

COST BENEFIT ANALYSIS

[Ref: MoEF guideline No. FNO.5-3/2011-FC(Vol-I)]

Total forest area: 43.671 ha

PROJECT: CONSTRUCTION OF 132 KV DC ITKHORI - CHATRA

Table -A: - Case under which a cost - benefit analysis for forest diversion are required

No.	Nature of Proposal	Applicable/ applicable	NOT	Remarks
1	All Categories of proposal involving Forest land up to 20 hectares in plain and up to 5 hectares in hills	Not Applicable		
2	Proposal for defence installation purpose and oil prospecting (prospecting only)	Not Applicable		
3	Habitation, establishment of industrial units, tourist lodge complex and other building construction.	Not Applicable		
4	All other proposals involving forest land more than 20 hectare in plains and more than 5 hectares in hills including roads, Transmission line, minor, medium and major irrigation project, hydro project, mining captivity, railway lines, location specific installation like micro wave station, auto repeater centre, TV tower etc.	Applicable		There are cases where a cost benefit analysis is necessary to determined when diverging the forest land to non-forest land user in the overall public interest.

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Table- B:-Estimation of cost of forest diversion

SN	Parameters	Remarks	Monetary Equivalent
1	Ecosystem service losses due to proposal forest diversion	Economic value of loss of ecosystem service due to diversion of forest shall be the net present value (NVP) of the forest being diverted as prescribed by the Central Government (MoEF& CC.) Note: In case of National parks the NVP shall be ten (10) times the normal NVP or otherwise prescribe NVP by the ministry or any other competent authority	Considering the Net present value of forest area to be diverted be 12.2859 Lakh per ha as per dense forest in Eco class III Hence losses to Eco system Rupees: 43.671 ha X 12.28 lakh)=Rs.536.5375 lakh
2	Loss of animal husbandry productivity, including loss of fodder	To be quantified and expressed in monetary terms or 10% of NVP applicable whichever is maximum	53.6537 Lakh
3	Cost of human resettlement	To be quantified and expressed in monetary terms as per approved R& R plan	Nil
4	Loss of public facilities and administrative infrastructure (Road, Building, School, dispensaries, electric lines railways, etc.) on forest land, which would require forest land if these facilities were diverted due to the project	To be quantified and expressed in monetary terms on actual cost basis at the time of diversion	Nil
5	Possession value of forest land diverted	30% of environmental cost (NVP) due to loss of forests or circle rate of adjoining area in the district should be added as a cost component as possession value of forest land whichever maximum	The possession value of forest land diverted is calculated as Rs. 160.9612 lakh. (30% of NVP) However, in case of Transmission line project possession of diverted forest land is not complete required by the user Agency after completion of the project & during operation and maintenance (O & M) stage


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			As per existing MoEF guideline. Dwarf species plantation will be undertaking below the Transmission line corridor (RoW) By forest department. Only looping & pruning of tree branches near the electric conductor will be required during the maintenance period of the project.
6	Cost of suffering to ousters	The social cost of rehabilitation of ousters (in addition to the cost likely to be incurred in providing residence, occupation and social services as per R&R plan) be worked out as 1.5 times of what ousters should have earned in two years had he not been shifted.	Not applicable for this project since there is no resettlement involved.
7	Habitat Fragmentation cost	While the relationship fragmentation and forest goods and services is complex for the sake of simplicity the cost due to fragmentation has been pegged at 50% of NVP applicable as a thumb rule.	50 % of NPV: 12.2859 lakh X 43.671 ha X 50%= 268.2687 lakh
8	Compensatory afforestation and soil and moisture conservation cost	The actual cost of compensatory afforestation and soil moisture conservation and its maintenance in future at present discounted value	Cost of CA considered as 4 lakh per ha including soil & moisture conservation work. Total CA Cost = 43.671 ha *4=174.684 Lakh
9	Project Cost	Fixed assets, inclusive of investment, Current assets Loans & advances Other Expenditures like preoperative expenses, interests during construction etc.	Rs. 235.239 Lakh
	Total		(536.5375+53.6537+160.9612 +268.2687+174.684+235.239) = Rs. 1429.3441 Lakh


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Table -C-Existing guideline for estimation benefit of forest-diversion in CBA

Sr No.	Parameters	Remarks	Monetary equivalent
1	Increase productivity attribution to the specific project	To be quantified & expressed in monetary terms avoiding double counting	The monetary returns of the specific Transmission project is calculate as below: Power Flow: 80 MW Average value added: Rs. 0.31 per kwh Energy send out per year: $80 \times 1000 \times 8760 = 700.8 \times 10^6 \text{ kwh}$ Value added: $700.8 \times 10^6 \times 0.31 = 21.72 \text{ Crore/year} = 22 \text{ Crore/year}$ Value added for 50 years: $22 \times 50 = 1100 \text{ Crore} = 110000 \text{ Lakh}$
2	Benefits to economy due to the specific project	The incremental economic benefit in monetary terms due to the specific project	Uninterrupted supply of electricity can make a big difference in society. It boosts socio economic growth, irrigation, telecommunication facilities, health, education and overall economy of state. The lum sum monetary equivalent of above benefits considered as 100 lakh.
3	No. of population benefited due to specific project	As per the Detailed project report	Population of whole Chatra district will benefitted by this project. This will help to provide stable power supply of govt. office Like D.C. Office, DFO Office, Block, Thana, and other govt. buildings and household of different villages. It helps greatly to improve socio economy development of the area. The Lump Sum Monetary equivalent of the benefit is considered as: Rs.50.0 Lakh
4	Economic benefits due to direct and indirect employe	As per the Detail project report	A. Minimum 150 temporary labour engaged during the construction of transmission line for approx 300 days. Mendays(approx.)= $150 \times 300 \times 300 = 135 \text{ Lakh}$

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	nt due to the project		B. Permanent Employee =06 for entire period. Therefore 06*60000*12*25year =Rs.1080.00 Lakh
5	Economic benefits due to Compensatory afforestation	Economic Benefit Due to Compensatory Afforestation (The NPV of the CA land Considered as Prescribed by the Guidelines 5-3/2011-FC (Vol-1) Dtd.06.01.2022 NPV rates taken as Class III medium Density Forest Rs-12.2859 lacks/Ha. for 87.342 Ha (Cost For Double of 43.671 Ha.)	Benefit from such compensatory forestation is huge and monetary equivalent is equals Rs. 1073.075 Lakh
Total benefits of the project (monetary equivalent)			(110000+100+50+135+1080+1073) = Rs. 112438 Lakh

Cost benefit ratio:-

Table B: Total estimated cost of forest diversion = Rs. 1429.3441 Lakh

Table C: Total benefit to society = Rs. 112438 Lakh

Cost Benefit Ratio(CBA Ratio) = 1:78.66

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