the project and stated that the public hearing is the forum to discuss the environmental issues only and the environment will be improved by the proposed project. Many people were migrated to cities and forced to work as labours. Now, the migration will decrease. The project also increases animal husbandry, different types of plants will be developed. He informed that tourism, fisheries will be developed. Everyone is happy with this project.

21. **Sri. B.Ravi Kumar, R/o. Pargi:** He welcomed the project and stated that the public hearing is the forum to discuss the environmental issues only. He informed that their long pending dream has come true. They are very happy that the farmers are going to get water for cultivation. He extended his support for the project and informed the employment, industries will come up in this area.

22. **Sri. Phir Mohammed, R/o. Narayanpur:** He welcomed the project and highlighted the Kaleswaram Project benefits, the Karimnagar has developed because of Kaleswaram Irrigation Project. He informed that due to the proposed irrigation project the farmer can cultivate 3 crops in a year. He stressed for the compensation to the farmers who are losing lands. He stated that many court cases were filed due to not implementation of compensation in Mallanasagar project and requested the Government not to repeat such

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type of things. He informed that enough water will come for the irrigation purpose. No one can oppose this project and everyone should support.

23. **Sri P.Anjalaiah, R/o Chellapur:** He welcomed the project and informed that the villagers have already discussed and decided to support this project. They are very happy as they are going to get enough water for agriculture.

24. **Sri M.Rajender, R/o. Naskal:** He formally welcome the gathering for the proposed project public hearing. He expressed his happiness towards the proposed project. He informed that our leaders had fought many years to get this irrigation project. This government has taken many policies like 24 hours power supply, irrigation projects. He informed that the farmers are happy and their long pending dream has come true. He requested everyone to support this project has every farmer is getting enough water for agriculture. The ground water will be increase because of irrigation projects. He requested the Government to concentrate on small check dams, rainwater harvesting pits which will increase the ground water and local water bodies shall be filled with water.

25. **Sri M. Nagaraju, R/o. Mandipal, Kulkacherla:** He informed he has seen many forums in other areas and very happy to see the proposed irrigation project in his own area. He pinpointed the importance of water for everyone. He stated that the Pargi area is like a desert compared to other areas and proposed canals will increase the ground water. He expressed his sincere thanks to Hon'ble CM and engineers. He told that this area is very dry and lack of water many farmers were migrated and many suicides were taken place due to financial problems. This project may bring development to this area and extended his support for the project. He requested to complete the project within time.

26. **Sri S.Jangaiah, R/o. Kaalapur (V):** He expressed his happiness and informed that the farmers are happy with this proposed project. He stated that not only human beings are happy but also the plants & animals. The ground water will be increased, the pure oxygen will get from trees. He highlighted that our ancestors use to live upto 80 years because of good environment, due to the cutting of trees oxygen is decreased, due to the chemical food the present health of the human beings are affected. The drinking water scarcity will be reduced. The farmers can cultivate more crops by using water from the

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proposed project. He requested the Government to give land to land, home to home to the farmers who will lose their lands instead of giving cash.

27. **Sri Govind Naik, R/o. Dipsampally Thanda, Doma Mandal:** He welcomed the project and requested the Government not to give permission for stone & sand mining activities. He informed that many years dream came true and thank the Government. He stated that 12 Grampanchayats in Doma Mandal are not covered in this project and requested to supply the water to these gram panchayats also.

28. **Sri V. Manohar Reddy, DCCP Chair Person, Tirumalpur (V), Kulkacherla (M):** He formally welcomed the gathering for the proposed irrigation project public hearing. He informed that since many years farmers are facing lot of problems in agriculture due to lack of water. The Government has taken good decisions by bringing irrigation projects. Long pending dream has become true and thank the Government. He stated that Kulkacherla Mandal is having more number of migrants. He requested the irrigation officials to explore the possibility of giving water to all the villages under Kulkacherla Mandal. He highlighted the benefits of the projects like development of tourism, industries. Hence, everyone should support the project.

29. **Sri K.Venkatram Reddy, R/o. Sultanpur (V):** He welcomed the project and highlighted the importance of water, oxygen and food for every living being. Out of these, water is the main important for everyone. He expressed happiness towards the proposed project. He stated that there will not be any damage to the environment. He highlighted about the control blasting to maintain the noise levels within the standards. Due to the proposed project some of the farmers will lose their lands and Government shall give compensation to them.

30. **Sri E.Kondaiah, R/o. Salweed (V), Kulkacherla (M):** He formally welcomed the gathering for the proposed irrigation project for the public hearing. He stated that many projects have come in northern Telangana, but very few projects are proposed in southern Telangana. After long time our dream has come true. He highlighted the benefits of Mission Bhagiratha Project. He also mentioned that the animals and birds are beneficiated by the proposed project. He requested the officials to cover all the villagers in Kulkacherla Mandal and shall complete the project within time.

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31. **Sri E.Raghavender Goud, R/o. Ghanapur (V), Kulkacherla (M):** He informed that many farmers from tandas are migrating to cities and forced to work as labours as there is no water source in all the tandas located in Vikarabad district. He requested the officials bring Jurala water as it is less distance compare to Srisailam Reservoir. He expressed happiness for the proposed project.

32. **Sri T.Nagavardhan, R/o. Rapole:** He stated that water is very important element for everyone and long pending dream has become true after 70 years of independence. He requested the Government to complete the project immediately as it is already too late. The farmer is very important to the country. Presently, getting of one crop is very difficult due to lack of water sources. Most of the families are depend on agriculture. Many suicides were taken place due to financial problems and forced to migrate. He also informed that some of the farmers are having doubts of losing their lands, the Government give compensation to them.

33. **Sri S. Janardhan Reddy, Sarpanch:** He extended his support for the proposed project and requested not to oppose any one. He stated that some of the farmers may lose lands but many farmers will get water and benefitted. He also highlighted the problems faced by the farmers in this area in agriculture due to insufficient water sources. He expressed his sincere thanks to the irrigation officers.

34. **Sri Parusuram Reddy, R/o. Sayedpally (V), Parigi (M):** He extended full support to the proposed project and informed that in 2008, the Hon'ble the then Chief Minister Dr. Y.S.Rajasekhar Reddy has inaugurated Pranahitha – Chevella, but till today they have not received water. He further informed that in 2011, the Hon'ble the then Chief Minister Sri Kiran Kumar Reddy has sanctioned PRLIS project but not started. He expressed doubts about the exact location of canals not known. He requested to give land to land, job to everyone and double room to families who are going to lose their lands as promised by our Hon'ble CM.

35. **Smt Haripriya, R/o. Pargi:** She extended her support for the proposed project and informed farmers will be benefitted by this project. She also suggested going for commercial crops like vegetables & fruits. She requested the Government to complete the project within the time.

Environmental Engineer,
T.S. Pollution Control Board,
Regional Office-I, SANGAREDDY.

36. **Sri Annasaram Srisailam, R/o. Bandacherla (V):** He stated that the proposed project will draw 90 TMC of water, 1 TMC of water is sufficient for 10,000 Acres. Hence, the Government shall explore the possibility of drawing of additional 5 to 10 TMC water so that all the lands can be cultivated. He also informed that 13 Gram Panchayats are not getting the water and requested to supply the water to those gram panchayats also. He expressed disappointment for not giving DPR to study and to know the exact areas where the canals are proposed and affected villages. He requested the Government to give land to land to every farmer who are going to lose their lands. He finally supported the project and very proud for this project.

The District Collector requested the SE, Irrigation & CAD Department to offer his response to the various issues raised by the public.

Sri K.Srinivasa Rao, SE, I&CAD Department sincerely expressed heartfelt thanks to all the speakers, everyone who supported the project and given assurance that the compensation will be given as per the Act / Rules to the farmers who are going to lose their lands. He also informed that no reservoirs are proposed in Vikarabad District. He further informed that they will consider each and every speaker suggestions and implement.

The District Collector requested the EE, TSPCB to summaries the issues raised by speakers during the public hearing.

Environmental Engineer, TSPCB informed stated that 36 speakers, (started with Sri M. Satti Reddy, SE (Retd), Irrigation and CAD Department and concluded by Sri Annasaram Srisailam) offered their views on the proposed project and most of them are supported the project. 19 written representations have been received on this project. The unedited video of the entire proceedings including the written representations and the minutes of the meeting would be sent to the MoEF&CC, GoI for taking further action.

The District Collector, Vikarabad District in his concluding remarks thanked the public representatives and other dignitaries including officials, farmers and public for offering their views on the issues related to environment and other land issues on the proposed Palamuru Rangareddy Lift Irrigation Scheme. She also

Environmental Engineer,
T.S. Pollution Control Board,
Regional Office-I, SANGAREDDY

thanked the print & electronic media and District Officials for smooth conduct of this public hearing. The entire proceedings of the meeting along with recorded video and written representations will be submitted to the MoEF&CC, New Delhi for further course of action.

The public hearing was concluded.

Representations received in this connection are enclosed herewith as Annexure-I.

List of the public participated in the public hearing is appended as Annexure-II.

P. Suresh Babu,
Environmental Engineer,
T.S. Pollution Control Board,
Regional Office-I, Sangareddy.

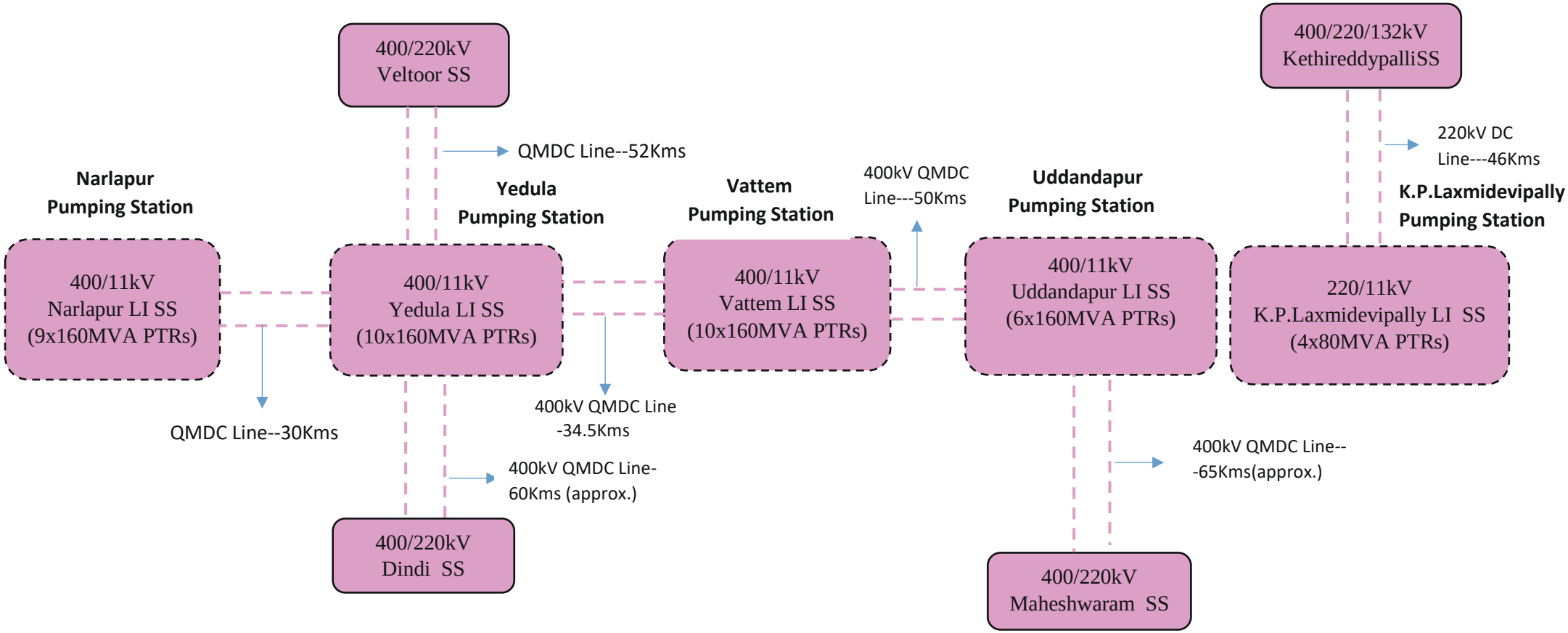
Environmental Engineer,
T.S. Pollution Control Board,
Regional Office-I, SANGAREDDY.

Smt Pausumi Basu, I.A.S.,
District Collector & District Magistrate,
Vikarabad District.

Annexure X

Power Linkage

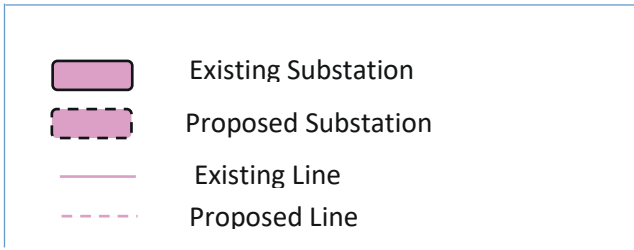
PALAMURU-RANGAREDDY LIFT IRRIGATION SCHEME(Revised)



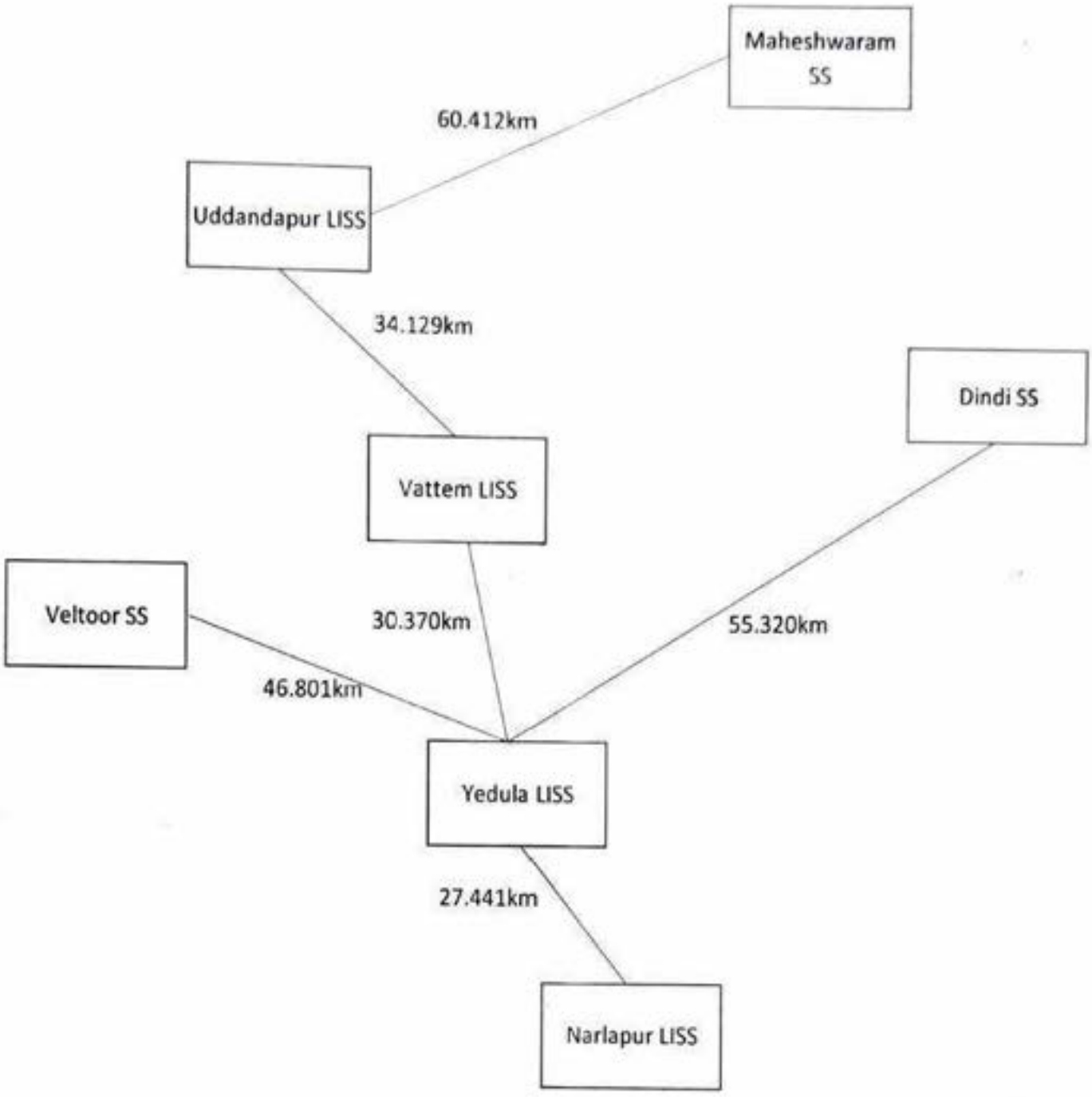
Note:

The PTR capacities at the LI substations are as follows:

1. 400/11kV Narlapur SS—9 Nosx165MVA+2Nos x25 MVA PTRs+1Nox125MVAR Reactor
2. 400/11kV Yedula SS--10 Nosx165MVA+2Nos x25 MVA PTRs+1Nox125MVARReactor
3. 400/11kV Vattem SS--10 Nosx165MVA+2Nosx25 MVA PTRs+1Nox125MVARReactor
4. 400/11kV Uddandapur SS--6 Nosx165MVA+2Nosx25 MVA PTRs+1Nox125MVARReactor
5. 220/11kV Laxmidevipally SS—4Nosx80MVA+2Nosx25MVA PTRs



Schematic diagram of 400kV Lines and Substations under PRLIS



Annexure XI

Hydrology

ANNEXURE "C"

ANNEXURE I GODAVARI

SUMMARY RECORD OF THE DISCUSSIONS OF THE MEETING HELD BETWEEN THE CHIEF MINISTERS OF KARNATAKA AND ANDHRA PRADESH AT BANGALORE ON 4TH AUGUST, 1978

The following were present :

Karnataka	*Andhra Pradesh*
1. Sri D.Devaraj Urs. Chief Minister.	1. Dr.M.Chenna Reddy, Chief Minister.
2. Sri N.Narasimha Rau, Chief Secretary.	2. Sri G.V.Sudhakara Rao, Irrigation Minister.
3. Sri J.C.Lynn, Secretary to Chief Minister.	3. Sri M.Gopalakrishnan, Secretary, Irrigation & Power.
4. Sri B.C.Angadi, Special Secretary, P.W.& E.dept.,(Irrigation).	4. Sri B.Gopalakrishna Murthy, Adviser, Irrigation & Power.
5. Sri S.R.S.Sastry, Chief Engineer, W.R.D.O.	5. Sri K.R.Chudamani, Adviser, Irrigation & Power.
6. Sri B.Subramanyam, Chief Engineer, Bangalore Water Supply & Sewerage Board.	6. Sri M.Satyanarayana Singh, Special Officer, Water Resources.

After discussion, the following points were agreed to :

Andhra Pradesh and Karnataka agree that Karnataka would, in addition to its existing utilisation above the proposed Singur project in the Manjra Sub-basin and the utilisation for Karanja and Chulkinala projects, as per the agreement of 17.9.1975 read with the agreement of 19.12.1975 utilise one TMC of water more for lift irrigation from the Manjra river.

2. In order to utilise this quantity or any other additional quantity that may be agreed to later, on the (133) Manjra, Karnataka may put up such pondage as may be necessary and as may be agreed to between Andhra Pradesh and Karnataka to utilise one TMC or such additional agreed quantities as may become available for this purpose.

3. Andhra Pradesh and Karnataka agree that Karnataka may utilise 2.5 (two point five) TMC of water in the Manjra sub-basin in its territory in the catchment below Nizamsagaar project.

4. Andhra Pradesh and Karnataka agree that Andhra Pradesh may go ahead with the construction of the Singur Project, as proposed by Andhra Pradesh, with the maximum capacity of 30 TMC of gross storage with FRL/MWL of plus 523.6 meters (1,717.41 ft.) above MSL.

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5. Karnataka will take necessary action to acquire any land or structure that may be merged and/or affected under Singur Project and Andhra Pradesh agrees to bear the cost of acquisition, the cost of rehabilitation of the displaced families and the cost of construction of bridges and roads that may become necessary. Such acquisition and rehabilitation shall be as per the norms prevailing in Karnataka at the time of acquisition/rehabilitation. Karnataka also agrees to the submergence of the river bed and its stream-beds.

6. In the event of Andhra Pradesh developing hydroelectric power at Singur project. Karnataka and Andhra Pradesh agree to share the cost and benefits of such power in such proportion as may be agreed upon.

(134)

7. (a) Subject to the clearance of Polavaram Project by the Central Water Commission for on FRL/MWL plus 150 ft. the State of Andhra Pradesh agrees that a quantity of 80 TMC at 75 per cent dependability of Godavari waters from Polavaram project can be diverted into Krishna river above Vijayawada Anicut displacing the discharges from Nagarjunasagar Project for Krishna Delta, thus enabling the use of the said 80 TMC for projects upstream of Nagarjunasagar.

(b) The States of Andhra Pradesh land Karnataka agree that the said quantity of 80 TMC shall be shared in the proportion of Andhra Pradesh 45 TMC, Karnataka and Maharashtra together 35 TMC.

(c) Andhra Pradesh agrees to submit the Polavaram project report to central water Commission within three months of reaching an over-all agreement on Godavari waters among the five party States.

(d) Andhra Pradesh agrees to bear the cost of diversion fully.

(e) Maharashtra Karnataka are at liberty to utilise their share of 35 TMC mentioned in sub-para 7(b) above from the date of clearance of the Polavaram project by Central Water Commission with FRL/MWL of plus 150 ft., irrespective of the actual diversion taking place.

(135)

(f) It is also agreed that if the diversion at 75 per cent dependability as stated in clause (a) above exceeds the said quantity of 80 TMC due to diversion of Godavari waters from the proposed Polavaram Project into Krishna river, further diminishing the releases from Nagarjunasagar Project, such excess quantity shall also be shared between the three States in the same proportion as in sub-clause (b) above.

Mr.S.Chaudhari,
of Counsel for the State of Karnataka.

Mr.P.Ramachandra Reddy,
Advocate General for the State of
Andhra Pradesh.

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No. 16/27/2008-PA (N)/ 275 - 309

GOVERNMENT OF INDIA
CENTRAL WATER COMMISSION
PROJECT APPRAISAL ORGANIZATION
407, SEWA BHAWAN, R. K. PURAM, NEW DELHI-110 066

Date: 23rd Jaunuary, 2009

Sub: 95th meeting of the Advisory Committee for consideration of techno-economic viability of Irrigation, Flood Control and Multipurpose Project proposals held on 20.01.2009.

Enclosed please find herewith a copy of the summary record of discussions of the above meeting held at New Delhi on 20th January 2009 at Sewa Bhawan, R. K. Puram, New Delhi for information and necessary action.

Encl.: As above.

(U.K.Ghosh)
Chief Engineer (PAO)

To

Members of Committee:

1. Chairman, CWC, Sewa Bhawan, R. K. Puram, New Delhi.
2. Secretary (Expenditure), Ministry of Finance, (1st Floor) North Block,New Delhi.
3. Secretary, Department of Power, S.S. Bhawan, IInd Floor, New Delhi.
4. Secretary, Ministry of Environment & Forests, 4th Floor, Room No-404/05 Paryavaran Bhawan,CGO Complex, New Delhi.
5. Secretary, Ministry of Tribal Affairs, Room No. 738, A-Wing, Shastri Bhawan, New Delhi.
6. Secretary, Department of Agriculture & Cooperation, Room No 126,Krishi Bhawan, New Delhi.
7. Director General, ICAR, Room No-108, Krishi Bhawan, New Delhi.
8. Chairman, CEA, Sewa Bhawan, R. K. Puram, New Delhi.
9. Chairman, Central Ground Water Board, Jam Nagar House, Man Singh Road, New Delhi.
10. Principal Adviser (WR), Planning Commission, Room No-255, Yojana Bhawan, New Delhi with the request to accord investment clearance to the project proposals accepted by the Advisory Committee at an early date.
11. Principal Adviser (Power), Planning Commission, Room No-107 Yojana Bhawan, New Delhi.
12. Financial Adviser, Ministry of Water Resources, Room No-401 S.S. Bhawan, New Delhi.

Special Invitees:

13. Member (WP&P), CWC, New Delhi.

14. Member (D&R), CWC, New Delhi.
15. Member (RM), CWC, New Delhi.
16. Chairman, GFCC, 3rd Floor, Sinchai Bhawan,Patna-800015
17. Commissioner (Projects), Room No-411, S.S.Bhawan, MoWR, New Delhi.
18. Commissioner (Ganga), Ministry of Water Resources, CGO Complex, New Delhi.
19. Commissioner (Indus), Ministry of Water Resources, CGO Complex, New Delhi.
20. Chairman, Brahamaputra Board, Basistha, Guwahati-781029
21. Principal Secretary, Irrigation Deptt, Govt of Punjab Secretariat, Chandigarh, 160001.
22. Secretary (Water Resources), Government of Chhattisgarh,D.K. Bhawan, Sachivalaya, Raipur-492 010 (Chhattisgarh)
23. Secretary, Water Resources Deptt, Govt of Maharashtra, Mantralaya, Mumbai, 400032.
24. Secretary, Irrigation & Waterways Deptt,Govt. of West Bengal, Jalasampad Bhawan, Salt Lake , Kolkata – 700091.
25. Secretary, Water Resources Deptt, Govt of Bihar, Sinchai Bhawan, Patna – 800015.
26. Principal Secretary,Irrigation& CAD Department, Government of Andhra Pradesh, Room No. 716, 7th floor, J-Block, Secretariat Building,Hyderabad-500 022.
27. Principal Secretary, Irrigation Deptt, Govt of Punjab Secretariat, Chandigarh, 160001
28. Secretary, Irrigation & Waterways Deptt,Govt. of West Bengal, Jalasampad Bhawan, Salt Lake , Kolkata – 700091.
29. Secretary, Water Resources Deptt, Govt of Bihar, Sinchai Bhawan, Patna – 800015
30. Secretary, Irrigation & Public Health, Government of Himachal Pradesh, Sachivalaya, Simla-171 002
31. Chief Engineer (Mon-C), CWC, CGO Complex, Block-C, 3rd Floor, Seminary Hill, Nagpur – 440 006 (Maharashtra).
32. Chief Engineer (PMO), CWC, New Delhi.

Copy for information to –

33. Sr. PPS to Secretary, Ministry of Water Resources, Room No-407 New Delhi.

SUMMARY RECORD OF DISCUSSIONS OF THE 95TH MEETING OF THE ADVISORY COMMITTEE ON IRRIGATION, FLOOD CONTROL AND MULTIPURPURPOSE PROJECTS HELD ON 20TH JANUARY, 2009 FOR CONSIDERATION OF TECHNO-ECONOMIC VIABILITY OF PROJECT PROPOSALS.

The 95th meeting of the Advisory Committee for consideration of Techno-economic viability of Irrigation, Flood Control and Multi purpose Projects proposals was held on 20.01.2009 at 1430 Hrs. in the Central Water Commission Conference Room No. 523 (N), Sewa Bhawan, R.K. Puram, New Delhi under the chairmanship of Secretary (MoWR). List of participants is enclosed at Annexure-I.

The Chairman welcomed the members of the Committee and other officers present and thereafter requested the Member-Secretary to take up the Agenda for discussion. The items discussed and decisions taken are as follows:

A) CONFIRMATION OF THE MINUTES OF THE 94TH MEETING:

The Summary Record of Discussions of the 94th Advisory Committee meeting was circulated vide Lr. No.16/27/2008-PA (N)/1082-1106 dated 28th July, 2008. Member-Secretary informed the Committee that no comment on the same has since been received. The Committee confirmed the Summary Record of Discussions of the 94th Advisory Committee meeting.

B) FOLLOWING PROJECT PROPOSALS WERE PUT UP FOR CONSIDERATION OF THE 95TH ADVISORY COMMITTEE:

1) **Protection of Sialmari Area from the erosion of river Brahmaputra (construction of land spurs and tie bund), Morigaon District, Assam;**

CE (PAO) introduced the project proposal which envisages:

(i) Construction of three nos. land spurs with submerged nose and connected to embankment above HFL (L =750 m, 650 m & 670 m),
(ii) Tie bund (6.8 km), and
(iii) RCC Porcupines (2508 Nos at 1 location).

The original scheme was accorded investment clearance by the Planning Commission for Rs. 14.29 crore at PL 2002-03 vide No. 12 (I)/3/05-WR, dt. 17.01.08. Subsequently, in the 2nd meeting of empowered committee on Flood Management Program held at New Delhi on 06.08.2008 under the chairmanship of Secretary (Expenditure), Ministry of Finance, Govt. of India, it was suggested to revise the cost estimate at current price level. Accordingly, the estimate was revised by project authorities and submitted to CWC for examination. CWC has finalized the revised estimate for Rs. 25.73 crore (PL-2008) with BC ratio 2.92:1.

Chairman advised to take up the project in the current financial year itself so that completion of works could be ensured before the ensuing flood season.

After discussion, the Committee accepted the proposal.

2) **Protection of Bhojaikhati, Doloigaon and Ulubari area from the erosion of river Brahmaputra (construction of land spurs and tie bund), Morigaon District, Assam;**

CE (PAO) introduced the project proposal which envisages:

(i) Construction of three nos. land spurs with submerged nose and connected to embankment above HFL (L =450 m, 550 m & 760 m),

(ii) Providing 45 cm thick pitching and 8.25 m wide launching apron including toe key on river side of bund in a total length of 5.86 km at vulnerable reaches.

(iii) Providing 8.25 m wide launching apron including toe key for a length of 2.66 km.

(iv) Constructing 10 m wide road on the top of Alipur bund in three layers and black top, etc., for a stretch of 15.5 km and

(v) 10 m wide black top only from RD 15.5 km to RD 18.16 km.

The original scheme was approved by the Planning Commission vide Lr. No. 12 (1)/24/2006-WR. dt. 22.12.2006 for Rs. 42.20 crore. The present revised estimate has been finalized in CWC as per current price level and the cost has been finalized as Rs. 46.17 crore with BC ratio as 3.94:1.

After discussion, the Committee accepted the proposal.

12) **Indirasagar (Polavaram) Project, Andhra Pradesh;**

CE (PAO) introduced the project proposal which envisages

(i) 2310 m long earth and rock fill dam with 897.50 m long gated spillway across the river Godavari near Polavaram village with a gross storage of 5.511 BCM (194.60TMC) at FRL of +150 ft

(ii) 181.50 km long left main canal system with discharge capacity of 230 cum

(iii) 174 km long right main canal system with discharge capacity of 397.10 cum and

(iv) Power House and appurtenant works with installed capacity of 960 MW.

The CCA of the project is 2.91 lakh ha. with annual irrigation of 4.36 lakh ha. There is a provision of 23.44 TMC of water supply for Visakapatnam township and Steel plant. Besides, provision for diversion of 80 TMC of water to Krishna basin has also been kept. The project comes under purview of final award of Godavari Water Tribunal, 1980. The project proposal has been appraised in CWC and the estimated cost has been finalized as Rs. 10,151.04 crore at PL-2005-06 with BC ratio 1.73.

The clearances from MoTA and MoEF were accorded with few specific mentions as under:

(i) Environment clearance was accorded by MoEF with stipulation to adhere to the direction of Hon'ble High Court of Orissa dated 22.3.2006 on a petition WP (C) No. 9669 (2006) filed by Shri Laxman Munda, which states "It is open to the state of Andhra Pradesh to proceed with the construction of Indira Sagar (Polavaram) Multipurpose Project after complying with the requirements of all laws applicable in this regard, in such manner that no land/village/area situated within the territory of the state of Orissa is submerged.

ii) R&R clearance by MoTA was accorded with specific stipulation as under:

(a) *"This clearance is subject to the final orders to be passed by the Hon'ble Supreme Court in IA No. 1572, 1578 in 1572 in Writ Petition (Civil) No. 202 of 1995.*

and

(b)" *The Government of Andhra Pradesh, under the technical guidance of the Central Water Commission, shall ensure that no submergence and displacement of people including Scheduled Tribes (STs) takes place in the territories of States of Orissa and Chhattisgarh and the population of these two States including STs does not get adversely*

conditions of MoTA and MoEF which is in accordance with Interstate Agreement dated 2.4.1980 cannot be treated as change in the scope of the Project.

Commissioner (PR) observed that the proposed bunds are equivalent to flood protection bunds. As such they may not require environment clearance.

Member (WP&P) observed that protection of small area by providing protective bunds not only prevents submergence in the territories of Orissa and Chhattisgarh but also provides protection to the areas which otherwise are used to be submerged in the normal floods without dam.

The Principal Secretary, I&CAD Department, Andhra Pradesh agreed to send a report about the protection bunds for information to MoEF.

Mrs. R. Pant, Joint Secretary from MoTA pointed out that the number of ST families and ST population affected under the project reported while granting R&R clearance by MoTA and the figures reported in the TAC note are at variance while the number of affected villages remained to be same. Chief Engineer, Indira Sagar (Polavaram) project of Andhra Pradesh clarified that although Rehabilitation and Resettlement (R&R) of PAFs is dynamic process but there is no change in the figures reported in respect of affected Tribal families and tribal population. The salient features of the project, annexed to the TAC note found to have certain erroneous figures and hence corrected copy of salient features of the project has been circulated to the members before the meeting itself. As per the corrected copy there is no discrepancy. He further assured the committee that there is no change in the figures of tribal families and tribal population affected under the project.

The representative of MoTA queried about who would undertake construction of the embankments in Orissa and Chhattisgarh. The Secretary, I&CAD Department, Andhra Pradesh stated that adequate provision has been made in the cost estimate of the project and the fund would be placed at the disposal of respective state governments. However, the project authorities could undertake the construction works themselves if the concerned state governments desire so.

The Committee discussed the proposals in detail and finally accepted the project proposal with the following observations:

1. The project authorities shall give to the MoEF the details of the proposed protection bunds along Sabari and Sileru to prevent submergence in Orissa and Chhattisgarh in accordance with orders of Hon'ble High Court of Orissa and condition imposed by MoTA and MoEF and takes their concurrence before construction of these protection embankments.
2. The project authorities shall furnish a confirmation report to MoTA that there is no change in the number of project affected ST families and ST population from what was reported at the time of clearance of R&R plan by MoTA.
3. The state of Andhra Pradesh shall ensure that there is no submergence of any habitations or forest area in Orissa and Chhattisgarh as assured by them by constructing protective embankments with adequate drainage arrangements.
4. The project authorities shall fulfill the stipulated conditions of MoEF and MoTA as laid down in their respective clearances

13) **Utawali Medium Irrigation Project, (Revised Estimate) Maharashtra:**

CE (PAO) introduced the project proposal which envisages

(i) 2067 m long earthen dam with spillway across Utawali river in Tapi basin
(ii) Saddle dam across its tributary Landi Nalla with a ridge cut and
(iii) 17.51 km long right bank canal with discharge capacity of 5.014 cumec.

GOVERNMENT OF TELANGANA
ABSTRACT

Irrigation & CAD Department - Approval to allocate 90 TMC to Palamuru-Rangareddy LIS underutilisation in Minor Irrigation of Krishna Basin in Telangana and water diverted from Polavaram as per inter-state agreement - Orders - Issued.

IRRIGATION & CAD (ISWR) DEPARTMENT

G.O. Rt. No.246 Dated:18.08.2022

Read:-

From the Engineer-in-Chief (General), Irrigation & CAD Department, Hyderabad, letter no. ENC(G)/ISWR/DD(K)/DEE3/2614/Vol.35, Dated:05.03.2022.

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ORDER:

The Engineer-in-Chief (General), Irrigation & CAD Department, Hyderabad vide reference read above has stated that there is an underutilisation in Minor irrigation to an extent of 45.66 TMC in Krishna basin of Telangana. Further, he stated that out of 80 TMC Godavari water diverted from Polavaram to Prakasham barrage, as per 04.08.1978 agreement of GWDT Award, 45 TMC can be utilised upstream of Nagarjunasagar project, as CWC cleared Polavaram project vide 95th TAC in 2009. The Engineer-in-Chief (General), Hyderabad has requested to allocate 90 TMC to Palamuru Rangareddy LIS from out of 75% dependable flows out of 90.66 TMC.

2. After careful examination of the matter, Government hereby accord permission to allocate 90 TMC to Palamuru Rangareddy LIS out of 75% dependable flows.

3. The Engineer in Chief (General), Hyderabad shall take further necessary action in the matter accordingly.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF TELANGANA)

Dr. RAJAT KUMAR
SPECIAL CHIEF SECRETARY TO GOVERNMENT

To
The Engineer-in-Chief (General), I&CAD Department, Hyderabad.
SF/SC.

//FORWARDED BY ORDER//

SECTION OFFICER

Minor Irrigation Ayacut details and Utilisations in Telangana for the period from 1951-52 to 1960-61 as per (MRDK-VIII) in KWDT-I

S.No.	Year	Average Irrigated Area (acres)													
		Hyderabad		Khammam		Mahabubnagar		Medak		Nalgonda		Warangal		Grand Total	
		I Crop	II Crop	I Crop	II Crop	I Crop	II Crop	I Crop	II Crop	I Crop	II Crop	I Crop	II Crop	I Crop	II Crop
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
1	1951-52	24845	174			108015		26987	1485	124100		98107	171	382054	1830
2	1952-53	10680	277			93014	4717	20900	234	59034	1842	59387	959	243015	8029
3	1953-54	22988	293	41971	197	129945	9705	31644	2500	110190	25344	111000	8769	447738	46808
4	1954-55	29462	128	40420	485	145779	6013	26640	3196	99304	31570	96850	8612	438455	50004
5	1955-56	32246	4559	39940		175233	17730	22790	4690	115199	50810	96470	16540	481878	94329
6	1956-57	75680	341	42530		192062	31850	28360	5794	151953	56190	116300	19800	606885	113975
7	1957-58	54619		54946		161660	20692	25668	2566	124354	44950	97583	13759	518830	81967

8	1958-59	49730	6666	58600		177368	22530	26640	5489	135017	65880	113600	26590	560955	127155
9	1959-60	55810	17130	62470	212	198949	26250	29020	5225	138950	53930	117500	23390	602699	126137
10	1960-61	50710	5110	56740	142	141980	11790	22810	1079	98339	48480	91580	8974	462159	75575
Total of Each District		406770	3467 8	397617	1036	2E+06	151277	261459	32258	1E+06	378996	998377	127564	5E+06	725809
Average of Each District		40677	3468	49702	129	152401	15128	26146	3226	115644	37900	99838	12756	474467	72581
Duty in acres per MCft.		6.67	4.00	6.67	4.00	6.67	4.00	6.67	4.00	6.67	4.00	6.67	4.00		
Allocations in TMC		**6.102**	**0.867**	**7.455**	**0.032**	**22.860**	**3.782**	**3.922**	**0.806**	**17.347**	**9.475**	**14.976**	**3.189**	**72.661**	**18.152**
												TOTAL		**90.813**	

Source: i) MRDK VIII, Exhibit before KWDT-I.

ii) The allocations are based on the agreed duties of 6.67 acres/mcft in Kharif and 4 acres/mcft in Rabi as agreed before KWDT-I.

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