

Executive summary

1. Introduction

The head works are proposed at 25.50 km upstream of Sir Aurthur Cotton Barrage at Dowlaiswaram, on Akhanda Godavari Left Bank near Tadipudi village, of Tallapudi Mandal, to draw 56 cumecs of water from river Godavari.

The scheme is essentially a Lift irrigation scheme where waters are pumped from the River Godavari. As per the Tallapudi Project report, the Hydrology part was approved by Central water commission in 10/92, the available yield at seventy five percent dependability at the Proposed Tallapudi Projects site works out to 27.53 TMCUM (972.13 TMC). The demand of Chinthalapudi L.I. scheme is hardly 0.54737 TMCUM (15.50 TMC).

The salient features of the project is listed below

Salient Features

Features	Particulars
<i>Name of the scheme</i>	Chinthalapudi Lift Irrigation
<i>Location</i>	On River Godavari 25.50 km of Akhanda Godavari Right Bank (AGRB), West Godavari District, AP.
<i>Longitude</i>	81 ⁰ 39'43.0380" E
<i>Latitude</i>	17 ⁰ 08'59.7120" N
<i>Project cost</i>	Rs. 1,701.00 crores
<i>Estimate life of the project</i>	100 years
<i>Command area</i>	80,939 hectares (2,00,000 acres)
<i>Demand</i>	15.500 TMC Total 1.4530 TMC for drinking to 6.65 lakh population 14.047 TMC for Irrigation
<i>Discharge</i>	56 Cumecs (1977.64 cusecs)
<i>Static Head</i>	28 m 1 st Stage
<i>Main canal</i>	80 m 2 nd stage
<i>Minimum draw down level</i>	12 m
<i>Proposed dam</i>	Height 36 m & Length 4.500 km
<i>Reservoir</i>	Reservoir of 8 TMC capacity is proposed across Jalleru stream near Routhugudem village, Jeelugumilli Mandal, West Godavari district, AP.
<i>Mandals benefited</i>	15
<i>Villages benefited</i>	231
<i>Power required</i>	109.606 MW
<i>Sensitive areas other than forest</i>	None within 10 km distance
<i>Total land Required</i>	Total land 3,989.04 hectares Forest land 2,704.59 hectares Revenue land 1,282.45 hectares
<i>Forest land</i>	Forests – a. Bedadanuru RF- 0.0 km (2.8 to 3.4Km Bund) b. Bedadanuru RF – 0.0 km (0 to 1.8 km of bund) c. Bedadanuru RF- 0.0 km (29.4 to 31.1 km of channel)

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	<ul style="list-style-type: none"> d. Lankalapalli RF-7.5 km from barrage e. Marlagudem RF- 0.9 km from channel number 22.1 km in South direction f. Kopalli RF-1.0 km from channel 11.0 km in North direction. g. Karakapadu RF-0.0 km (0-3.5 km of channel) h. Kovvada RF-3.0 km from channel number 5 km in north direction.
<i>dam Meteorology</i>	
<i>Annual avg. rainfall (mm)</i>	1586.7 mm
<i>Max.and Min. temperature (°C)</i>	Max. 46 °C & Min. 27 °C
<i>Humidity (%) Min and Max.</i>	90% to 46%
<i>Wind speed (Kmph)</i>	Max. 8.46 kmph, Min. 3.35 kmph
<i>National Highway</i>	NH-5, Rajahmundry-35km
<i>Air Port</i>	Madhurapudi, Near Rajahmundry – 42 km
<i>Rail Head</i>	Kovvur, 25 km
<i>Road</i>	Tadipudi, 1 km
<i>Sea port</i>	Kakinada, 90 km
<i>Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration</i>	None within 10 km
<i>Inland, coastal, marine or underground waters</i>	None within 10 km
<i>State, National boundaries</i>	None within 10 km
<i>Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas</i>	None within 10 km
<i>Defense installations</i>	
<i>Densely populated or built-up area</i>	Aswaraopeta (24,405) Jangerddigudem (1,09,814) Buttayagudem (12,304)
<i>Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)</i>	None within 10 km

Alternative sites

One location has been discussed for the proposed project along the Akhanda Godavari Right Bank (AGRB) at 27.2 km.

2. Project description

The Chinthalapudi Lift Irrigation Scheme envisages pumping of 56 cumecs (56x35.315=1977.64 cusecs) of water from river Godavari in two packages.

1. 00-36 km – 45,000 acres
2. 36-68 km – 1,55,000 acres

Project profile:

- I. Lift-I from River Godavari near Tadipudi village
- II. Lift-II From leading channel near Kovvurupadu village
- III. Lift-III near Routhugudem village to reservoir across Jalleru stream

Components of CLIS Scheme are as follows:

Stage-I : Drawl and lifting of 15.50 TMC from river Godavari from EL +12.00 m to +40.00 m by constructing a pump house on Akhanda Godavari Right Bank at 25.50 km near Tadipudi(V), Tallapudi (M) and through pressure main to a length of 3.50 km and let out the water into leading channel near Kovvurupadu(V).

Stage-II: Lifting of 15.50 TMC from leading channel from EL +40.00 m to +120.00 m by constructing a pump house near Kovvurupadu(V) on right side of Indira Sagar Polavaram Right main canal through a pressure main of length o required and dropped into delivery cistern near Mangadevipeta(V).

Stage-III: Lifting of 29.13 Cumecs of water near Routhugudem(V), on Chinthalapudi Lift Irrigation Scheme Main canal to reservoir across Jalleru stream.

- i. Formation of 8 TMC reservoir with FRL +137.00 and free board of at least 3 m keeping sill level of canal in the reservoir at least _121.00 across Jalleru stream near Routhugudem(V).
- ii. Main canal, Branch canal and Distributary system including construction of CM&CD works to irrigate 2.0 lakh acres.
- iii. Field Channels including CM&CD works to irrigate 2.0 Lakh acres.

The sequence of transportation of waters in the system from river Godavari to the main canal is detailed below:

- About 56 cumecs (1977.64 cusecs) of water is drawn with minimum draw down level of +12.00 M from Akhanda Godavari Right Bank at 25.50 km. of Upstream of Sir Aurthur Cotton Barrage, through in approach channel to the sump of pump house without any change in water level.
- From the sump of pump house, 4 No's of vertical turbine pumps of each 6390 HP, lifts the water from +12.00 M to +40.00 M to drop into the delivery cistern of leading channel through 4 No's of 30.00 MM MS pipes of length of 3.25 km.
- The Leading channel section of 24.00 M X 3.00 M starts from the delivery cistern and runs to a length of 12.300 km and crosses the alignment of Indira Sagar Project Right Main canal at km 14.86 and flows up to 2nd stage pump house sump. From the sump of

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the pump house consisting of 4 No's of vertical turbine pumps of each 18252.5 HP, the water is lifted from +40.00M to +120.00M to drop into the delivery cistern of main canal through 4 No's of 30.00 mm MS pressure main length of 3.25 km.

- The main canal section of 24.00M X 3.00M starts from the delivery cistern and runs to a length of 68.00 km.
- One lift is proposed in 3rd stage at 33.00 km on main canal to deliver the water into delivery system of Jalleru reservoir of 8 TMC.

The scheme is a major irrigation project conferring irrigation benefits to an extent of 80,939 Ha. (2,00,000 acres).

Environmental Impact Assessment

As per MoEF Notification, 14th September, 2006, the proposed project is falling under 'A' category based on command area (more than 10,000 hectares). The proponent want to prepare Environmental Impact Assessment (EIA) report is not only to obtain Environment Clearance (EC) from Ministry of Environment and Forests, Govt. of India but also to understand the likely impacts and to take Environmental protection measures during and after commissioning of the project. Due to this reason 'Irrigation and CAD department of Andhra Pradesh entrusted the job of preparation of EIA to M/s Pragathi Labs & Consultants Pvt. Ltd.

M/s Pragathi Labs is accredited with QCI (NABET) to the sector of 'Irrigation' (Ref: MoEF gazette notification no: 1(C)).

The EIA study includes determination of baseline conditions, assessment of the Impacts on the environment due to the proposed project activity and making recommendations on the preventive measures to be taken, to minimize the impact on the environment to acceptable levels. A suitable post-study monitoring program will be outlined.

The baseline studies will consist of 3 seasonal studies (Pre-monsoon, monsoon and winter seasons) will be conducted in the study area.

Air Environment

Meteorology

Existing data of the region

The general climate in this region is characterized by the hot summer and general dryness except during the south-west monsoon.

a)	Seasonal rainfall	
i)	South West monsoon	1515 mm
ii)	North West Monsoon	312 mm
iii)	Non-monsoon	132 mm
b)	Temperature	Max. 46 °C & Min. 27 °C
c)	Humidity	90% to 46%
d)	Wind speed	Max. 8.46 kmph, Min. 3.35 kmph

Rainfall

West Godavari rain fall (in mm) Month wise: 2012-13

S.No.	Month	Normal	2012-13
1	June	112.4	99.6
2	July	246.4	311.0
3	August	247.7	349.3
4	September	178.5	270.9
5	October	169.3	191.0
6	November	65.4	292.0
7	December	10.7	0.0
8	January	10.4	2.8
9	February	7.5	24.2
10	March	14.6	0.0
11	April	18.4	33.3
12	May	71.7	12.6
Total		1153.0	1586.7

Source: Agricultural Statistics at a Glance Andhra Pradesh 2012-2013

The sky will be cloudy during the monsoon period and rapidly decreased in post monsoon season. Rest of the season, the sky will be generally clear. Storms and depressions originate in the Bay of Bengal in the post south-west monsoon and north-west monsoon season normally from October to December, which crosses the coast and affect the weather over the command area causing wide spread rains in the command areas.

Primary data collection

Meteorological observations at a suitable location at the project site will be carried out during the study period. The monitoring will be carried out on regular basis for the following parameters on hourly basis like

- Wind speed and direction
- Temperature
- Relative humidity
- Rainfall and
- Solar radiation

Apart from this wind roses will be given 00-07, 8-15, 16-23 and 00-23 hours separately. The monitored data will be used as an input for mathematical modeling.

Ambient Air Quality Monitoring (AAQM)

The baseline data generation on Ambient Air Quality will be carried out for 12 selected locations within the study area.

The frequency of AAQ monitoring will be carried out as per the MoEF guidelines. Samples will be collected for PM₁₀, PM_{2.5}, SO₂, and NO₂ for 24 hours. The results will be computed as maximum, minimum and 98th percentiles and the results will be compared with NAAQS.

Anticipated Impacts

Constructional activities of the proposed project may contribute dust during construction phase. Change in dust emissions during construction phase is only temporary. Gaseous emissions are expected from vehicles and machinery directly or indirectly. In order to understand the quantum of emissions air quality modeling will be carried out. In the post project condition the dust emissions might reduce to soil moisture.

The increase in moisture in soil, the air borne particulate emission will reduce and there are more possibilities to reduce particulates in the ambient air. The moisture level in the soil may reduce maximum temperature at present.

No undesirable changes are anticipated during post project period.

Mitigation Measures

Dust emission sources identified (vehicular movement, machines used during construction phase) will be identified and proper control measures will be adopted. The identified areas used for green belt development which acts as sinks of pollutants.

The eroded roads, areas will be identified and water sprinkling will be carried out to arrest wind prone particle distribution.

Noise Levels

Presently in the study area there are no major noise emanating sources except vehicular movements. There are no major industries in the study area. Large part of the surrounding is used for agriculture and allied activities. Residential areas are very limited.

Noise Level Monitoring will be conducted at about 4 locations of project area covering various categories (such as residential, commercial and sensitive) mentioned in the Environment Protection Rules and as per the specifications of the MoEF/CPCB. The survey is carried out once during EIA study period. Readings will be taken over 24-hour period at each location depending on the level of activity. L_{day}, L_{night} and L_{eq} values will be given based on 24 hourly measurements.

Sources of noise and its impact on the environment will be addressed. The noise level at varying distances for multi-sources was predicted using Noise model. The possibilities of major noise sources will be transportation of vehicles during constructional phase.

Anticipated Impacts

During the construction phase the noise level may increase than at present due to constructional activities. However these are temporary. No major changes in noise levels are anticipated during post project time.

Mitigation Measures

The potential mitigation measures will be identified and addressed to reduction in noise levels by control at source (regular maintenance of vehicles and machines), provision of green belt to mitigate noise during its propagation, isolation of high noise generating sources, use of protective measures (ear plugs etc.) especially in high noise areas.

A comparison of measured noise (Leq) at monitoring locations to that of predicted noise levels (Leq) will be made and mitigatory measures will be recommended to confirm to regulatory ambient air noise standards.

Water Quality

Crop water Requirement

The crop water requirement for the proposed cropping pattern are worked out as per modified penman method. The demand is worked out as 547.38 M.cum (19,330.72 M.cft) for supplying waters to the wet ayacut of 8200 Ha (20,262 Acres) for paddy cultivation and for feeding the irrigated dry crops over an extent of 72,739 Ha (1,79,738 Acres). This demand also includes supply of another 83.95 M.cum (2,964.39 M.cft) of water towards drinking needs in the command area villages.

The Demand worked out is as follows

S.No.	Description of the Crop	Main Canal	
		Ayacut (Ac.)	Demand (TMC)
1	Paddy	20262	2.561
2	Ground Nut	80745	3.298
3	Chillies	64231	2.866
4	Maize	34762	1.717
5	Drinking Water		1.453
6	Storage		3.605
Total		200000	15.50

Total Demand = 15.50 TMC or 547.38 M.Cum

For assessing the water quality in the study area, the water samples will be collected from about 28 locations covering both surface (16 locations) and ground water (12 locations) sources during the study period. The locations will be selected based on the reconnaissance survey of the area. Selection of parameters for sampling will be carried out as per the following procedures:

1. Analysis of Water Quality from surface water bodies will be carried out as per **IS: 2296 (Streams Standards)**

2. Analysis of Drinking Water Quality will be carried out as per **IS: 10500** Methods specified in "Standard Methods for Examination of Water and Wastewater" published by American Public Health Association (APHA) were adopted.

The assessment of potential impacts of the project will be carried out with respect to:

- i. Ground water quality degradation if any
- ii. Surface and river water quality degradation if any
- iii. Available water resources and their utilization in the study area
- iv. Potential for contamination of surface and ground water resources.
- v. Impact on water sources due to shifting of water courses if any

Anticipated Impacts

The irrigational facilities will increase the moisture levels in the soil. The ground water levels will increase in the surrounding wells.

Mitigation Measures

Some examples of potential mitigation measures are applicable to reduce adverse impact on surface water and sources at the site, if any control measures will be suggested. Potential alterations of ground water will be identified during impact assessment.

Land Environment

Irrigation Planning

Existing Cropping Pattern

An extent of 1, 02, 237 Acres (41,375 Ha.) is now under cultivation from supplies of rain fed tanks. The existing cropping pattern is detailed below.

S.No.	Name of the crop Cultivated	Extent	
		Ha.	Ac.
1	Paddy	8200	20262
2	Ground Nut	12350	30517
3	Chillies	12546	31001
4	Maize	8279	20457
Total		41375	102237

Source: Agricultural Statistics at a Glance Andhra Pradesh 2012-2013

The value of these food grains harvested from the existing ayacut works out of Rs.11,153 lakhs per year.

Proposed Cropping Pattern

S.No.	Name of the Crop	Main Canal	
		Hectares	Acres
1	Paddy	8200	20262
2	Ground Nut	32677	80745
3	Chillies	25994	6431
4	Maize	14068	34762
Total		80939	200000

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The value of these food grains harvested from the proposed ayacut works out to Rs.30, 452.00 lakhs per year.

There is good scope for double and multiple cropping patterns. However, the pumping is resorted only from June to November from surplus water of Godavari. It is not possible to meet the requirements for the double and multiple cropping patterns. The quantity of water available is sufficient to serve the ayacut of 80939 Ha (200000 Acres) during Khariff Season only.

Existing data of the region

Statement showing the mandal wise gross ayacut and culturable command area of Chinthalapudi lift irrigation scheme.

S.No	MANDALS	Gross ayacut in acres (Excluding forest and hilly area)	Culturable Command area in acres (60% of gross ayacut)
1	Gopalapuram	9,500	5,700
2	Koyyalagudem	29,500	17,700
3	Buttaigudem	18,371	11,023
4	Jangareddygudem	32,178	19,307
5	Jeelugumilli	12,600	7,560
6	Chinthalapudi	30,600	18360
7	T.Narasapuram	42,144	25,286
8	Lingampalem	35,500	21300
9	Kamavarapukota	36,015	21,609
10	Peddavegi	29,715	17,829
11	Dweraka Tirumala	13,653	8,192
12	Nallagerla	7,500	4,500
13	Vissannapeta	16,400	9,840
14	Chatrai	5,765	3,460
15	Nuziveedu	14,500	8,700
Total		3,33,941	2,00,366(Or Say 2,00,000)

The earthquake was recorded at Jangareddygudem, West Godavari district in 24/07/1990 as an intensity of 3.6 magnitude. **Source is Compendium of Environment Statistics, Andhra Pradesh: 2011/2012.**

Total 10 samples will be collected to understand physical and fertility status of the soil. The study also helps to understand in identifying contaminated areas if any due to application of pesticides, fungicides or any chemicals. Parameters such as pH, EC, Texture, SAR, CEC, OC, N,P,K, heavy metals are analyzed to know the pre-project status. Soil infiltration status will be identified to know the possibility of soil contamination if at all any accidental leakage / spillage of chemicals.

Anticipated Impacts

The land use may change due to irrigation facilities. Similarly farmers go more for cash crops. The moisturized soil encourages more biomass and increase the soil organic matter. It will give more aesthetic look than now.

Mitigation Measures

Selection of proper suitable plant species for green belt development will reduce the soil erosion. Green belt development plant with diversified plant species will increase the sustainability of ecosystem. The green belt not only gives shade, but also attracts avifauna and

helps as fodder to local live stock. The project area will be surveyed and if loss any important species will be identified and proper conservation methods will be adopted.

Biological Environment

The loss of biomass at inundated areas and project activity purposes will be estimated. Detailed enumeration of flora and fauna will be carried out to understand the diversity of the area and to know the presence of any important plant species (threatened, rare, endangered sp. Etc.) to take appropriate conservation methods.

Anticipated Impacts

Any loss of important species will have negative impact on environment. Hence the detailed enumeration of species will be carried out to take appropriate conservation measures in initial stages before they vanish.

The irrigation facilities change microclimate of the soil. The change in habitat condition may change the diversity as well chemical nature of the soil.

Mitigation Measures

The loss of biomass if any will be compensate with development of suitable native plant species. Any loss of important species will be highlighted and conservation methods will be given. Development of green belt for sustainable ecosystem will be given. List of plant species will be given to arrest soil erosion, stabilization of waste will be projected based on the size and nature.

Socio-economic environment

The majority of population in the command area is agricultural labours, who are economically backward due to lack of irrigation facilities. The people in the area are purely agricultural oriented and there are few Rice mills, Sugar mills, Flour mills, Saw mills. Almost every village is electrified.

Due to the proposed project few people get affected (fully or partially due to submergence) and large number of people get benefitted (due to irrigation facilities).

Affected villages

The habitation villages are affected under submergence of Jalleru reservoir F.R.L 137 m is listed in the following table

No.	Fully affected
1	Bedadanuru
Partly affected	
2	Bottappagudem
3	Jillelagudem
4	Routugudem
5	Ankampalem
6	Kamayyapalem
7	Tatiramudugudem

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8	Gopalpuram
9	Lankalapalli
10	Rachannagudem
11	Jagannadhapuram
12	Puchikapadu

Detailed study of RR plan will be carried at affected areas. For Project Affected and Displaced Families, (PAFs/PDFs) including special category group of Tribal, SCs & STs and vulnerable sections will be compensated as per

1. Government of Andhra Pradesh R&R policy, 2005
2. National Rehabilitation and Resettlement Act, 2013.

In both the policies, whichever is more beneficial will be adopted to get maximum benefits to the affected population.

Benefitted villages

Nearly 231 villages are falling under 15 mandals which are found in two districts viz., West Godavari and Krishna. The breakup of villages under different mandals is listed in Table 1.1.

Table 1.1 List of Benefitted Mandals

S.No.	District	Mandal	No. of villages
1	West Godavari	Gopalapuram	11
2		Koyyakagudem	14
3		Buttaigudem	13
4		Jeelugumilli	12
5		Chinthalapudi	30
6		T.Narsapuram	17
7		Lingapalem	25
8		Kamavarapukota	14
9		Pedavegi	20
10		Jangareddygudem	20
11		DwarakaTirumala	25
12		Nallajerla	05
13	Krishna	Vissannapeta	06
14		Chatrai	12
15		Nuzvid	07
Total			231

The density of the population in the command area is 270/Sq.km., as against the state average of 157. Sq.km.

Under the socioeconomic studies apart from R& R studies, the effect of the project on historical, cultural and ecological important places falling within the study area are also discussed to understand the impact of the project on them.

These are benefited by the scheme when scheme implemented and makes the land greenery in West Godavari District. Besides this, the scheme provides drinking water for population of 6.65 lakhs in 231 village's enroute the main canal in the command area at the rate of 140 liters per capita per day.

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**CHINTALAPUDI LIFT IRRIGATION SCHEME
CALCULATION OF BENEFIT COST RATIO (BCR)**

S.No		Before Irrigation	After Irrigation
A	GROSS RECEIPTS		
1	Gross value of farm produce	11153.00	30452.00
2	Dung Receipts (At 30% of the Fodder Expenditure)	334.59	913.56
3	TOTAL (A): Gross receipts (1+2)	11487.59	31365.56
B	EXPENSES		
1	Expenditure on Seeds	752.51	1176.15
2	Expenditure on Manure Etc.	785.69	1390.39
3	Expenditure on Hired labour (Human and Bullock)	904.34	1516.49
4	Fodder Expenses (As percentage of gross value produce)	1648.47	4500.96
5	depreciation on implements	293.10	489.96
6	Share and cash rent	537.36	898.27
7	Land Revenue	217.61	549.73
8	TOTAL (B): EXPENSES (1 to 7)	5139.08	10521.95
C	NET VALUE OF PRODUCE		
1	Total gross receipts (Total A.3)	11487.59	31365.56
2	Minus total Expenses (Total B.8)	5139.08	10521.95
3	Net value of produce© (1-2)	6348.51	20843.61
D	ANNUAL AGRICULTURAL BENEFITS		
1	Net value after irrigation (C.3)		20843.61
2	Minus Net value before irrigation		6348.51
3	Net Annual Benefits		14495.10
E	OTHER NET ANNUAL BENEFITS DUE TO AQUA CULTURE INCLUDING PISCICULTURE, DRINKING & INDUSTRIAL WATER SUPPLY, HYDRO POWER GENERATION, ANIMAL HUSBANDRY, CATCHMENT AREA TREATMENT CHARGEABLE TO PROJECT CANAL BANK PLANTATION, RESERVOIR PERIPHERY AFFORESTATION ETC.		
F	TOTAL NET ANNUAL BENEFITS (D3+E)		14495.10
G	ANNUAL COSTS;		
1	Interest on capital @ 10% (Estimated total cost of the project including cost of land development (155470+80939*1500)		1321.00
2	Depreciation of the project @ 1% of the cost of the project for 100 years life of the project and @ 2% for 50 years of life of the project.(54195)		541.95
3	Annual operation and maintenance charges at Rs.600/Ha CCA for 80939		485.63
5	Maintenance of head works at 1% of its cost rs.102994		103.00
6	Depreciation of the pumping system @ 6.66% of the estimated cost of the pumping system assuming life of the system as 15 years (Applicable to Lift Irrigation) for stage II pump House and mechanical electrical works of stage I i.e. on Rs.37050		2468.00
7	Depreciation of the Raising mains @ 3.33% of the estimated cost of the Raising mains assuming life of the system as 30 years (Applicable to Lift irrigation) for 1 st stage Lifts i.e. on 19329		643.65
8	Depreciation of the Raising mains @ 3.33% of the estimated cost of the raising mains assuming life of the system as 30 years (Applicable to Lift Irrigation) for 2nd stage Lifts 20332		677.05
9	Power charges for Lift Irrigation @ Rs.1533.12 per Ha (Applicable to Lift Irrigation for 18 hours pumping/day for 90 days at Rs.2.72/Unit 73504 x18 x90=119076480 X2.72		3239.00
	TOTAL (G) : Annual Costs		9479.28
	BENEFIT COST RATIO =F: ANNUAL BENEFITS/G8: ANNUAL COST	Benefit	cost
		14495.10	9479.28
	B.C Ratio	1.53:1	

Anticipated Impacts

Due to proposed project, more people get benefitted due to irrigation. The existing cropping pattern may change significantly. The economic status of the people will improve than the existing. People get benefitted due to implementation of R&R plan either in the form of getting pukka houses, land replacement and compensation money.

Mitigation Measures

Strict implementation of R& R plan will benefit the affected population. It necessary to see the benefits should reach the proper affected person in the area

Hydrology of the basin

- Hydro-meteorology, drainage systems
- Catastrophic events like cloud bursts and flash floods
- For estimation of Sedimentation rate direct sampling of river flow is to be done during EIA to get actual silt flow rate (to be expressed in ha-m km-2 year-1). The one year of EIA study will provide an opportunity to do this for ascertaining the actual silt flow rate.
- Water availability for the project and the aquatic fauna
- Design discharge and its recurrence interval.

Existing data of the Reservoir and Channel

Proposed Jalleru Reservoir details

No.	Description	
1	Reservoir formation	8 TMC
2	Lifting	29.13 Cumecs
3	F.R.L	+137.0 m
4	Free Board	5 m
5	T.B.L	+140.0
6	Worked out capacity	TMC
7	Length of Bund	4.600 km
8	Top width of Bund	6 m
9	Slopes	
10	a. Up stream	2.5:1
	b. Down stream	2:1
11	Catchment Area	315.61 Sq.km

Reservoir Standards

Maximum flood discharge	1101 Cumecs
Design head "Hd"	9 m
Value of "Cd"	2.15
Length of spillway	39.00 m
T.B.L	+140.00 m
M.W.L/F.R.L	137.00 m
Crest level	126.00 m

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Max.T.W.L	124.00 m
Foundation level	119.00 m
No.of vents	2+1(For incorporative Condition)
Size of vent	11.00 m*9.00 m
Type of gate	Radial
Thickness of intermediate pier	3.00 m
Thickness of end pier	2.5 m
Type of energy dissipation	Trajectory Bucket
Road bridge level	+140.00 m
Hoist platform level	+138.50 m(Tentative)

**Hydraulic particulars of Chinthalapudi Lift Irrigation Scheme
Channel 0.00 km to 68.00 km**

No.	Description	Details at Start	Details at End
Package-1: Reach-1 from 0.00 km to 34.450km			
1	Discharged required	56 Cumecs	56 Cumecs
2	Discharged designed	58.1 Cumecs	58.1 Cumecs
3	Bed width	24.0 m	24.0 m
4	FS Depth	3.20 m	3.20 m
5	Free board	0.75 m	0.75 m
6	Bed Fall	1 in 15,000	1 in 15,000
7	Volume of n	0.025	0.025
8	Velocity	0.616 m/s	0.616 m/s
9	Side slopes	1.5:1	1.5:1
10	Top width of Bank L/R	8.00/5.00	8.00/5.00
11	Top of Bank Level (TBL)	121.500 m	118.183 m
12	Full Supply Level (FSL)	120.400 m	117.433 m
13	Canal Bed Level (CBL)	117.200 m	114.203 m
Reach-2 from 34.450 km to 36.00 km			
1	Discharged required	31 Cumecs	31 Cumecs
2	Discharged designed	31.09 Cumecs	31.09 Cumecs
3	Bed width	18.50 m	18.50 m
4	FS Depth	2.60 m	2.60 m
5	Free board	0.75 m	0.75 m
6	Bed Fall	1 in 15,000	1 in 15,000
7	Volume of n	0.025	0.025
8	Velocity	0.534 m/s	0.534 m/s
9	Side slopes	1.5:1	1.5:1
10	Top width of Bank L/R	8.00/5.00	8.00/5.00
11	Top of Bank Level (TBL)	118.153 m	117.450 m
12	Full Supply Level (FSL)	117.403 m	116.700 m
13	Canal Bed Level (CBL)	114.203 m	114.100 m
Package-2: Reach from 34.450 km to 36.00 km			
1	Discharged required	31 Cumecs	31 Cumecs
2	Discharged designed	31.09 Cumecs	31.09 Cumecs
3	Bed width	18.50 m	18.50 m
4	FS Depth	2.60 m	2.60 m

Chinthalapudi Lift Irrigation Scheme, Eluru

5	Free board	0.75 m	0.75 m
6	Bed Fall	1 in 15,000	1 in 15,000
7	Volume of n	0.025	0.025
8	Velocity	0.534 m/s	0.534 m/s
9	Side slopes	1.5:1	1.5:1
10	Top width of Bank L/R	8.00/5.00	8.00/5.00
11	Top of Bank Level (TBL)	117.620 m	115.379 m
12	Full Supply Level (FSL)	116.870 m	114.629 m
13	Canal Bed Level (CBL)	114.270 m	112.029 m

9. Environmental Management Plan

The EIA study includes determination of baseline conditions, assessment of the impacts on the environment due to the proposed project activity and making recommendations on the preventive measures to be taken, to minimize the impact on the environment to acceptable levels. A suitable post-study monitoring program will be outlined.

The report will be prepared as per the methodology for testing of environmental attributes, EIA /EMP will be based on the Revised (November 2009) Model Terms of Reference for the Preparation of Environmental Impact Assessment (EIA) Report on proposed projects for Consideration by Expert Appraisal Committee.