

Cost Benefit Analysis for the land proposed for diversion (365.66 Ha)

Land is required for development of the proposed Standalone Pumped Storage Component of Pinnapuram IREP. The proposed project contains project components like Reservoir, Powerhouse, Muck dumping, Construction camps and Colony etc. The total required land for the proposed project is 713.55 Ha Out of total land involved in the project, 365.66 Ha of forest land is to be diverted for non-forest purposes from Ghani Reserve Forest under Kurnool Division, Andhra Pradesh. As per the FCA guidelines, Cost Benefit Analysis has to be prepared for project feasibility and calculation of the same is furnished below.

Details of calculation of Cost - Benefit analysis:

S.No	Description	Details
1	Project	Standalone Pumped Storage Component of Pinnapuram IREP
2	Forest Land required (Ha)	365.66
3	Average site Quality of Forest	mixed Forest

BREAK UP OF FOREST LAND REQUIRED FOR THE PROJECT

Sl. No.	Components	Forest Land Area (Ha)
1	Intake Structure	8.02
2	Penstock	6.96
3	Power House & TRC Outlet	22.50
4	Tail Race Channel	2.43
5	Lower Reservoir	319.02
6	Proposed roads i. From Power House to Lower Reservoir ii. Lower Reservoir to Power House	6.73
	TOTAL	365.66



Table-A: Category of proposals for which Cost Benefit Analysis are applicable

Sr. No.	Nature of Proposal	Applicable / Not applicable	Remarks
01	All categories of proposals involving forest land up to 20 hectares in plains and up to 5 hectares in hills	Not Applicable	NIL
02	Proposal for defence installation purposes and oil prospecting (prospecting only)	Not Applicable	NIL
03	Habitation, establishment of industrial units, tourist lodges / complex and other building constructions.	Not Applicable	NIL
04	All other proposals involving forest land more than 20 Ha in plain and more than 5 ha in hills including roads, transmission lines, minor medium and major irrigation projects, hydel projects, mining activities, Railway lines, location specific installation like Micro-wave station, auto repeater center, TV towers, etc.	Applicable	These are cases where a Cost benefit analysis is necessary to determine when diverting the forest land to non-forest use is in the overall public interest.

Table B: Estimation of Cost of Forest Diversion:

SNo	Parameters	Cost in Rs. Lakhs	Remarks
1	Ecosystem services losses due to proposed forest diversion.	2289.03	Economic value of loss of eco-system services due to diversion of forests shall be the net present value (NPV) of the forest land being diverted (365.66 Ha) as prescribed by the Central Government (MoEF & CC). * NPV is considered as 6.26 L/Ha
2	Loss of animal husbandry productivity including loss of fodder.	228.90	Maximum of: (a) Estimated Quantity of fodder / grasses in M.T = Average production fodder per grasses in M.T per Ha x Area Applied diversion. based on the assumption that on closer an area can yield an average 2 to 4 MT of grass per ha. i.e 3 x 365.66 = 1096.98 MT. (Average fodder is 3 MT/Ha is considered) (b) Value or loss of fodder (Rs) = Estimated quantity x Market price = 1096.98 MT x Rs.5000/MT= Rs.54.895 Lakhs)

			2. Considered 10% NPV which is maximum : Rs 2289.03 Lakhs x 0.1 (10%) = Rs. 228.90 Lakhs
3	Cost of human resettlement.	Nil	
4	Loss of public facilities and administrative infrastructure (Roads, building, schools, dispensaries, electric lines, railways etc) on forest land, which would require forest land if these facilities were diverted due to the project.	202.5	i. About 1.6 Km of Road passing through lower reservoir is to be rerouted ii. 4.2 Ha of forest land is required for re-alignment of the road (new length of road would be -2.7 Km) iii. Laying of new road = 75 L/Km i.e 2.7*75 = 202.5 Lakhs
5	Possession value of forest land diverted.	1084.18	i. 30% of environmental costs (NPV) due to loss of forests (2289.03 x 0.30 = Rs 686.71 lakhs) ii. Circle rate of adjoining area is Rs. 1084.18 Lakhs which is maximum compared to 30% of NPV. Hence Rs 1084.18 Lakhs is considered as possession value of forest land diverted.
6	Cost of suffering to Oustees.	Nil	Not applicable, there is no Displacement of people.
7	Habitat Fragmentation Cost.	1144.52	The cost due to fragmentation has been pegged at 50% of NPV applicable as thumb rule...i.e.. 2289.03 x 0.50 = Rs. 1144.52 Lakhs
8	Compensatory afforestation and soil & moisture conservation cost.	6945.28	Total area for compensatory afforestation (365.66 Ha) @ 8 L/Ha = 2925.28 L Cost of Land (Non-Forest Land) = 402 ha @10.00/ha = 4020 Lakhs
	Total	11894.41	



Table C: Estimation of Benefits of Forest Diversion:

SNo	Parameters	Remarks	Benefits (in lakhs)
01	Increase in productivity attribute to the proposed project	The 1200 MW Standalone Pumped Storage Component of Pinnapuram IRE Project would contribute planned peak power generation, there would be direct revenue to the State and the Nation. Further, the overall improvement of the infrastructure like Roads, Industries, Eco-tourism, Communication etc. would boost up the economy of the State and improve the standard of living of people. The project is proposed to generate Revenue of 960 Cr/Year	96000
02	Benefits to economy due to the Project	Power/energy is one of the prime requirements for the overall development of a State and Nation. Since, IREP power is the cleanest, cheapest and environmentally friendly source of energy; development of project will facilitate the emergence of industries, trade and commerce and would thereby bring more and more economic development in the State & Country. The establishment of more industries and production units due to improved power supply in the State will directly boost the overall economy of the State & the country at large.	
03	No. of population Benefited due to the Project	Direct Employment during Construction-2000, Operation-600 The completion of project will directly and indirectly benefit the population residing in Kurnool District as well as State and the Country.	
04	Economic benefits due to direct & indirect employment due to the Project	Benefits due to direct employment, during the construction phase, employment will be generated for skilled and unskilled manpower. Approximately 2000 persons will be employed during the peak time of construction. The local people will also get the opportunity to carry out contract works subject to their work capability / expertise. After completion of the Project, during operation of the project about 600 people will be employed for routine operation and maintenance of roads and other structures.	
05	Economic benefits due to Compensatory Afforestation	Benefits from Compensatory Afforestation (CA) accruing over next 50 years and discounted to Present Value.	
		Total Benefits	96000

* Cost of the Economic benefits due to direct & indirect employment is not considered

Table D. Calculation of Cost Benefit Ratio:

Total Benefits (As per Table C: Estimation of benefits of Forest Diversion) = Rs.96000 Lakhs

Total Cost (As per Table B: losses of forests) = Rs. 11894.41 Lakhs

Hence, Benefit/ Cost Ratio = 8.07

Thus, the project gives positive Benefit/ Cost Ratio. The monetary returns of the Project are positive over the environmental losses.

