

Hidsing Irrigation Project Including Alternate Road (Peripheral Road)

1. Project Details: -

Short narrative of the proposal and Project/Scheme for which the Forest Land is requested: -

This proposal is for diversion of 87.520 Ha. of Forest land out of 437.330 Ha of total land required for Construction of Hidsing Irrigation Project including alternate road due to submergence of (Angul – Tikarapada Road) S.H 23. The Private Non-forest land 287.579 Ha + Govt. Non-forest land 62.231 Ha + forest land 87.52 Ha (Reserve forest 38.619 Ha + Revenue forest land 7.276 Ha + DLC forest land 19.55 Ha + Private forest land 22.075 Ha) Total 437.330 Ha of land involved for Construction of Hidsing Irrigation Project including alternate road proposed to be done across the river Bauli Nallah near Village Karadising in Brahmani Basin of Anugul Forest Division & Anugul District, by the Department of Water Resources, Govt. of Odisha. The Bauli Nallah is a major tributary of Lingara nallah joining near Ramkasinga. Lingara Nallah in turn joins the river Brahmani on its right bank near village Meramundali. The Bauli Nallah originates from hill ranges of Balanga in Angul Block of Angul District and traverses in the north-east direction. The Project includes a water reservoir with a homogeneous earth dam and a Central Spillway & 2 main (Right & Left) canals with Distributaries, Minors & sub minors & outlets from the main Canal & an alternate road (due to Submergence of Anugul - Tikarapada road S.H 23) has been provided. This project has been technically approved by the Central Water Commission, Govt. of India vide their letter no. M & A/AP-1/2012/13-15 dated- 04.01.2013 (Annexure-I).

2. SALIENT FEATURES OF HIDSING IRRIGATION PROJECT:-

1. GENERAL

i.	State	:	Odisha
ii.	District	:	Angul
iii.	Sub-Division	:	Angul
iv.	Village	:	Karadasing
v.	River	:	Bauli Nallah

2. LOCATION

i.	Latitude	:	20° – 43' – 00"
ii.	Longitude	:	84° – 58' – 30"
iii.	Topo Sheet	:	73H/2, 73D/14
iv.	Nearest Railway Station	:	Angul
v.	Nearest Air Port	:	Bhubaneswar
vi.	Distance from State Capital	:	180Km.
	To Project Site		


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3. HYDROLOGY

i.	Catchment Area	:	72.30 Sq. Km.
ii.	Rainfall		
	a) Maximum annual rainfall	:	2693.40mm.
	b) Minimum annual rainfall	:	769.00mm.
	c) 75% dependable year rain	:	1138.90mm.
	d) Net 75% dependable yield	:	1726.30Ham.
	e) Design Flood discharge	:	778.00 Cumecs.

4. RESERVOIR

i.	Gross storage at FRL	:	1765.58 Ham.
ii.	Dead storage capacity	:	245.30 Ham.
iii.	Live storage capacity	:	1520.28 Ham.
iv.	Full Reservoir Level	:	RL 228.00m.
v.	Dead storage level	:	RL 214.00m.
vi.	Top Bank Level	:	RL 231.00m.
vii.	Submerged area at FRL/MWL	:	324.95Ha.
viii.	Number of village submerged	:	2 Nos.
ix.	Length of NH to be submerged	:	NIL
x.	Length of S.H. to be submerged	:	3.65KM.
xi.	Forest area to be submerged	:	74.357 Ha.

5. SUBMERGENCE

i.	Number of village affected	:	3 Nos.
	Number of village fully affected	:	2 Nos. of village namely Hidising & Dimiripal.
	Number of village partly affected	:	1 Nos. a) Karadasing
ii.	Number of families affected	:	161 Nos.

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6. DAM

i.	Type	:	Homogeneous Earth Dam
ii.	Length of Earth Dam	:	933m.
iii.	Maximum height	:	32.50m.
iv.	Top width	:	6.00m.

7. SPILLWAY

i.	Location and type	:	Central Spillway and Ogee Crest
ii.	Length of Spillway	:	36m.
iii.	Crest Level of Spillway	:	RL 220.00m.
iv.	Size of Gate	:	10m x 8m.
v.	Numbers of bays	:	3 Nos.

8. DISTRIBUTION SYSTEM

i.	G.C.A.	:	3943 Ha.
ii.	C.C.A.	:	2958 Ha.
iii.	Percentage of CCA & GCA	:	75%
iv.	Intensity of Irrigation during Khariff	:	80%
v.	Intensity of Irrigation during Rabi	:	25%
vi.	Area to be irrigated during Khariff	:	2366 Ha.
vii.	Area to be irrigated during Rabi	:	740 Ha.
viii.	Annual Irrigation	:	3106 Ha.
ix.	Annual intensity of Irrigation	:	105%
x.	Utilization factor	:	77.52%
xi.	Length Main Canal on Right side	:	8.460Km.
xii.	Length Main Canal on Left side	:	17.700Km.
xiii.	Number of village to be benefitted	:	29 Nos.

9. COST

i.	Cost of Head Works	:	Rs. 16583.89 Lakhs
ii.	Cost of Distribution system	:	Rs. 7965.37 Lakhs
iii.	Total Cost of the Project	:	Rs. 24549.26 Lakhs


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iv.	Cost per hector of annual irrigation	:	Rs. 7.90 Lakhs
v.	B.C. ratio (10% rate of interest rate)	:	Rs. 1.53

3. Aim of the Project: -

The Hidising Irrigation Project is a reservoir project proposed in Brahmani basin on Bauli Nallah a tributary to river Brahmani near village Karadasing in Angul block of Angul District. The project envisages construction of a 933 m. long and 32.50 m. height earthen dam besides a central spillway proposed at the centre of river gap portion.

This medium irrigation project will provide irrigation to 2958 Ha of CCA out of 3943 Ha GCA with annual irrigation of 3106 Ha in the draught prone areas (Khariff Irrigation 2366 Ha and Rabi Irrigation 740 Ha) under Angul Forest Division in Angul Block.

4. Necessity of the Project: -

The project area comes under Angul block of Angul District, which is a draught prone area, chronically affected with frequent bouts of draught. The agriculture 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 area continuing with poor education, mal-nutrition and poverty. The construction of a dam across Bauli Nallah and providing irrigation is absolutely necessary to improve the agriculture output and economy of the region to mitigate the misery of the population, mostly belonging to Schedule cast, Schedule tribe and backward class.

5. Location and Access: -

The project is located in Angul block of Angul district near village Karadasing at Latitude $20^{\circ} - 43' - 00''$ N and Longitude $84^{\circ} - 58' - 30''$ E vide Toposheet No. 73H/2, 73D/14. An Index map showing location of the project is enclosed.

The dam site, which is near village Karadasing is 25 Kms from Angul, the district head-quarters, Angul. The National Highway - 55 connecting Sambalpur and capital city of the state, Bhubaneswar. The nearest railway station of East coast Railway is Angul 30 Kms from proposed dam site. The dam site is 180 Kms from the state capital and nearest airport, Bhubaneswar.

6. River & Basin: -

The Bauli Nallah is a tributary of the river Brahmani. This Nallah originates from the hill ranges of Balanga and traverses in the north-east direction and joins Lingara nallah before it out falls to river Brahmani near the village Meramundali.

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7. Catchment: -

The project intercepts a catchment area of 72.30 sq km at the proposed dam site. The catchment is fairly fan shaped and is bounded by steep hills and covered by thick forest. Bauli Nallah is a tributary of Lingara Nallah joining it near Rankasinga. Lingara Nallah in turn joins the river Brahmani on its right bank. For management of catchment area, Catchment Area Treatment (CAT) plan has been prepared and enclosed as Annexure-18.

8. Topography: -

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

9. 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 irrigation due to the success of Derjang dam project in their district.

10. Socio - economic Aspects: -

The inhabitant of this area mostly belongs 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, mal-nutrition 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 hectare 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.


15/6/19
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11. Topographical Survey: -

The Engineers of the state have conducted following topographic survey.

i. 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.

ii. 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.

iii. 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 231m for detailed information as per CHECK LIST S.No-27.

iv. Main Canal Alignment Survey: -

The ayacut of Hidising Irrigation Project is available below 213.700 m. Accordingly, FSL of the main canal has been fixed at 213.700 m. 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 8.460 km. and 17.700 km. respectively.

12. Hydrological Survey: -

The gauge and discharge observation data at Karadasing has been recorded since 2005 and is being continued. Initially the yield series for Hidising Irrigation Project was prepared basing on the observed gauge & discharge data for Sapua Badajore Project. However, after discussion with CWS authorities, nearby Derjang irrigation project was found more hydro meteorologically similar with Hidising. Hence, yield series has been developed with the observed data of Derjanga Irrigation Project with proportional catchment area for Hidsing Irrigation Project.

13. Meteorological Survey: -

There are (two) nos. of gauge station outside the catchment and ayacut area, the data of which are utilized for calculation of average rainfall of the catchment and the yield from the catchment. The two nos. of rain gauge stations are namely Derjang 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.


12/6/19
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14. Soil Survey: -

The soil survey of the ayacut in this project has been requested to be taken up by ORSAC, Bhubaneswar.

15. 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.

16. Survey for construction materials: -

Stone products required for the construction of structures in the project are available within a lead of 32 km from the dam site. Sand is available at a distance of 6 km and quarried from the river Mahanadi. 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 at Angul, which is 28 km. from the dam site.

17. Geo-technical investigation: -

The sub-surface exploration and geo-technical investigation of Hidising Irrigation Project were carried out fast 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 Assistant Geologist from Geological Survey of India, GOI. Basing on his suggestion, the dam axis has been shifted D/S by around 90 m. in order to take advantage of a large outcrop of granite gneiss (Strike E-W, dip 70° towards north) along the Nalla course, occupying the entire river width and continuing for few meters beyond the left bank. The drill holes have been made at 40 m. interval along the spillway axis and in the bucket portion. Along with logging of the data the ground water table has also been ascertained. 48 hours after completion of drilling, field permeability or water loss tests have also been conducted during the time of drilling. In each drill hole at 3 m. interval in accordance with the codal provisions of IS: 5529-1985. The test results as conducted and computed by MECON INDIA, Cuttack.

18. 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 477 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


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CUTTACK-7

storm rainfall arranged in critical order and the peak of design flood hydrograph is found as 778 cumecs.

19. 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 218 Ham and total volume of sedimentation in 25 years is 149 Ham.

20. Reservoir Submergence: -

The total area coming under reservoir submergence is 325.17 Ha. total 1 (One) no. of village Karadasing will be partially affected due to reservoir submergence and two nos. village namely Hidising & Dimiripal will be completely submerged.

There is no. N.H. Passing near by the project area. However a state highway namely SH - 23 is running between Angul to Tikarpada passes near by the Hidising Project. A portion of length of about 3.65 km. will come under reservoir submergence.

21. Forest Area: -

The Total 87.520 Ha forest land is involved in the project out of total area 437.330 Ha. (Reservoir 58.48 Ha + RMC 9.401 Ha + LMC 6.238 Ha+ Alternate Road 13.394 Ha). The total forest area likely to be submerged is 58.487 Ha. The enumeration of forest growth in the submerged area of the reservoir as well as canal system has been completed.

22. Rehabilitation and Resettlement: -

The Full Reservoir Level of the reservoir has been fixed at 228.00 m. hence; it is proposed to rehabilitate the population of submerged area below 228.00 m. contour. There are all-total 3 nos. of villages to be affected, out of which 2 nos. of village will be fully submerged, and one village is partly affected, the lists of which are given below.

Fully submerged villages

1. Hidising
2. Dimiripal

Partly Affected villages

1. Karadasing


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161 families comprising 63 no. of SC families, 12 no. of ST families and 86 no. General category families will be displaced/ rehabilitated.

They are to be adequately compensated for their loss of property (land, houses, and others), transported to a newly set up Resettlement colony with sustenance allowance, and other admissible benefits according to the State R & R plan.

R & R plan has been prepared for these oustee families as per the following policy guidelines, State R & R policy 2006 with amendments 2007 & 2009-10 issued by the Govt. of Odisha. The R & R plan is enclosed as **Annexure-19**.

23. 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 8.460 km & 17.700 km respectively. The Sill Levels of the Left & Right head regulator are RL 213.313 & RL. 213.513 m. respectively. The design discharges at the head reach are 3.623 Cumecs (2.442 cumec & 1.181 cumes respectively for the left & right main canals). Full supply level of both the Left & Right main canal at the head reach is RL. 213.700 m. The full supply depths at the head reach of Left & Right main canal are 0.95 m. & 0.75 m. respectively. The bed width of Left main canal at the head reach is 4.40 m. and bed width of Right main canal is 3.00 m. moreover, for both distribution systems there are 28 nos. of minors and sub-minors, apart from 11 nos. of direct out let from the main canal. All the minors and sub-minors are ridge canals. The ayacut planning has been done for 40 ha blocks.

24. Field Drainage: -

A net work of natural field drain is in existence, which are adequate for drainage works. All the natural drains are leading to the river. The main canal runs in contour and minors, sub-minors runs in ridges in a sloped ayacut towards the river. The area as observed from the GWL is free from drainage congestion. Taking into account this fact and the land topography & sandy nature of soil texture which is free draining, it is expected that providing irrigation facility by the project will not lead to drainage congestion.

25. Communication and Transport: -

A net work of internal roads will be made to connect quarries and borrow areas with all components of the project like dam, spillway, head regulator and canal system. The internal roads will also be connected to the project head quarters and staff colonies. It is proposed to construct one alternate road as a portion of 3.65 KM of Angul – Tikrapada Road will be submerged after completion of the Project.

26. Benefit Cost Ratio & IRR: -

The benefit Cost Ratio at 1.53 The Internal rate of return has been worked out to be 14.35% and the corresponding computations have been appended with this report. The state Finance


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Department shall be moved to accord necessary financial concurrence to the estimated value of the project.

27. Conclusion and Recommendation: -

Hidising Irrigation project will provide assured irrigation facility to 2366 ha in Khariff and 740 Ha in Rabi and also this project will provide drinking water facility to more than 10,000 population in the command area.

The water utilization is 77.52%, Benefit cost Ratio is 1.53 and the internal rate of return is 14.35% which are satisfactory.

Taking up the project and extending irrigation facility to the command area will provide a scope of development to the undeveloped and poor people of Angul block. This will upgrade the socio-economic conditions of the very distressed part of the society. 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.

Justification for locating the project in Forest Land and detailed alternatives examined:-

This project area comes under Angul Block of Angul District, which is a draught prone area, chronically affected with frequent bouts of draught. The agriculture in this area completely depends upon the rainfall, which is not dependence 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 Bauli nallah and providing irrigation is absolutely necessary to improve the agriculture output and economy of the region to mitigate the misery of the population, mostly belonging to Schedule Cast, Schedule Tribe and backward class.

Bauli nala is a tributary of Lingara River in the Brahmani Basin. The proposed Dam site near village Karadasing is site specific and technically ideal. Due to suitability of location and other conceptual advantage, as detailed below, alternative sites have not been explored during the engineering survey and investigation.

The gauge and discharge observation data at Karadasing has been recorded from 2005 to 2010 and found suitable. Initially, the yield series for Hidishig Irrigation Project was prepared basing on the observed gauge & discharge data for Sapua Badajore Project. However, after discussion with CWC authorities, nearby Derjang irrigation project was found more hydro meteorologically similar with Hidshing Irrigation Project. Hence, yield series has been developed with the observed data of Derjang Irrigation Project with proportional catchment area for Hidsing Irrigation Project.


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So a Dam Site has been selected near village Karadasing in Angul Block of Angul District, which is technically feasible and alignment of Canal system (1) Right Main Canal and (2) Left Main Canal (3) Alternate Road has been prepared for construction after alternate studies taken up to avoid/minimum use of forest land as well as home state land.

Not only the suitable location was considered and identified for construction of Dam, Canal system and alternate road but also it was emphasized to reduce destroying the cultivated land as well as virgin forest land. So in this case best site is selected for construction of Dam, Canal system and alternate road in technical point of view as well as barest minimum use of Forest Land.

Detailed alternate alignment route survey is given below: -

During walk over survey of the routes all possible alternatives has been explored to reduce the Forest land, avoiding thick populated villages, Dense vegetation, and found route no. 3 is suitable for this project.

Right Main Canal: -

Route No. 1: - Total length of the route is 10.05kms and total forest land is involved 14.29Ha. The Full Supply Level (FSL) is not acceptable as it is not economical as per the design parameter of the Reservoir and this route is providing less command area.

Route No. 2: - The length of the route is 9.98kms and total forest land is involved 10.14Ha. The Full Supply Level (FSL) is not acceptable, as it is not economical as per design parameter of the Reservoir and the route is providing less command area.

Route No. 3:- The length of the route is 8.460kms and total forest land is involved 9.401Ha. The Full Supply Level (FSL) is justified to have a maximum command area. From Geological Investigation, fresh out crop rock is available at the present site (Axis) and this route is considered feasible and appropriate.

Left Main Canal:-

Route No. 1: - The length of the route is 16.34kms and total forest land is involved 7.12Ha. The Full Supply Level (FSL) is not acceptable as it is not economical as per design parameter of the Reservoir and this route is providing less command area.

Route No. 2: - The length of the route is 16.35kms and the total forest land is involved 8.116Ha. The Full Supply Level (FSL) is not acceptable as it is not economical as per design parameter of the Reservoir and this route is proving less command area.

Route No. 3: - The length of the route is 17.700kms and the total forest land is involved 6.238ha. The Full Supply Level (FSL) is justified to have a maximum command area. From Geological Investigation,


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CUTTACK-7

fresh out crop rock is available at the present site (Axis) and hence this route is considered feasible and appropriate.

Alternate Road with alternate alignment:-

As a potation of 3.60kms length of Angul – Tikarapada Road is coming under Reservoir submergence, and it will disconnect Satkosia Tiger Reserve Project, so it is decided to select an alternate road which will connect the Satkosia Tiger Reserve Project. Accordingly an alternate road has selected from Karatapata – Pampasar which will connect to Satkosia Tiger Reserve Project.

During walk over survey of the routes all possible alternatives has been explored to reduce the area Forest land, avoiding thick populated villages, Dense vegetation, and found route no. 3 is suitable for this project.

Route No. 1: - The length of the route is 6.94kms and total forest land is involved 16.702Ha out of which 8.286ha is Reserve Forest and having dense forest growth.

Route No. 2: - The length of the route is 5.75kms and the total forest land is involved 14.447ha out of which 6.989ha is Reserve Forest and having dense forest growth.

Route No. 3: - The length of the route is 5.37kms and the total forest land is involved 13.394ha out of which 6.052ha is Reserve Forest having bushy forest growth only and crop density is less than 40%, so this route is considered feasible and appropriate.

After extensive exercise of the above 3 routes (Route-1, Route-2, & Route-3) are analyzed for construction of Canal System and alternate road of Hidsing Irrigation Project out of the above 3 routes. Route no 3 has been finalized for the following reasons.

1. The canal FSL (Full Supply Level) is justified to have a maximum command area.
2. If the axis is shifted to U/S side, then some habitants will be under submergence.
3. If the axis is shifted to D/S, then the FSL of canal will be decreased and hence a less in command area.
4. From geological Investigation, fresh out crop of rock is available at present site (Axis) and hence this route is considered feasible and appropriate.
5. In case of alternate road, less forest land is involved and road length is minimum and this project is economical.

Employment likely to be generated:-

In this project total 1000 no of persons will be engaged permanently /regularly and 3000 no of personas will be engaged temporarily. Total 28 no of villages will be benefited with population around 30000 nos.


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Total Land Required:-

As indicated in the project diversion proposal total an area of 437.330 Ha of land is required for construction of Hidsing Irrigation Project out of which 87.520 Ha of forest land is involved in this project Angul Tahasil of Angul district. The authenticated land schedule of total forest and non forest land involved in the project with Hal - Sabik status as on 25.10.1980 duly authenticated by the Tahasildar of Angul. The Authenticated Land Schedule is enclosed as Annexure - 3.

Alternate Road Breakup						
Sl. No	Village Name	Forest Area in Ha	Non Forest Area in Ha	Total (Forest & Non Forest in Ha	Tahasil Name	District Name
1	Dimiripala	0.262	0.000	0.262	Angul	Angul
2	Karadasing	5.963	0.590	6.553		
3	Karatpata	0.000	2.149	2.149		
4	Krishnachakara PRF	7.169	0.000	7.169		
Total=		13.394	2.739	16.133		

Component wise Break-up			
Sl. No	Component Name	Forest	Non - Forest
1	Reservoir Area	58.487	214.29
2	Right Main Canal (RMC)	9.401	20.247
3	Left Main Canal (LMC)	6.238	112.534
4	Alternate Road	13.394	2.739
Total Area		87.520	349.810
Total Area (Forest + Non-Forest)		437.330	

Flora & Fauna:-

The area has got only mild vegetation cover including limited common commercial species as listed below:

(i) Flora:**Table -4**

Common Name	Botanical Name
Sal	Shorea robusta
Bela	Agle marmalous
Halnd	Adina cordifolia


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Sisoo	Daldergia sisoo
Asan	Terminalia alata
Arjun	Terminalia arjuna
Acasia	Acasia auriculiformis
Ficus	Ficus bengalensis
Aswasth	Ficus religoisa
Gambhar	Gmelina arborea
Jamu	Engenia jambulana
Kendu	Diospyros melanoxylon
Karanj	Pongamia pinnata
Kasi	Bridelia retusa
Teak	Tectona grandis

(ii) Fauna:-

Common Name	Scientific Name	Schedule
Ratel	Mellivora capensis	I
Sloth bear	Melursus ursinus	I
Bilua	Canis latranus	V
Baraha	Sus crefa cristatus	III
Jhinka	Hystrix leucura	IV
Kokisiali	Vulpes bengalensis	II
Mankada	Semnopithecus entellus	II
Neula	Herpestes bengalensis	IV
Odha	Lutra lutra	III
Thekua	Lepus ruficaudatus	III

(i) **Density of vegetation:**

The area has mild vegetation cover. Plantation has been done in some patches of the lease hold and the Density of vegetation is below 0.4.

(ii) **Species wise and diameter wise abstract of trees:**

Tree Enumeration trees has been completed in the Reservoir & Canal System of Hidsing Irrigation Project and Abstract of tree enumeration is enclosed **Annexures-11, 12 & 13.**

Regarding Tree enumeration alternate road area will be submitted after completion of work.

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- (iii) Vulnerability of the forest area to erosion, whether it forms a part of a seriously eroded area or not:

The total forest within the project area is not vulnerable for erosion and also do not form a part of seriously eroded area, as there is very less impact on natural land use/ environment during & after construction work.

- (iv) Whether it forms a part of national park, wild life sanctuary, nature reserve etc, and if so, details of the area involved (Specific comments of the Chief Wild Life Warden to be annexed):

The area does not a part or not represent any national park or wild life sanctuary, National reserve, Biosphere reserve but it is within Eco Sensitive Zone of Satkosia Gorge Sanctuary/ Satkosia Tiger Reserved.

Whether clearance under Environment (Protection) Act, 1986 required?

Environmental Clearance:-

Environmental clearance is not required for this project as per MoEF, GOI Notification No.11013/56/2004-1A-II (I) dated 14th September 2006.

Compensatory Afforestation:-

An area of 94.216 Ha of Non Forest Land has been identified (MoEF & CC GOI guideline No. F.No. 11-423/2011-FC, dated 8th November 2017) in village Baradiha, Tanugola, Kadambinipur under Pallahara Tahasil of Deogarh District within the jurisdiction of Deogarh Forest Division for the purpose of Compensatory Afforestation in lieu of diversion of 87.520 Ha of forest land for Construction of Hidsing Irrigation Project & Canal System & Alternate Road. The Land Schedule of Compensatory Afforestation has been Identified by the Tahasildar Pallahara is as under given below,


Executive Engineer
Cutlax Investigation Division
CUTTACK-7

S.No	Name of the Village	Khata No	Plot No	Kissam	Area (Ha)	Area Suitable for ANR Plantation (Ha)	Remarks
1	Tanugola	48	676	Patita	2.104	2.104	Patch-I
2			677	Patita	2.015	2.015	
3			672	Patita	0.838	0.838	
4			671	Patita	2.125	2.125	
5			669	Patita	1.311	1.311	
6			668	Patita	0.931	0.931	
7			667	Patita	0.886	0.886	
8	Kadambinipur	32	107	Parabat-2	13.921	13.921	Patch-II
9			161	Parabat-2	6.597	6.597	
10			232	Parabat-2	16.592	16.592	
11	Baradiha	30	379	Parabat-3	10.069	10.069	Patch-III
12			380	Parabat-3	13.905	13.905	Patch-IV
13			6	Parabat-3	16.803	16.803	
14			93	Parabat-3	6.119	6.119	Patch-V
Total Area (Ha)					94.216	94.216	

The Compensatory Afforestation Scheme will be prepared by the Divisional Forest Officer Deogarh Forest Division as per the approved cost-norm. The Compensatory Afforestation cost will be borne by the user agency and undertaking is enclosed as **Annexure - 7**.

DGPS Map of Forest land proposed for diversion:-

Ministry of Environment and Forests, Government of India in their letter F.No.11-9/98-FC, dated 8.7.2011 have issued guidelines that all applications seeking prior approval of the Central Government under Forest (Conservation) Act, 1980 for diversion of forest land for non-forest purpose must be accompanied with Geo-referenced boundary in shape file pertaining to forest land proposed for diversion. These documents/Maps are required to ensure accurate delineation of the forest area to be diverted. The user agency in compliance to this order, has submitted the required digital maps duly by verified ORSAC and authenticated by Divisional Forest Officer, Angul Forest Division is enclosed as **PLATE No-III & IV**.


Executive Engineer
Cuttack Investigation Division
CUTTACK-7

Compliance of Govt. of India, MoEF & CC circular dated 3.8.2009/5.7.2013 on processing of the Forest Diversion Proposal as per provisions of the ST & other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006

In compliance to Govt. of India, MoEF & CC circulars vide F.No.11-9/1998-FC (Pt.) dated 3.8.2009 and subsequent guidelines issued thereafter in matter of ensuring compliance to the provisions of the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 while processing a Forest Diversion Proposal, the Collector, Angul has furnished in prescribed format an area of (55.940 Ac + 159.290 Ac) or 87.102 Ha allotted is enclosed as (Annexure-8 & 9).

Details of Certificates/Documents enclosed as required under the instructions.

Date:-

Place:-

Executive Engineer

Cuttack-Jobra Investigation Division

Cuttack-Odisha

Divisional Forest Officer

Angul Forest Division

Angul


Executive Engineer
Cuttack Investigation Division
CUTTACK-7


Divisional Forest Officer
Angul, Division