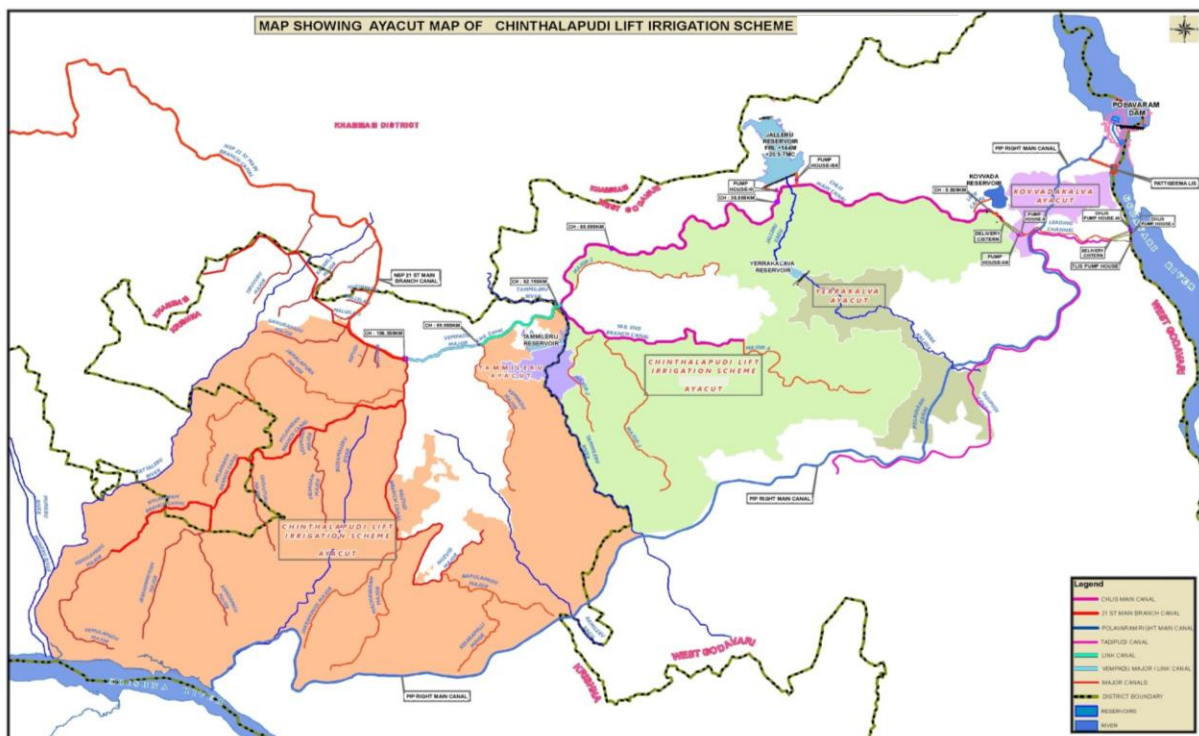


**GOVERNMENT OF ANDHRA PRADESH
WATER RESOURCES DEPARTMENT**



**CHINTHALAPUDI LIFT IRRIGATION SCHEME
PRE FESIBILITY REPORT**



Project Proponent

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Andhra Pradesh – 533125

Chinthalapudi Lift Irrigation scheme on River Godavari Near Tadipudi (V) in West Godavari district

1.0 INTRODUCTION

The Chinthalapudi Lift Irrigation Scheme proposed by the Water Resources Department of Andhra Pradesh has given thrust to provide drinking water facilities to about 25.94 lakhs population in 410 habitations. Besides the scheme provides assured irrigation facilities to 480000 acres in upland area of West Godavari and Krishna districts of Andhra Pradesh.

The area covered by the ayacut of Chinthalapudi L.I. Scheme constitutes the part of upland area in the West Godavari and Krishna Districts covering an extent of 835 Sq. Kms. The area is plain with occasionally High grounds and comparatively scarcely populated with a total population not exceeding 25.94 Lakhs. The Agriculturist is the child of the area. His entire life style veers round the bounties that nature offers in the vicinity. The passage of the time has put tremendous pressure on the farmer and the environment around him. Levelling of the areas, cultivating whatever land is available and satisfying with what the land gives are all but a few indications of the hazards the man of the soil is put to. Unemployment looms large on the agriculture laborer in West Godavari and Krishna Districts with de-escalation of working opportunities. There are around 15 lakh agricultural laborers in the districts who are directly or indirectly dependent on farm labour wages.

The ayacut proposed under this L.I. Scheme is a drought stricken area, almost all the people are backward and below poverty Line. There is no other skill on which the people of this region can depend upon for economic development except irrigation, which is at very poor level. There are tanks in the area fed by small catchments of their own. The vagaries of the rainfall and frequent failure of monsoon make the tanks dry. Though every land under the tanks is cultivated ayacut in these areas already brought under irrigation entirely depends upon rains and therefore the crop production is not assured in most cases. In spite of this, the struggle for cultivation did not die. The farmers are attempting paddy during the kharif season and other dry crops during the Rabi season. Even though, there are frequent failures, facing more struggles in cultivation never made them obviate from it and they are continuing the cultivation by changing the cropping pattern to stake their fortunes year after year.

The proposed ayacut of the Chinthalapudi Lift irrigation scheme covers in upland areas of following 15 mandals in West Godavari district and 18 mandals in Krishna district respectively.

| S No. | Name of the District | Details of mandals proposed to get benefitted |
|-------|----------------------|--|
| 1 | West Godavari | 1. Gopalapuram 2. Koyyalagudem 3. Buttaigudem 4. Jangareddigudem 5. Jeelugumilli 6. Chinthalapudi 7. T. Narasapuram 8. Lingampalem 9. Kamavarapukota 10. Denduluru 11. Pedavegi 12. Devarapalli 13. Dwaraka Tirumala 14. Nallajerla 15. pedapadu |
| 2 | Krishna | 1. Vissannapeta 2. A. Konduru 3. Tiruvuru 4. Gampalagudem 5. Reddygudem 6. Mylavaram 7. G.Konduru 8. Vijayawada 9. Ibrahimpatnam 10. Kanchikacherla 11. Veerulapadu 12. Bapulapadu |

| | | |
|--|--|---|
| | | 13. Gannavaram 14. Nuziveed 15. Agiripalli 16. Chatrai 17. Musunuru 18. Unguturu |
|--|--|---|

The ayacutdars of these regions are agitating for early benefits and requesting for an alternate pumping scheme. The Torrigedda pumping scheme, Venkatanagaram pumping Scheme, Tarakarama Ramavarapu Ava L.I. Scheme, Tadipudi and Pushkara LI Schemes and the Chagalnadu L.I. Scheme were constructed on Godavari River and successfully functioning and elevating the Economical standards of the local people. Perhaps getting inspiration from their adjacent brothers, the ayacutdars of the Chinthalapudi L.I. Scheme are also agitating for supplementing water to the Reservoir in the Area and for irrigation facilities to other areas by lifting water from Godavari river which is flowing adjacent the proposed ayacut of the scheme.

The scheme provides early benefits and avoids uncertain conditions and backwardness of these areas.

2.1 Identification of the Project Proponent

The Water Resource Department under Government of Andhra Pradesh is responsible for the development of irrigation schemes. The project details and various components are being carried out under the Chief Engineer, Godavari Delta System, Water Resources Department, Dowalaiswaram, Andhra Pradesh – 533125.

2.2 Brief Information about the Project

SALIENT FEATURES AT A GLANCE

| | |
|---|---|
| 1. Name of the project | : Chinthalapudi Lift Irrigation Scheme |
| 2. Location | : On River Godavari at Km.27.20 of A.G.R.B |
| Latitude | : 17 ⁰ 09' 2" N |
| Longitude | : 81 ⁰ 39' 49" E |
| 3. Project Cost | : Rs. 4909.80 Crores |
| 4. Ayacut | : 194253 Ha. (480000 Acres) |
| 5. Demand | : 53.50 TMC |
| 6. Discharge | : 194.52 Cumecs (6870 Cusecs) |
| 7. Minimum draw down level | : +14.00 M |
| 8. Pump and Pressure Main Details | |
| i. Pressure Main from Head Work pump | : 18 Nos of Pumps & 11 No. of |
| House to Delivery cistern | : 3200 mm dia MS for a Length of 3 km |
| ii. Pressure Main from 2 nd stage pump | : 14 Nos of 3000 mm dia MS for a |
| House to delivery cistern | : Length of 3.30 km. |
| iii. Static from 3 rd stage | : 6 No's of Pumps and 4 No. of rows of 3000mm |
| Pump house to Reservoir | : diameter M.S Pipe for a length of 1.400 km |
| 9. Mandals Benefited | : 33 Mandals. |
| 10. Villages Benefited | : 410 villages. |
| 11. Power required | : 396 MW |
| 12. Jalleru Reservoir | |
| a) Gross storage | : 20.50 TMC |
| b) Dead storage | : 0.940 TMC |
| c) Live storage | : 19.56 TMC |
| d) Full Reservoir Level | : +144.000 m. |
| f) TBL | : +149.000 m. |

2.3 Need for the Project and its importance to the country and or region

The quality of ground water in West Godavari district areas like Jangareddygudem, Denduluru, Eluru, Peddapadu and Buttaigudem has shown high nitrates and brackish nature. SAR is low and salinity hazard is high. Corrosion problem exists in Buttaigudem, Koyyalagudem, Devarapalli, Nallajerla and Dwaraka Tirumala.

The quality of ground water in Krishna district areas like Kanchikacherla, Vissannapeta, Gampalagudem is found to have high EC values more than permissible limits. In A.Konduru, Tiruvuru, Gampalagudem, Kanchikacherla, Nuziveed, Gannavaram and Bapula padu mandals fluoride problem is persistent not suitable for domestic purposes.

In order to meet the drinking water needs of 25.94 lakh people in 410 habitations and to meet irrigation water demand for 1,94,253 ha the Chintalapudi Lift Irrigation Scheme is proposed by the Government of Andhra Pradesh.

2.4 Demand and Justification

Provide drinking water to the about 25.94 lacks population and Irrigation is proposed over an extent of 1,94,253 Ha. (4,80,000 Ac) and the requirement of waters is arrived by the modified Penman Method. The rainfall data for this purpose is taken from the four rain gauge stations at Polavaram, Kovvuru, Jangareddigudem and Chintalapudi which are influencing the command area. The Evapotranspiration rates are taken from the Meteorological data obtained at Central Tobacco Research Institute, Katheru village, Rajahmundry.

2.5 Employment Generation (Direct and Indirect) due to the project

The project will benefit the socio- economic development of the West Godavari and Krishna districts, since agriculture is the only sector giving employment and there are presently no other major employment opportunities like industries, construction etc. in the project area.

The proposed project will involve labour for construction of reservoir, excavation of canal water distribution systems and other infrastructure etc. This is likely to be an important sector of employment for the poor, especially the landless rural poor.

Increased employment in agriculture due to increased cropping intensity, increased crop area and output from irrigation. Rural poverty levels may therefore be reduced by increased employment opportunities.

Employees required for the proposed project during construction phase indirectly about 1500 and directly about 2000 in those skilled persons nearly 185 and unskilled persons nearly about 1815.

From the proposed project 15 lakh agricultural laborers in the districts who are directly or indirectly dependent on farm labour wages are benefited and besides this employees required during operation phase directly about 350 and indirectly nearly 100.

3 PROJECT DESCRIPTION

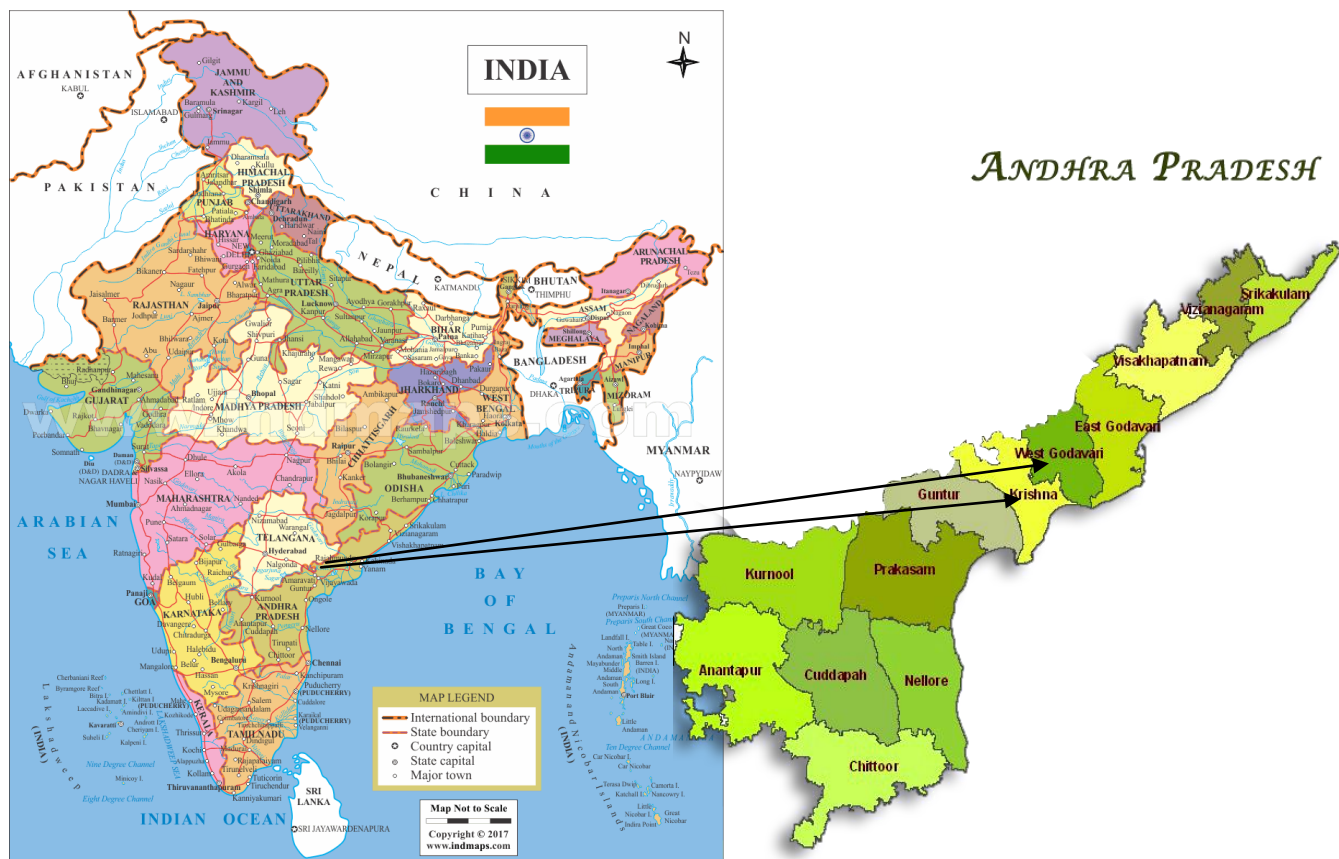
3.1 Location (map showing general location, specific location, and project boundary & project site layout) with coordinates.

The site of the off-take point from where the Godavari waters are proposed to be drawn is situated at Tadipudi village, Tallapudi Mandal located on the right side of river Godavari on the road connecting Vijjeswaram to Polavaram (at km 27.20) in West Godavari District, Andhra Pradesh. Kovvur is the nearest Railway Station on Chennai – Kolkata railway line at a distance of 20 km. Another nearest big railway station, Rajahmundry is situated on the other side of river Godavari in East Godavari district. The longitude and latitude of the proposed scheme are as follows:

Longitude: $81^{\circ} - 39' - 49''$ E

Latitude: $17^{\circ} - 09' - 02''$ N

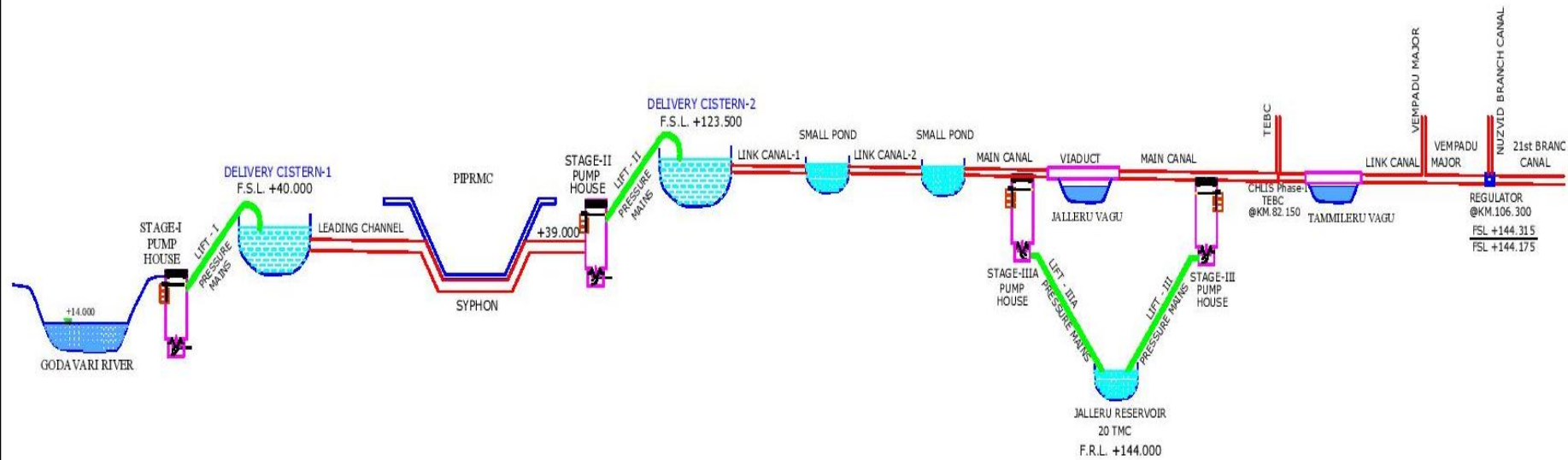
Location Map – CLIS





CHINTALAPUDI LIFT IRRIGATION SCHEME

LINE DIAGRAM



3.2 Details of alternate sites considered and the basis of selecting the proposed site, particularly the Environmental considerations gone should be highlighted.

3.2.1 Choice of the Project Site

The Chintalapudi L.I. Scheme is meant to provide irrigation facilities for the following areas

| S No. | Name of the district | Details of proposed mandals to get benefitted |
|--------------|-----------------------------|--|
| 1 | West Godavari | 1).Buttayagudem 2). Jeelugumilli 3). Koyyalagudem 4).T. Narsapuram 5). Denduluru 6). Pedavegi 7). Devurapalle 8). DwarakaTirumala 9). Gopalapuram 10). Nallajerla 11).Jangareddigudem 12). Chintalapudi 13)Kamavarapukota 14.Lingapalem 15) Pedapadu |
| | | 1. Vissannapeta 2. A.Konduru 3. Tiruvuru 4. Gampalagudem 5. Reddygudem 6. Mylavaram 7. G.Konduru 8. Vijayawada 9. Ibrahimpatnam |

| | | |
|--|--|--|
| | | 10. Kanchikacherla 11. Veerulapadu 12. Bapulapadu 13. Gannavaram 14. Unguturu 15. Nuziveed 16. Agiripalli 17. Chatrai 18. Musunuru |
|--|--|--|

Mandals of West Godavari and Mandals of Krishna districts, where there is an immediate need. Various alternatives are examined for location of pump houses, pressure mains and Canals to convey waters from river Godavari to upland areas of the above mandals.

3.2.2 Alternatives of the Project

By conducting preliminary and reconnaissance surveys, a suitable location has been finalized at 27.20 km on AGRB near Tadipudi village, Tallapudi mandal, West Godavaridistrict against which the first site is proposed now at Tadipudi (V) at 28.50 km of Akhanda Godavari right Bank to reduce the length of costly pressure main by 0.20 km and also avoids village habitations of Pochavaram and Tupakulagudem Village.

3.2.3 Reasons for the choice of the layout of the project

In this vicinity, a number of sites have been investigated. The present site is selected because of the following advantages.

- i) The pump house and the feeding units can be located without hindrance to the busy localities such as Kovvur and other valuable lands.
- ii) Taking of waters through pressure main and through open channels is more feasible.
- iii) The length of pressure main (which is the costliest item) is to minimum possible extent.
- iv) Good foundation soils required for structures are available.

3.3 Size or magnitude of operation

The proposed project provides drinking water to the about 25.94 lacks population and One of the special features of the scheme is that the entire ayacut of 1,94,253 Ha (4,80,000 Ac) is already under cultivation either from the insufficient waters from tanks and canals under NSP left canal or entirely depending upon the rain fall. Out of the proposed 1,94,253 Ha (4,80,000 ac), an extent of 8200 Ha (20262 ac) is already under paddy cultivation under tanks and 41375 Ha (102237 ac) is in dry crops purely depending upon rain fall. The ayacut under tanks required fifty percent supplementation. The remaining ayacut is situated beyond the periphery of tanks ayacut and as such irrigation for dry crops like chilies, Groundnut and Maize is proposed.

3.4 Project description with process details (a schematic diagram/flow chart showing the project layout, components of the project etc. should be given)

The daily requirements for the command area with pumping are calculated for the crop period from July to October. The daily surplus waters spilling over the existing Sir Arthur Cotton Barrage were also computed. The working tables for utilization of the surplus waters are prepared for a period of 54 years i.e. from 1962 to 2015. The overall dependability of the scheme works out to be 76.32%. However it is observed that the scheme achieves 97% to 100% during the months of August, September and October where the pumping of water is 90 days only. This small percentage of failure in non-surplus days can be taken care by utilizing the stores water from the Balancing Reservoir (Jalleru Reservoir)

Since it is a pumping scheme, the terminology has been suitably changed relevant to the pumping schemes.

a) Pump House: One pump house proposed at 27.20 km of Akhanda Godavari Right Bank on U/s of S.A.C Barrage, the pump house is located very near to the water course of River Godavari to draw the water directly into the sump by providing a suitable groine.

The sill level of both of the Pump houses is +10.00 m. The size of the pump house is 130m x25 m. Each pump draws 14 cumecs (494.41 cusecs) through open channel from the river Godavari. The bottom levels of sump of Pump House are to be +7.50 m to have a clear depth of 2.50 m for better performance of the vertical turbine pumps. The bottom level of foundation of sump will be

proposed at (-) 3.50 m, where the hard strata met. It is not possible to lay raft for construction of pump house at that level. Hence pump house is proposed to construct by diaphragm wall. The foundation pump house accommodates 18 Nos. vertical turbine pumps with each pump of capacity 6390 HP. The floor level for both of the pump houses is +22 m.

b) Leading channel: The water drawn from the pump house will be lifted from +12 m to +40 m into the delivery cistern and runs for a length of 13.22 km in new alignment and then across the alignment of Polavaram Irrigation Project right main canal at 14.56 km.

c) Main Canal: The water drawn from the 2nd stage pump house will be lifted from +40 m to +123.25 m into the delivery cistern and runs for a length of 106.300 km .The bed level, F.S.L. and T. B.L. of main canal at delivery cistern are +116.800,+123.50,+124.25 m respectively.

d) Storage Reservoir: Two lifts in STAGE-III are proposed at 30 & at 33 km on main canal to deliver the water into the Jalleru reservoir for storage and Irrigation.

e) Pumps, Motors and other accessories: All the pumps and motors in the pump house of Stage-I, Stage-II, Stage-III are proposed to be erected for the design floor levels.

f) Pumps for Main canal and pressure main: A pump house and 18 Nos of vertical turbine pumps each of capacity 6390 HP are proposed of diameter 3.2m to deliver a discharge of 194.52 cumecs (6862 Cusecs) by lifting water from +14 m to +40 m with a total static head of 26.00 m into Leading channel. The length of the pressure main is 3.0 km. Since the pressure main is subjected to a pressure ranging from 2 to 6 kg/cm², M.S concrete pipes are proposed. As per the practice, these pipes are manufactured in lengths of 4 to 6 m. They are coupled by socket and spigot joint. High stiffened flexible rubber ring is provided between male and female ends to arrest the leakage. Every row of the pressure main is provided with the required zero velocity valves and Air cushion valves at suitable locations to safeguard the pipes from water hammering. The entire pressure main will be resting on a 450 mm thick sand cushion and all the pipes will be buried with a minimum soil cover of 1000 mm

g) Sub-Stations: The Peak demand of electrical power for is 396 MW. It is proposed to provide a separate 132/33KV lines from Sub Stationn which is to be constructed at Guddigudem Village and from Exisiting Kamavarapukota Sub-station.

h) Tanks and Balancing Reservoirs: Jalleru Balancing reservoir was proposed with storage capacity of 20.5 TMC which is 60% of total demand in a year that can be safely be stored in reservoir.

i) Canal: The main canal of length 106.30 km discharging 194.52 cumecs (6869.50 C/S) is proposed. The ayacut proposed under the main canal is 1,94,253 ha (4, 80,000 Acres). Drinking water facility is provided to a population of 25.94 Lakhs in 410 village's enroute at the rate of 140 liters per capita per day.

j) Formation of Jelleru Reservoir

The scheme also envisages formation of balancing reservoir to store 20.50 TMC of water by 3rd stage lift near Rowthugudem village West Godavari district.

3.5 Raw material required along with estimated quantity, likely source, marketing area of final product/s, mode of transport of raw material.

Field investigations for construction materials prior to construction of the scheme are chiefly confined to sand, stone for masonry. Rough stone for dry packed revetments and for aprons, coarse aggregate for plain and reinforced cement concrete and gravel for protection works. From the available deposits in the proximity of the proposed scheme, the sources are selected keeping in view the physical characteristics and composition etc. required as per Andhra Pradesh standards specifications. The other materials such as cement, steel, wood, A.C. sheets, shell lime, bricks, gravel and reinforced cement concrete Hume pipes etc. are proposed to be procured from the reputed companies, confirming to Andhra Pradesh detailed standard specifications.

3.5.1 Soil and Rockfill

Soils for Jalleru reservoir will be collected from the submergence area for forming the earth bund.

3.5.2 Sand

Clean, sharp, angular type fine aggregate (resulting from natural disintegration of rock which has been deposited by river Godavari on its right bank composed of hard silicon material and free from deleterious materials satisfying Andhra Pradesh standard specification No.110) is available

in large quantities near Prakkilanka village which is about 3 km from the head works of the scheme.

3.5.3 Rock and Aggregates

Good variety of “H.G. Metal” which forms good stone confirming to Andhra Pradesh standard specifications No.107 is available at Duddukuru Village, 21 km from Head Works. Bulk quantity of the stone in these quarries is already utilized for the construction of irrigation works. Sufficient quantity is available for actual utilization on R.C.C. & C.C works of the present scheme. Alternative source that is found to be suitable for revetment and apron is selected from Tupakulagudem village, which is about 5 Km from the Head Works. This stone falls under the category other than granite variety and the quarry is an approved one by R&B department and Irrigation. Depending upon the necessity, this stone will be utilized for dry packed revetment works of the canal of the scheme.

Stone for concrete and for reinforced cement concrete works

Coarse aggregate of hard broken granite of different sizes, for CR Masonry and R.R. Masonry is available at Katheru at 36 km from Head Works in plenty and the same is selected for construction of C.R. Masonry and R.R. Masonry.

3.5.4 Common burnt clay bricks

The bricks shall be hand or machine molded confirming to specification No. 102 of Andhra Pradesh standard specifications. Best quality of bricks are available at Bobbarlanka(v). The same is proposed to be used for the project works.

3.5.5 Puzzalona

Puzzalona are not proposed for the works of the scheme, if any other material such as G.I. Pipes, pipe specials etc. are required in small quantities, they shall be purchased from the local marketing agents of approved manufacturers.

3.5.6 Cement

Port land cement confirming to I.S269-1967 is proposed to be procured from the reputed manufacturing companies in A.P.

3.5.7 Steel for reinforcement

Various types of steel conforming to relevant I.S. specifications as per table 126-A of Andhra Pradesh standard specifications are proposed to be procured from stock-yard of Vijayawada of steel Authority of India limited.

3.5.8 Scarce Material

Wood, Asbestos Cement Sheets, Shell lime etc.

Best variety of wood (Teak or country), Asbestos Cement sheet and shell lime will be selected and purchased from local market for utilizing the same for project as the quantity required is small.

Gravel

Best quality of gravel is available at Gajjaram, at a distance of 2 km from Head Works. This is an approved quarry and being used for all works of Construction Circle and Irrigation Circle, Eluru and for all other Engineering Departments. Hence, the Gravel from this quarry is proposed for the works of the scheme.

Mild steel pipes

MS pipes with required size and strength to withstand the designed pressure are proposed to be procured from nearest reputed manufactures at Hyderabad at a distance of 422 km from Head Works.

Reinforced cement concrete Hume pipes

Reinforced cement concrete Hume pipes of required size and strength to withstand the designed pressure are proposed to be procured from reputed manufacturers at Kovvuru, Nidadavolu etc.,

Mechanical and Electrical Equipment

The mechanical and electrical equipment such as pumps, motors, switch gear arrangements, cables and equipment required for electrical sub stations etc. required for the scheme will be procured duly calling tenders from technically qualified reputed firms.

3.6 Hydrology

Godavari is the second largest river draining in India. It originates near Triambakeswar in Maharashtra and flows for a length of 1465 km before joining the sea in between East & West

Godavari districts of Andhra Pradesh. Every year on average about 3000 to 4000 TMC of Godavari flood water goes in to sea as waste. The River Godavari is the main source of the present proposed Lift Irrigation Scheme.

Table 1 Water Requirement for CHLIS

| No. | Name of the Project | Discharge Required in Cumecs | Utilization in TMC |
|--------------------------|--|------------------------------|--------------------|
| 1 | Kovvada Project (0.40 TMC) | 1.45 | 0.40 |
| 2 | Ayacut considered in Upland areas of west Godavari District including feeding of Jalleru Reservoir | 83.35 | 23.50 |
| 3 | Yerrakalva Project (1.25 TMC) | 4.56 | 1.25 |
| 4 | Tammileru Project (1.25 TMC) | 4.56 | 1.25 |
| 5 | Ayacut of 21st Branch Canal of NSLBC and Upland areas in Krishna Districts | 100.6 | 27.10 |
| Total Requirement | | 194.52 | 53.50 |

As per the Bachawat award on distribution of water among the states on River Godavari, the balance water up to Sri Rama Sagar (Pochampadu) Project belongs to that project and the balance water below that project can be used by the combined Andhra Pradesh. The requirement of the existing, ongoing and future projects in the combined Andhra Pradesh is shown below.

Table 2 Water requirement of Existing, Ongoing & Future Projects

| No. | Name of the project | Discharge Required in Cusecs |
|--------------------------|---|------------------------------|
| 1 | Pranahita-Chevella Lift Irrigation Scheme at Tummidihetti | 20,765 |
| 2 | Godavari Lift Irrigation Scheme(Devadula) | 5000 |
| 3 | Yellampalli | 5000 |
| 4 | Rajiv Sagar and Indira Sagar Lift Irrigation Scheme | 1,600 |
| 5 | Polavaram Irrigation Project | 35,000 |
| 6 | Torrigedda Lift Irrigation Scheme | 180 |
| 7 | Chagalnadu Lift Irrigation Scheme | 232 |
| 8 | Sir Arthur Cotton Barrage | 10,000 |
| 9 | Other Lift Irrigation Schemes | 353 |
| 10 | Chinthalapudi Lift Irrigation Scheme | 6,870 |
| Total Requirement | | 85,000 |

The water flow recorded in the Godavari River Since 1978 at Dowlaiswaram indicates that more than 85,000 cusecs of water flow was recorded for 90 days, more than 50,000 cusecs was recorded for 108 days and more than 25,000 cusecs was recorded for 144 days in a year.

As seen from the above, there will be sufficient flood water in Godavari River for Chintalapudi lift irrigation scheme to Lift 6,870 cusecs (194.52 cumecs).

The scheme is a major irrigation one benefiting an ayacut of 1, 94,253 Ha (4,80,000 Acres). The type of project is Lift irrigation scheme. The ayacut of the entire scheme will be covered in upland area (+40 to +120 m) and present proposal is to derive early benefits. The source of pumping to feed the ayacut is from the river Godavari and as an alternative surplus waters spilling over the Sir Aurthur Cotton Barrage are proposed to be utilized. Thus the Hydrological studies are confined to assess the availability of surplus waters and elevation from which these waters can be tapped. The pond levels on the river Godavari over years and the surplus waters passing across the barrage over the years are also maintained by the irrigation circle, Dowlaiswaram. This data is processed to establish the feasibility and success of the scheme.

The demand of Chintalapudi LI scheme is 1515 M Cum (53.50 TMC) only, while the surplus waters of the river are plenty.

No Pumping will be permitted upstream of Sir Arthur Cotton Barrage from December till the month of May to protect the interests of the ayacut of Godavari Delta. Therefore, lifting the water is proposed in between June to November (in 90 Flood Days)

3.7 Cost and Benefits of the Scheme

The estimated cost of the project works out to Rs.4909.80 crores. The scheme provides Irrigation facilities to an extent of 1,94,253 Ha (4,80,000 Ac) by main canal. This includes the stabilization to an extent of 8,200 Ha (20,262 Ac) now under paddy cultivation entirely depending upon rain fall and rest of the 72,739 Ha (1,79,738 Ac) under irrigation for dry crops in West Godavari District. Stabilization of 70,000 acres in medium irrigation projects ayacut and 2.10 Lakh acres under 21st branch canal of NSLBC in Krishna district.

3.8 Environmental and Ecological Aspects of the Project

This is a pumping scheme and therefore there is no submersion of land and no rehabilitation of persons. No forest land is involved. The ground water tables will marginally be increased in the command area and there will not be any water logging effects in the command area since the entire command area is generally sloppy. The construction of the project will not have any adverse effect on the health of the people of the Villages in the area.

The project is proposed to be completed in three years. During all these three years, it will provide continuous employment for skilled, unskilled workmen of the locality. If the required workmen are not available, they will be imported from other places.

With the assured water supplies, the marginal farmer will be able to obtain financial assistance from Government Agencies like D.R.D.A, I.T.D.A, NABARD and other commercial banks to improve the methods of agriculture and the yields. With the improved financial conditions, young and enthusiastic farmers will establish industries based on agricultural requirements. Thus the completion of the project will help an all-round development of the area and prosperity of the people.

4. SITE ANALYSIS

4.1 Connectivity

The head works located near Tadipudi village of Tallapudi mandal of West Godavari district. Andhra Pradesh. The site is situated at a distance of 20 km from Kovvuru and 30 km from Rajahmundry town. The nearest town is Kovvuru which is well connected with neighboring district capital and towns by road and railway line.

4.2 Topography

The site now suggested for locating the pump houses has excellent facilities to locate a pumping scheme of present magnitude at a relatively cheaper cost. The site is situated at 27.20 km on Akhanda Godavari right bank near Tadipudi village of Tallapudi Mandal. The soil of the command area consists of mainly red soils and black cotton soils. Jalleru Reservoir was proposed in command area so that they can be used as Balancing Reservoir to feed the command area in case of Power failure or trouble in the performance of Motors.

The command area is gradually, sloping with vegetation and cultivable patches of sand, Sandy loamy, red soils with patches of Black cotton are the main soils met within the command area. The command area is tolerably plain with few mounds of high grounds.

The command area covering in 33 Mandals is in the Central western side of the West Godavari and Krishna Districts. Topography of the area is gradually modulating with an elevation difference of 20 to 30 m. Four major streams namely Jalleru, Bineru, Yerra Kalva and Thammileru flow through the command area.

4.3 Existing Infrastructure

4.3.1 Railways and Roads

The nearest Railway Station is Kovvuru Railway Station on Chennai Howrah Railway line which is at a distance of 20 km. The command area is also served by a number of roads out of which Eluru to Rajahmundry being Major District Route is an important one. Every village is connected either by metal road or by B.T. Road.

4.3.2 Marketing Facilities

There are marketing centers at all Mandal Head Quarters and they are connected to the major marketing centers like Rajahmundry, Jangareddigudem, Tadepalligudem, Nuziveed, Tiruvuru, Vijayawada etc. There is one sugar factory at Taduvai at present in the command area. Improved economic condition will give rise to new entrepreneurship to establish agricultural industries.

There are a number of commercial and Co-Operative Banks in the command area, besides the availability of series of public agencies like D.R.D.A, ITDA, and NABARD for credit facilities besides private financial agencies to extend credit facilities.

4.4 Soil Classification

The Canal under the Chintalapudi L.I Scheme from 0.00 km to 106.30 km for which soil sample tests have already been done and as per soil survey report from 0.00 km to 106.30 km most of the soils are Red soils, murrum with clay and Hard disintegrated Rock. Soil survey for earthen bund of Jelleru reservoir is conducted and tested in the laboratory and the soils are All Soils up to certain depth after that Murrum and Sand Stone exist. The Sub soil strata encountered along the alignment is varying from Mandal to Mandal.

The soils met with along alignment of main canal are generally red earth and red stiff clay. In some places, hard gravel, S.D.R., H.D.R, F&F and H.R are met with. The reach wise classification is as follows.

Table 3 Reach wise Soil Classification

| Reach | From Km | To Km | Soils met with |
|--------------|----------------|--------------|-------------------------|
| Reach I | 0 | 30 | All Soils, HDR, F&F, HR |
| Reach II | 30 | 32.975 | All Soils HDR,F&F |
| Reach III | 32.975 | 82.15 | All Soils HDR,F&F |
| Reach IV | 82.15 | 95.00 | All Soils HDR,F&F |
| Reach V | 95.000 | 106.300 | All Soils HDR,F&F |

4.5 Climatic data from secondary sources

The Chintalapudi L.I. Scheme project command areas are lying in 15 mandals in West Godavari District and 18 mandals of Krishna Districts which are coastal districts of Andhra Pradesh. The general climate in this Region is characterized by the hot summer and general dryness except during the south-west Monsoon.

4.5.1 Temperature

The mean annual temperature ranges from 12.6°C to 38.44°C . During January, this may be taken as representative of the winter months, the mean daily Temperature ranges from 12.6°C to 29°C . During April, which may be taken as representative of the summer months, the mean daily temperature ranges from 27.8°C to 38.44°C . During August, which may be taken as representative of monsoon months, the mean daily temperature ranges from 28.3°C to 29.6°C .

4.5.2 Evaporation

Observed data for evaporation is not necessary for the purpose of Hydrological studies, since this is a pumping scheme and no storage work is formulated. However, the evaporation losses considered similar to that of neighboring catchment of Chagalnadu L.I .Scheme at Rajahmundry (Institute of Meteorological Dept.), Katheru which is nearer to the Head works are taken as detailed below.

| | | |
|-----------|---|-----------------|
| July | : | 205mm (0.67 ft) |
| August | : | 173mm (0.57 ft) |
| September | : | 159mm (0.52 ft) |
| October | : | 171mm (0.56 ft) |
| November | : | 168mm (0.55 ft) |
| December | : | 164mm (0.54 ft) |
| January | : | 153mm (0.50 ft) |
| February | : | 170mm (0.56 ft) |
| March | : | 222mm (0.73 ft) |

| | | |
|-------|---|-----------------|
| April | : | 256mm (0.84 ft) |
| May | : | 328mm (1.88 ft) |
| June | : | 265mm (0.87 ft) |

These values are adopted in the calculation of Net water demand.

4.5.3 Rainfall

The command area is under the influence of rain gauges at Polavaram, Kovvur and Tadepalligudem. Rain fall is mainly from South-West monsoon. Out of a total Rainfall of 1959 mm, 1515 mm, is from South-West monsoon, and 312 mm from North- West monsoon and the rest 132 mm is during hot weather & winter periods. Monthly Rainfall particulars of above rain gauge stations from January to December are available from 1993 to 1999.

4.5.4 Humidity

The mean relative humidity varies from 91% to 46%.

4.5.5 Cloudiness

The sky will be cloudy during the monsoon period and rapidly decreases in post monsoon season. During the rest of season, the sky will be generally clear except very rarely now and then lightly clouded.

4.5.6 Winds

The winds are generally light to moderate with some strengthening force during the latter part of summer and during the monsoon seasons and ranging from 8.46 to 3.35 kmph.

4.5.7 Special Weather Phenomena

Storms and depressions originate in the Bay of Bengal in the post south-west monsoon season, which cross the coast and affect the weather over the command area causing wide spread heavy rains. Storms during North-West monsoon season normally from October to December cause wide spread Rains in the command areas.

5. PLANNING BRIEF

5.1 Population Projection

The proposed scheme is to be completed in a period of 18 months from after Environmental Clearance granted. The work is proposed to be carried out through contractors under departmental supervision i.e under a Chief Engineer, Godavari Delta System at Dowalaiswaram and an Executive Engineer, Jangareddigudem. It is estimated that the project requires 394520 number of man-days including both skilled and non-skilled category.

5.2 Amenities/Facilities

Proper site services such as Canteen / Rest Shelter, First Aid, Drinking Water, etc. will be provided to the construction workers. Various facilities to be provided during construction and operation of the project are as follows:

1. Electricity will be provided by transmission lines and DG sets.
2. Drinking water will be provided to the workers by Tankers during construction.
3. To provide the first aid for any sort of injuries encountered during the construction, one small first aid room will be provided. First aid kit and sufficient stock of material / medicines needed for first aid shall be provided as per requirement.
4. In future if women workers are employed, arrangement for a small crèche will be made as per the requirement.
5. Necessary arrangement will be made for conducting refresher course as laid down in vocational training rules to upgrade skills of the persons involved in the project.

6. INFRASTRUCTURAL FACILITIES

6.1 Green Belt

For the proposed project 9560 acres forest land is required for that Compensatory Afforestation will be done over equal non-forest land (NFL) identified for compensatory afforestation. At least 1000 saplings per hectare will be planted. If it is not possible to plant these many seedlings in the identified non-forest land, the balance seedlings will be planted in degraded forest land.

6.2 Drinking water management (source & supply of water)

Safe drinking water will be provided at site during construction phase from Godavari River.

6.3 Sewerage System

The sewage generated from the labour camps shall be treated in the Septic Tank and Soak Pits designed and constructed as per IS 2470 Part-I and Site selected for habitation of workers will be so selected that pollution can be kept minimum. The debris/waste during construction phase will be disposed as per standard procedure.

6.4 Solid Waste Management

Waste materials i.e. scraps, inert concrete waste and plastic waste generation is envisaged. These waste materials will be separated at source and then collected in suitable bins. Covered trucks shall be put in place for collection of these waste from different locations and transfer it to disposal site. Various disposal options i.e. landfill waste to energy or incineration etc. are available. This will be studied in detail during preparation of EIA/EMP report.

6.5 Power Requirement & Supply/Source

During the execution of the proposed project, the power required can be met from JENCO, which is having a well-connected network with Nidadavolu substation. By optimal planning and utilization of power resources, the adverse impacts on the environment can be minimized during construction and operational phase.

7. REHABILITATION AND RESETTLEMENT (R & R) PLAN

7.1 Policy to be adopted (Central/State) in respect of the project affected persons including home oustees, land oustees and landless laborers (a brief outline to be given)

Total required land is 22683 acres in that forest land is 9560 acres and non-forest land is 13123 acres. Land required for the project has acquired as per the “ The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013”.

7.2 Affected Population

The scheme is mainly a lift irrigation scheme, where water is pumped from River Godavari and as such there is no submersion except in storage reservoir (Jelleru Reservoir) which is formed across the Jelleru stream. Eight number villages are submerged and a population of 4366 tribals is affected by the Scheme. Submergence area of land is 12336 acres. In addition the above, acquiring of land to an extent of 3237.56 Ha (8000 Ac) for the purpose of construction of pump house, feeding units, main canal and Branch canals is envisaged. The details of affected population are appended in the Annexure-7.

8. PROJECT SCHEDULE & COST ESTIMATES

8.1 Likely Date of Start of Construction and Likely Date of Completion

As soon as the EC granted, immediately work will be started and it will be completed in 18 months.

8.2 Cost and Benefits of the Scheme

The estimated cost of the project works out to Rs.4909.80 crores. The scheme provides Irrigation facilities to an extent of 1,94,253 Ha (4,80,000 Ac) by main canal. This includes the stabilization to an extent of 8,200 Ha (20,262 Ac) now under paddy cultivation entirely depending upon rain fall and rest of the 72,739 Ha (1,79,738 Ac) under irrigation for dry crops in West Godavari District. Stabilization of 70,000 acres in medium irrigation projects ayacut and 2.10 Lakh acres under 21st branch canal of NSLBC in Krishna district.

9. ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

9.1 Financial and Social Benefits with Special Emphasis on the Benefit to the Local People Including Tribal Population, If Any, In the Area.

The inhabitants of the command area consist both tribal and non tribals. Non tribals are predominant. The main occupation of the people in this command area is agriculture and subsidiary occupation like collection of minor forest produce. Most of the agriculturists are non-tribals in the command area of the Polavaram Irrigation Project Right main canal. Fifty percent of agriculturists are small farmers and the rest are marginal farmers. Their annual income ranges from Rs. 10,000/- to Rs. 15,000/-per annum. The present scheme helps in promoting the economic and social wellbeing of the people of the area by affording assured water supply for irrigation and provides the drinking water nearly about 25.94 lacks population in the West Godavari and Krishna districts.

9.2 Conclusion.

The lift Irrigation scheme is proposed for the benefit of the small land holders living in 585 villages of upland and backward area of West Godavari and Krishna districts. The proposed project helps in providing assured water supply to the crops in 4,80,000 acres and the agricultural productivity will improve for up lift of the people who are below poverty line which will increase per capita income and thereby social situations in this area will be improved. The scheme also provides drinking water supply to a population of 25.94 lakhs people and their cattle living in 410 villages those are now in search of water during summer season to quench their thirst.