

KUTULISINGA IRRIGATION PROJECT
DETAIL PROJECT REPORT

1. INTRODUCTION:

1.1. Aim of the project

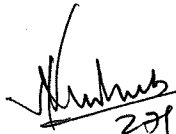
The Kutulisinga Irrigation Project is a reservoir project proposed in Mahanadi basin on Badajora nallah (Kutuli nallah) a tributary to river Sindholjhor near Kutulisinga RF & village Kutulisinga in Athmallik block of Angul district. The project envisages construction of a 323 m. long and 39.15 m. height earthen dam besides a central spillway proposed in the left flank of the river. This medium irrigation project will provide irrigation to 2540 Ha of CCA out of 3790 Ha GCA with annual irrigation of 3173 Ha in the draught prone areas under Athmallik Block.

1.2. Necessity of the Project

The project area comes under Athmallik block of Angul district, which is a draught prone area, chronically affected with frequent bouts of draught. The agricultural in this area completely depends upon the rainfall, which is not dependable because of wide temporal & spatial distribution. As a result, the agricultural production, is much below the average level. Agriculture being the main source of income, the per capita income of the people in this area is very low. So, the inhabitants of the locality are continuing with poor education, mal-nutrition and poverty. The construction of a dam across Badajora nallah (Kutuli nallah) and providing irrigation is absolutely necessary to improve the agricultural output and economy of the region to mitigate the misery of the population, mostly belonging to Schedule cast, Schedule tribe and backward class.

1.3. Location and Access

The project is located in Athmallik block of Angul district near Kutulisinga RF & village Kutulisinga at Latitude 20° – 47' – 56.01'' N and Longitude 84° – 41' – 34.38'' E vide Toposheet No. F45S9. An Index map showing location of the project is enclosed at **Plate-1**. The dam site, which is near Kutulisinga RF & village Kutulisinga is 65 kms. from Angul, the district headquarters, Angul. The National Highway-55 connecting Sambalpur and capital city of the state, Bhubaneswar. The nearest railway station of East coast Railways is Boinda 30 kms from proposed dam site. The dam site is 215 kms from the state capital and nearest airport, Bhubaneswar.


27/11/2020
Executive Engineer,
Cuttack Investigation Division
Jobra, Cuttack

1.4. **River & Basin**

The Badajora nallah (Kutuli nallah) is a tributary of the river Sindholjor, which falls into river Mahanadi. This nallah originates from the hill ranges of Tabada and traverses in the east-west direction and joins Sindholjor near Thakurgarh village before it out falls to river Mahanadi near the village Koandipaleswar.

1.5. **Catchment**

The project intercepts a catchment area of 83.30 sq. km at the proposed dam site. The catchment is fairly fan shaped and is bounded by steep hills and covered by thick forest. Badajora Nallah is a tributary of Sindholjor nallah joining it near Thakurgarh village. Sindholjor in turn joins the river Mahanadi on its left bank.

1.6. **Climate**

The climate of the zone is sub-tropical with three prominent seasons namely Summer (March to May), Rainy (June to October) and Winter (November to February).

1.6.1. **Temperature:**

The area belongs to the Sub – Tropical climatic zone. The average temperature in Summer is about 42° C and in Winter it is about 10°C.

1.6.2. **Rain fall:**

The most part of rain fall is received from South – West Monsoon, which occurs during the period from June to October and extending up to November. About 80% of precipitation occurs during these months. The average, maximum and minimum rainfall are 1990mm and 797mm respectively.

1.6.3. **Relative Humidity:**

The relative humidity is minimum in March and maximum in the month of August.

1.6.4. **Cloud cover:**

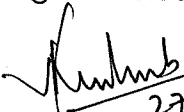
The maximum cloud cover is observed in the month of July & August and minimum cloud cover is observed in December & January.

1.6.5. **Topography:**

The ayacut is continuously sloping and has natural valleys. So, water logging is not anticipated after introduction of the irrigation to this area.

1.7. **Population**

The catchment area is thinly populated as the area lies in the hilly terrain. But the ayacut area is moderately populated. The growing population demands enhancement in the production of crops for betterment of their livelihood. Population is exposed to chronic draught conditions year after year and this project will serve the population by transforming the land from rain fed to irrigate. The people are gradually getting conscious regarding benefit of


27/4/2020
Executive Engineer,
Cuttack Investigation Division
Jobra, Cuttack

irrigation due to the success of major dam project in their near area. As per CENSUS-2011, the population of the area is 10094, which is again categorized as follows

- a. SC – 1217 nos
- b. ST – 1539nos and
- c. Others – 7378nos

1.8. Mineral Resources

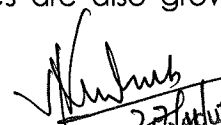
Though forest and water resources are in abundance, sub-surface mineral deposits are generally not found in this zone. Hence the area is very much deprived of industrial set up and the people mainly depend on agriculture for their livelihood.

1.9. Socio-economic Aspects

The inhabitants of this area mostly belong to schedule caste, schedule tribe and other backward classes. Economic status of most of the people lies below poverty line. Due to poor health and mal-nutrition, life expectancy of the people is much below the national average. Illiteracy among people is very high. All these factors like poverty, illiteracy, poor health, malnutrition leads to the continuous degradation of socio-economic condition of the command area people. The people of the command solely depend upon agriculture for their day to day livelihood. But the agriculture is subjected to ravages of nature in the form of drought due to erratic and uneven rain fall. The agricultural lands are fertile but due to lack of irrigation, the yield per hector is very low. The present land use practice is very primitive and traditional. The advanced technology of cultivation, tools & machines and cropping pattern is yet to be practiced as the erratic behavior of monsoon poses hindrances. Farmers provided with Govt. loans and subsidized tools & plants and seeds have tried so many times to forgo the traditional method but failed miserably due to lack of assured irrigation pattern. project will accelerate the growth of economy and improve socio-economic status of the backward classes. The reasons mentioned above coupled with direct or indirect employment potential of rural population with allowable B.C ratio justifies immediate implementation of the project.

1.10. Existing Agriculture pattern

The entire area of the proposed command area depends solely on rainfall. Therefore, crop diversification or cash crop is impossible to introduce in the command area at present. The local people are adopting the cropping pattern accordingly to the distribution of rainfall and availability of soil moisture as they depend upon rain only. Kharif Paddy is the principal crop of the area. Generally, local varieties of paddy of different duration with low yield are cultivated. Besides paddy, maize, pulses and vegetables are also grown in the up lands. Local varieties of seeds are generally used by farmers.


27/1/2025
Executive Engineer,
Cuttack Investigation Division
Debra, Cuttack

1.11. Existing Agriculture Practice

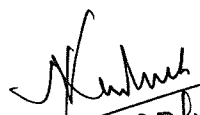
The present agricultural practice in this area is very primitive and undeveloped. Usually only one crop i.e. paddy is cultivated, almost in all the command area. The cultivation does not follow any crop calendar. No agricultural implements of sophisticated order are used nor are farm machineries in operation. Wooden plough, wooden planes and bullocks are used for tilling and leveling the lands. Chemical fertilizers are very rarely used in cultivation. Only cow dung used as manure, which is also not available sufficiently for the lands. Thus, the agriculture practice in the area remains primitive as was done years ago without any appreciable improvement. On implementation of this project, the cultivators will be more interested in adopting modern methods of agriculture, as there will be little chance of failure of crops. There will be variation in cropping pattern and change in agricultural practice will take place after availability of assured irrigation.

2. THE SCHEME:

The reservoir scheme envisages construction of a 323m. long and an earth dam of maximum 39.15m height having a central riverbed spillway of 39.00 m. length. The total catchment area at the dam site is 83.30 sq.km. The total inflow into the reservoir is 1994.85 ham corresponding to a 75% dependable year after deducting 20% utilization by the upstream and downstream stake holders. The project has an average water utilization of 75.57%. The proposed earth dam is a homogeneous section with provision of vertical chimney to drain the seepage water through the filter drains and rock-toe. The central spillway is Ogee crested type gated spillway is of 39.00m length. The crest level of the spillway is RL.193.00m with 3 nos. of 11m x 8m size radial gates. The spillway is planned to pass a design flood of 979.00 cumecs. The project will provide irrigation facility to 3790ha of GCA and 2540ha of CCA with annual irrigation of 3173ha.

Two main canals namely Left main canal & Right main canal, off take from the head regulator located on the left & right sides of dam axis respectively. The length of Left and right main canals are 11.344 km and 13.04 km. The design discharge of Left and Right main canals are 2.0 cumecs & 1.1 cumecs respectively. The full supply depth at the canal head for left & Right main canals are 0.65 m. & 0.95 m. respectively. The bed width of the left as well as the right main canal at the head reach is 4.0 m. The bed level for the left and right main canal at the head reach is 183.188 m. And 183.65m respectively.

Besides the above irrigation facilities, the project will also provide drinking water facility to 25,874 populations dwelling in the command area at a rate of 100 lpcd.


27/11/2020
Engineer,
Cuttack Investigation Division
Jobra, Cuttack

3. INTER-STATE ASPECT:

The catchment of Badajora nallah and the ayacut of the project lie entirely in the state of Odisha, although it is a tributary of the Sindhohor which is a tributary of Mahanadi, an interstate river. But it will use water for 83.30 sqkm downstream of Hirakud dam area out of the entire basin area of Mahanadi.

4. SURVEY & INVESTIGATION:

4.1. Topographical Survey:

The Engineers of the state have conducted following topographic survey.

4.2. River survey:

Survey for the longitudinal section of the river has been conducted for both upstream and downstream of the proposed dam site. River cross section survey has been completed for both upstream and downstream.

4.3. Survey of dam site:

Dam base survey has been conducted with a grid plan of 50m x 50m with contour interval of 1m covering an area up to 200m upstream and downstream of the dam axis.

4.4. Reservoir Survey:


The detailed reservoir survey was conducted with a grid plan up to MWL / FRL + 5m. A reservoir contour map has been prepared in the scale of 4" : 1 Mile with a contour interval of 2m. The map has also been prepared above an elevation of RL.206.000 m.

4.5. Main Canal Alignment Survey:

The ayacut of Hidising Irrigation project is available below 184.00m. Accordingly, FSL of the main canal has been fixed slightly above 184.00m at the head reaches and alignment survey of main canal and branch canals have been done for its entire length. The main canals off take from right & left side of the dam axis and the lengths of main canals are 13.04 km. and 11.344 km. respectively.

4.6. Hydrological survey:

The gauge and discharge observation data at Dam site has been recorded since 1980-81 and is being continued. Initially the yield series for Kutulisinga Irrigation Project was prepared basing on the observed gauge & discharge data of the GD site near Village Kundajhari. However, after discussion with CWC authorities, on the submitted feasibility report, yield series has been developed with the regression equations developed for the purpose thus generating uniform series date completely eliminating the observed series. The final yield series worked out by deducting 20% u/s and d/s requirements. Details on hydro metrological analysis are shown in Hydrology section of the project report.


27/11/2020
Engineer,
Cuttack Investigation Division
Jebra, Cuttack

4.7. **Meteorological Survey:**

There are three nos. of gauge station outside the catchment and ayacut area, and only one at Kundajhari which lies in the ayacut. As insisted by CWC during scrutiny of the feasibility report, the data of Kundajhari RG station, which are utilized for calculation of average rainfall of the catchment and the yield from the catchment has been checked for consistency with the three other neighboring rain gauge stations. The three nos of rain gauge stations are namely Kishornagar, Athamallick and Angul. The monthly normal rainfall has been furnished in the Hydrology section of this report. 80% chance of rainfall has been considered for calculation of the crop water requirement.

4.8. **Soil Survey:**

The soil survey of the ayacut in this project has already been taken up by soil and land use survey wing directorates of soil conservation, Odisha, Bhubaneswar. And they have already prepared the pre-irrigation soil survey report of Kutulisinga Irrigation Project. The soil group mostly come under irritability class-C 50% and irritability class-B 50%.

4.9. **Borrow area survey:**

Earth required for construction of Dam is available from the reservoir area. The soil samples from this reservoir area as well as from the proposed foundation base of earth dam have been tested, found suitable and accordingly the tentative design & drawing for earth dam section has been prepared.

4.10. **Survey for construction materials:**

Stone products required for the construction of structures in the project are available within a lead of 10 km from the dam site. Sand is available at a distance of 13 Km and quarried from the river Sindholjore. The principal construction materials such as sand and stone products have been sent to the CRO, Quality Control Laboratory, Cuttack for testing and the test results has been received. Cement and Steel will be carried to the site from the nearest stockyard. The lead for cement is 65km. That of steel is 215km.

4.11. **Geo-technical investigation:**

The sub-surface exploration and geo-technical investigation of Kutulisinga Irrigation Project were carried out long back in 1982-83 by Geologist Mr. Bandhopadhyaya fast of geologist Survey of India. during 2004-05 and 2006-07. The geological set up including the geological mapping of the area surrounding the dam axis has been done by him. Basing on his suggestion, the dam axis has been **shifted D/S by around 300 m. As the report revealed out of the two alignments, the first one is 80m. Shorter but results in an ideal length of 300m.** On left bank across the high granite hill. **The second alignment contains soil covered area in the right bank and rock slope in the left bank.** So, this site was found more suitable for

[Signature]
22/11/2018
Executive Engineer,
Cuttack Investigation Division
Cuttack, Odisha

construction of an earth dam. Taking the advantage of the rock slope of the left bank, the spill way from the central zone of the river to the left bank thus reducing the height for the spillway up to its crest.

Important joint directions along the dam axis are as follows.

- . N50 E-S 50 W-Low dip towards south &
- . N60W-S60E-Vertical dip
- . The foliation altitude varies between N to N 15 W and the dip varies from 75 westerly to nearly vertical. The drill hole has been made at 40m. Interval along the dam axis including the left flank and the right flank portion. The logging of the data has been ascertained and presented in his report.

5. HYDROLOGICAL STUDIES:

The details of hydrological analysis on yield, flood etc have been discussed in special chapter under "Hydrology" of this report. However, these are discussed in brief as below.

5.1. **Surface water:**

The surface run off is the product of basin characteristics, channel characteristics and climatic parameters such as precipitation, evaporation and transpiration. The present project proposes to utilize the surface run off only.

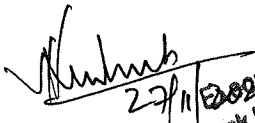
5.2. **Rain gauge stations and Rain fall data:**

There is one rain gauge stations, namely Kundajhari rain gauge station is laying in the command area. The rainfall data of the above stations have been employed for runoff determination. However, during compliance of the feasibility report as insisted by the CWC authorities, the rainfall record of the said station has been checked for consistency with three other nearby rain gauge stations ,namely Kishornagar, Angul and Athamallick and the missing non-monsoon rainfall records have been developed by taking average month to monsoon total ratio.

Accordingly, rainfall –runoff regression equations have been developed and submitted to CWC during compliance and the same has been accepted by CWC. The corresponding R-R equations have been discussed in subsequent paragraph 6.4 in this report.

5.3. **Gauge and Discharge observation and Run off computation:**

The gauge and discharge observation of Bauli nallah has been carried out at Karadasing since June 2005. The discharge observation data from 2005 – 2009 is too small a database for processing as hydrology supplementation. Therefore, this smaller data length has not been considered for yield study and the earlier approved yield series by CWC has been retained for the DPR also.


27/11/2025
Executive Engineer,
Cuttack Investigation Division
Jobra, Cuttack

5.4. Yield Series

The above equations are adopted to derive the yield series of this project from 1980-81 to 2007-08 and the 75% dependable yield comes to 1995.09 Ham after accounting for environmental reserves and upstream requirements.

5.5. Ground Water

The present proposal aims at utilization of surface water resources of the Badajora Nallah. Schemes for utilization of ground water of the basin are not considered in this report. The ground water observation in the ayacut shows the ground water table is much below the NSL. It is expected that small addition brought by irrigation water will not create any problem of water logging as the ground slope is steep enough for drainage and the soil is free draining.

5.6. Design Flood:

The design flood is calculated by using "Synthetic Unit Hydrograph" method referring CWC guidelines for "Flood Estimation Report for Eastern Coast Region" for sub-zone three, using the stream and catchment area characteristics. A 24-hour design storm depth of 508 mm with a loss rate of 1.0 mm/hr has been adopted as per CWC guideline in the flood estimation report. A single bell distribution of rainfall excess has been adopted and when the UG is convoluted over the excess storm rainfall arranged in critical order and the peak of design flood hydrograph is found as 979 cumecs.

5.7. Sedimentation and Life of Reservoir:

In the absence of any silt data, it is assumed that in flow of silt into the reservoir will be 1.25-acre ft./ Sq. mile / Year (Khosla's Formula) of the catchment area. The life of the reservoir has been taken as 50 years. The total sedimentation in 50 years is 246 Ham and total volume of sedimentation in 25 years is 123 Ham.

6. RESERVOIR SUBMERGENCE:


The total area coming under reservoir submergence is 124.731 Ha. However, the submergence is not affecting any habitation. No village is coming under submergence. The submerged area however comes under reserve forest area.

6.1. Forest area:

The total forest area likely to be submerged due to pondage & Head work is 124.731 Ha.

6.2. Rehabilitation and Resettlement:

The Full Reservoir Level of the reservoir has been fixed at 201.00m. However no habitable areas are coming under submergence. Therefore, there is no necessity of any exercise to be undertaken for resettlement and rehabilitation.


27/11/2022
Executive Engineer,
Cuttack Investigation Division
Jodha, Cuttack

7. IRRIGATION PLANNING:

7.1. Main canal and Distribution system:

The main canals of this project are contour canals and off-take from right & left side of dam axis. The length of the right & left main canal are 11.344 km. & 13.040km. respectively. The BL of the Left & Right main canals are RL 183.188 & RL.183.65 m. respectively. The design discharges at the head reach are 1.1 Cumecs & 2.0 cumec respectively for the left & right main canals. Full supply level of both the Left & Right main canal at the head reach is RL.183.838 m and 184.6m. respectively. The full supply depths at the head reach of Left & Right main canal are 0.65 m. & 0.95 m. respectively. The bed width of Left main canal at the head reach is 4.0 m. and bed width of Right main canal is 4.00 m. Moreover, for both distribution systems there are 33 nos. of minors and sub-minors (Right main canals contain 18 sub-distribution systems linked to the main canal and the left main canal contains 15 sub-distribution system from the main canal) apart from 14 nos. of direct outlet from the main canal (eight outlets from the right main canal and 6 outlets from the left main canal). All the minors and sub-minors are ridge canals. The ayacut planning has been done for 40 ha. Blocks accommodating additionally the local topography.

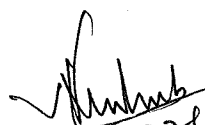
8. CONSTRUCTION PROGRAMME:

8.1. General:

The construction of Kutulisinga Irrigation Project will spread over 5 (five) years. At the end of five years, full potential will be created. Irrigation facility will however start after end of 3rd year, which the head works and 50% of canal system is expected to be completed. The period of five years for completion has been fixed taking into consideration the nature of work and desirability of achieving the quickest possible return on irrigation.

8.2. Dam and Appurtenant work:

All preliminary works such as Forest clearance, construction of camps and roads are proposed to be completed in the 1st year of construction. The land acquisition of head works will be over at the end of 1st year. Foundation excavation will start at the end of 1st year working season and will be completed by the end of 2nd year working season. The earth dam, central spillway and the head regulator are expected to be completed by the end 3rd year. The upstream riprap, down stream rock toe and toe drain will be carried out simultaneously as the earth work proceeds during the construction of earth dam. A total of five years has been fixed for full and final completion of the project such that from the very next year it will start yielding revenue.


27/11/2020
Executive Engineer,
Cuttack Investigation Division
Jodhpur, Cuttack

8.3. **Canal system:**

The preliminaries such as site clearance, construction of temporary and permanent camps including roads will be constructed in the 1st year of construction. The field alignment and land acquisition proceedings will start in the 1st year and will be completed by the end of 2nd year. Construction of structures will be taken up simultaneously with the earthwork of canal excavation from the end of 1st year and 50% of main canal with complete distribution system shall be completed by the end 3rd year, so as to give irrigation to portion of command area by the end of the 3rd year. The entire distribution system will be completed in all respect by the end of 5th year.

9. FINANCIAL ASPECTS:

9.1. **General:**

Kutulisinga Irrigation Project will provide irrigation to 2540 Ha of CCA. On its completion it will provide 3173 Ha of irrigation annually. The cost of the project is 7644 lakhs. The cost per Hectare of CCA is 3.00 lakhs. The cost of the annual irrigation is 2.41 lakhs per hectare.

9.2. **Water Rates:**

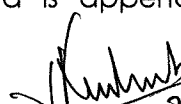
The water rates proposed to be collected is as per the existing rate of Department of Water Resources, Govt. of Orissa. The latest publication of water rates is on 5th April 2002 in the Odisha Gazette. Full water rate will be charged after creation of the irrigation potential. Imposition of water tax will be made gradual as the development will be gradual, since the cultivators will take time to acquaint themselves to the method of irrigation.

9.3. **Benefit Cost ratio & IRR:**

The Benefit Cost Ratio at 1.762. The Internal rate of return has been worked out to be 17.32% and the corresponding computations have been appended with this report. The State Finance Department shall be moved to accord necessary financial concurrence to the estimated value of the project.

9.4. **Financial Rate of Return:**

- i) The gross annual revenue return from irrigation at the approved water rate of the Govt. of Orissa, has been calculated for various year is appended with this report.
- ii) Works expenses: Interest on capital for the first 30 year at the rate of 5.5% has been taken into account with apportioned cost of interest during execution.
- iii) Net Annual Revenue: Net annual revenue for irrigation, which is calculated after deducting working expenses from the gross annual return has been tabulated for various years and is appended with this report. While


27/10/2018
Executive Engineer,
Cutback Investigation Division
Jobra, Cutback

assessing the net annual revenue the administrative charges at the rate of Rs. 600/- has also been accounted for apart from the cost of revenue collection charges.

- iv) Internal Rate of Return: Internal rate return has been calculated by iterative method and appended with this report. The internal rate of return is found to be 17.32%.

10. CONCLUSION AND RECOMMENDATION:

Kutulisinga Irrigation project will provide assured irrigation facility to 2158 ha in Khariff and 1015 Ha. in Rabi and also this project will provide drinking water facility to more than 25,874 population in the command area.

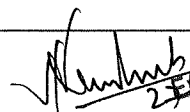
- i) The water utilization is 75.57%, Benefit cost Ratio is 1.762 and the Internal rate of return is 17.32% which are satisfactory.
- ii) Taking up the project and extending irrigation facility to the command will provide a scope of development to the undeveloped and poor people of Athamalik block.
- iii) This will upgrade the socio-economic conditions of the very distressed part of the society.
- iv) The available natural resource will also be utilized for the development. To bridge up the economic disparities as well as to add to the gross national productivity, the project should be taken up on a priority basis.

Component wise Break up of Forest & Non-forest Land required for Kutulisinga Irrigation Project under Athamalik Forest Division										
Sl No	Name of District	Name of Division	Name of Tahasil	Component	Forest Area		Non-Forest Area		Total Area	
					Acre	Hectare	Acre	Hectare	Acre	Hectare
1	Angul	Athamalik	Athamalik	Pondage & Head Work	308.210	124.731	0.000	0.000	308.210	124.731
2				Canal	67.950	27.499	63.300	25.616	131.250	53.115
3				Approach Road	4.180	1.694	0.000	0.000	4.180	1.694
4				Magazine House	0.400	0.160	0.000	0.000	0.400	0.160
Total Area					380.740	154.084	63.300	25.616	444.040	179.700

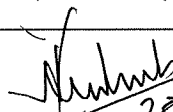
[Signature]
22/11/2020
Executive Engineer,
Cuttack Investigation Division
Jodha, Cuttack

SALIENT FEATURE

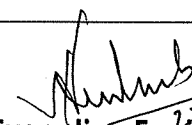
1.	GENERAL		
	i.	State	Odisha
	ii.	District	Angul
	iii.	Sub-Division	Athamallik
	iv.	Village	Kutulisinga
	v.	River	Badjore Nallah (A tributary of Sindolijhore)
2.	LOCATION		
	i.	Latitude	200-47'-34.38"
	ii.	Longitude	840-47'-56.01"
	iii.	Topo Sheet	F45S9
	iv.	Nearest Railway Station	Boinda
	v.	Nearest Airport	Jharsuguda
	vi.	Distance from State Capital to Project site	215Km.
3.	HYDROLOGY		
	i.	Catchment Area	83.30 Sq. Km.
	ii.	Rainfall	
		a) Maximum annual rainfall	2728.50 mm.
		b) Minimum annual rainfall	79.00mm.
		c) 75% dependable year rainfall	1115.71 mm.
		d) Net 75% dependable yield	1995.09 Ham.
		e) Design Flood discharge	979.00 Cumecs.
4.	RESERVOIR		
	i.	Gross storage at FRL	1806.00 Ham.


27/01/2025
Executive Engineer,
Cuttack Investigation Division
Jobra, Cuttack

	ii.	Dead storage capacity	200.00 Ham.
	iii.	Live storage capacity	1606.00 Ham.
	iv.	Full Reservoir Level	RL 201.00m.
	v.	Dead storage level	RL 182.00m.
	vi.	Top Bank Level	RL 204.00m.
	vii.	Submerged area at FRL / MWL	124.713Ha.
5.	DAM		
	i.	Type	Earth Dam
	ii.	Length of Earth Dam	323.00m.
	iii.	Maximum height	39.15m.
	iv.	Top width	5.00m.
6.	SPILLWAY		
	i.	Location and type	Central Spillway and Ogee Crest
	ii.	Length of Spillway	33.00 m.
	iii.	Crest Level of Spillway	RL 193.00 m.
	iv.	Size of Gate	11m x 8m
	v.	Total Length	39.00 m.
	vi.	Spillway Capacity	979.00 Cumecs.
7.	DISTRIBUTION SYSTEM		
	i.	G.C.A.	3790 Ha.
	ii.	C.C.A	2540 Ha.
	iii.	Percentage of CCA & GCA	67%
	iv.	Intensity of Irrigation during Kharif	81% (2158 Ha.)
	v.	Intensity of Irrigation during Rabi	40% (1015 Ha.)


 29/11/2022
 Executive Engineer,
 Cuttack Investigation Division
 Jobra, Cuttack

	vi.	Annual Irrigation	3173 Ha.
	vii.	Annual intensity of Irrigation	121%
	viii.	Length Main Canal on Right side	13.04 Km.
	ix.	Length Main Canal on Left side	11.344 Km.
8.	SUBMERGENCE		
	i.	Number of villages submerged	NIL
	ii.	Length of NH to be submerged	NIL
	iii.	Length of S.H. to be submerged	NIL
	iv.	Forest area required for Pondage & Head Work	124.731 Ha. (Reserved Forest)
	v.	No. of families affected	NIL
	vi.	Cultivated land Submerged	NIL
		a. Private Land	NIL
		b. Govt. Land	NIL
		c. Forest Land	124.731 Ha.
	vii.	Land required for Canal System	53.115 Ha.
9.	COST		
	i.	Cost of Head works	11,269.829 Lakhs
	ii.	Cost of Distribution system	11,834.018 Lakhs
	iii.	Total Cost of the Project	23,103.847 Lakhs.
	iv.	Cost per hector of annual irrigation	7,28,000.00


Executive Engineer
 Cuttack Investigation Division,
 Jobra, Cuttack
 22/11/2020