COST BENEFIT ANALYSIS

(Ref: MoEF guideline No. 7-69/2011-FC (Pt) dtd-01 AUG 2017)

Name of Project : Widening/Strengthening & Reconstruction of Barlanga - Nemra-Pirgul-Kasmar (Bahadurpur (on NH-23)-Kasmar-Kherachater upto West Bengal border) road(Length-27.608 KM) into 2-lane with Paved shoulder, Ramgarh & Bokaro District in the state of Jharkhand.

Purpose : Proposed for diversion of 16.2931 Hec. Forest Land under Bokaro Forest Division. Under FCA 1980, Within the Proposed ROW of Proposed Barlanga to Kasmar Via Nemra Road.

Table- A : Cases under which a cost-benefits analysis for forest diversion are required.

Sl. No.	Nature of Proposal	Applicable/Not Applicable	Remarks
1	All categories of proposals involving forest land up to 20 hectares in plains and up to 5 hectares in hills.	Not applicable	
2	Proposal for defense installation purposes and oil prospecting (prospecting only)	Not applicable	
3	Habitation establishment of industrial unites, tourist lodges complex and other building construction	Not applicable	
4	All other proposals involving forest land more than 20 hectares in plains and more than 5 hectares in hills, including roads, transmission lines, minor, medium and major irrigation projects, hydro projects, mining activity, railway lines, location specific installation like micro-wave stations, auto repeater centers, TV towers 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.

Table- B : Estimation of cost of forest diversion

Sl	Parameters	Remarks	Monetary Equivalent
1	Ecosystem services losses due to proposed forest diversion.	Economic value of loss of ecosystem service due to forest diversion of forest shall be the net-present value (NVP) of the forest land 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 and in case of wildlife Sanctuary the NPV shall be five (5) times of normal NPV or otherwise prescribed by the ministry or any other competent authority	The NPV value as per Forest Conservation Act 1980 is **12.2859** Lakhs per Hectare. Hence the total loss of timber, fuel wood and minor forest produce for **16.2931** hectare of forest may be calculated **16.2931 x12.2859= Rs 200.18 lakhs**. Eco-Density is Moderately Dense Forest. Tree Canopy Density is b/w 0.4 to 0.7. Eco-Class is III.
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	10% of NPV=10% of **200.18 =20.018** Lakhs
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 (Roads, building, schools, dispensaries, electric lines, railway etc.) on forest land. Which would require forest land if these facilities were diverted due to the	To be quantified and expressed in monetary terms on actual cost basis at the time of diversion	NIL

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	project.		
5	Possession value of forest land diverted	30% of environment costs (NPV) 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 is maximum	Possession value of forest will be **@30% of NPV = 0.3 x 200.18= Rs 60.054 lakh**
6	Cost of suffering to outees	The social cost of rehabilitation of outees (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 oustees should have earned in two years had he not been shifted	Nil
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% NVP applicable as a thumb rule	Habitat fragmentation Cost is @ **50% of NPV = 0.5x200.18= Rs 100.09 lakh**
8	Compensatory afforestation,Pillaring,Post HPC Recommedation Plantation,Wild life Management plan,Wild Life Corridor and soil & moisture conservation cost.	The actual cost of compensatory afforestation and soil moisture conservation and its maintenances in future at present discounted value.	Diversion of land involved = 16.2931 Hectare Compensatory afforestation will be done in double of 16.2931 Hecatare = 32.5862 Hectare, Value of afforestation **@3,83,598 Per Hectare = 125 Lakh** Cost For Soil & moisture conservation = **150 lakhs** Cost For the Construction of Under passes :- **3x550 Lakh= 1650 lakh** Cost For the Construction of pillar **:- 12.5 Lakh** Cost For the Post HPC Recommendation Plantation :- **387.50 Lakh.** Cost For the Preparation of Wildlife Management Plan :- **350 Lakh**

Total Estimated Cost as per Table B = Rs 200.18+ 20.018 +60.054 + 100.09 +125+150+1650+12.5+ 387.50+350 = Rs3055.342 Lakh

Table – C – Estimating benefits of forest-diversion in CBA

Sl. No.	Parameters	Remarks	Monetary Equivalent
1	Increase in Productivity attribute to the specific project	To be quantified & expressed in monetary terms avoiding double counting	Construction of 2 laning of Ramgarh & Bokaro under Barlanga to Kasmar via Nemra Road can make a big difference in society it boosts socio economic growth, Business, Industry health, education and overall ecomomy of state. The lump sum monetary equilvalent of above benefits considered as 100 Lakh
2	Benefits to economy due to the specific project	The incremental economic benefit in monetary terms due the activities attributed to the speciiic project	It estimated that through passenger, carriage of goods & other means this project would give minimum 200 lakh rupees to state economy per Year.
3	No. of Population benefited due to specific project	As per the Detailed project report	Population of whole Jharkhand and some other states will benefitted by this project. It helps greatly to improve socio economy development of the area. The Lump Sum

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			Monetary equivalent of the benefit is considered as Rs 50 Lakh.
4	Economic benefits due to of direct and Indirect employment due to the project	As per the Detail project report	A. Minimum 300 temporary labour engaged during the construction of road for approx 300 days per year for 2 year @ Rs 486.64 per day = 300x300x2x486.64= 875.95 lakh B. Indirect employee (in 2nos rest area) = LS 5nos for entire period.Therefore 10x15000x12x99 year = Rs 1782 Lakh C. Permanent Employee = (5 nos. for 5 years) = 10x5x12x20000 = Rs 120 Lakh Total economic Benefit = 875.95+1782+120 =Rs.2777.95 Lakh
5	Economic Benefits due to Compensatory afforestation	Benefits from such compensatory forestation accruing over next 50 years monetized and discounted to the present value should be included as benefits of compensatory. Afforestation * For benefits of CA the guideline of the ministry for NVP estimation may be consulted.	Considering the NPV of 12.2859 Lakhs per hectare the total benefit of timber, fuel wood and minor forest produce for 32.5862 hectare of forest may be calculated as 32.5862x12.2859 = 400.3508 lakh

Total benefit as per Table C = Rs. 100+200+50+2777.95+400.3508 = Rs 3528.30 lakhs

Total environment loss = Rs 3055.342 Lakh

Total benefit to society = Rs 3528.30 lakh

Hence Cost Benefit Ratio = 3055.342 : 3528.30

= 1 : 1.155

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