

**COST BENEFIT ANALYSIS**

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

**Name of Project:** *Diversion of fresh Forest Land for development of Economic Corridors, Inter Corridors, Feeder Routes etc., under Bharatmala Pariyojana of Jaina More -Gola -Ormanjhi section in the state of Jharkhand.*

**Purpose:** Proposal for diversion of **99.7862 Ha** Forest Land under Bokaro, Ramgarh & Ranchi Forest Division, under FCA 1980, within the proposed ROW of Proposed Jaina More -Gola -Ormanjhi Road section.

**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 hectare 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 installations 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**

SI	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 (NPV) 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 NPV 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.	Only one time loss of vegetation occurs during construction and there no loss of man-hours. Considering the NPV value as per Forest Conservation Act 1980 is 8.04 Lakhs per Hectare. Hence, the total loss of timber, fuel wood and minor forest produce for 91.8225 hectare of forest may be calculated $99.7862 \times 8.04 =$ Rs.802.28 Lakhs.
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 802.28 =80.23 Lakhs.
3	Cost of human resettlement.	To be quantified and expressed In monetary terms as per approved R&R Plan.	NIL. Human resettlement is not required since no family residing in forest land.
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 project.	To be quantified and expressed In monetary terms on actual cost basis at the time of diversion.	Nil

**Cost Benefit Analysis**

5	Possession value of forest land diverted.	30% of environmental 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 lands whichever is maximum.	Possession value of forest land will be @30% of NPV= $0.3 \times 802.28 = \text{Rs } 240.68 \text{ lakh}$ .
6	Cost of suffering to oustees.	The social cost of rehabilitation of oustees (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% of NVP applicable as a thumb rule.	Habitat Fragmentation Cost is @ 50% of NPV= $0.50 \times 802.28 = \text{Rs } 401.14 \text{ lakh}$
8	Compensatory afforestation and soil & moisture conservation cost.	The actual cost of compensatory afforestation and soil moisture conservation and its maintenance in future at present discounted value.	Diversion of land involved =99.7862 Hectare Compensatory afforestation will be done in double of 99.7862 Hectare=199.5724 Hectare, Value of afforestation @2,00,000 per Hectare =399.14 Lakh.

**Total Estimated Cost as per Table B = Rs. 802.28 + 80.23 + 240.68 + 401.14 + 399.14 = Rs.1923.47 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 4 laning of Bokaro (Jaina More) – Gola – Ormanjhi Road can make a big difference in society. It boosts socio economic growth, Business, industry health, education and overall economy of state. The lump sum monetary equivalent of above benefits considered as 200 lakh.
2	Benefits to economy due to the specific project.	The incremental economic benefit in monetary terms due the activities attributed to the specific project.	It estimated that through passenger, carriage of goods & other means this project would give minimum 100 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 be benefitted by this project. It helps greatly to improve socio economy development of the area. The Lump Sum Monetary equivalent of the benefit is considered as: Rs.100 lakh.
4	Economic benefits due to of direct and indirect employment due to the project.	As per the Detail project report.	<p>A. Minimum 200 temporary labour engaged during the construction of road for aprox 300 days per year for 3 year@ Rs. 450 per day. =<math>200 \times 300 \times 3 \times 450 = 810 \text{ lakh}</math>.</p> <p>B. Indirect employee (in 2nos rest area)= LS 50 nos for entire period. Therefore <math>50 \times 15000 \times 12 \times 99 \text{ year} = \text{Rs. } 8910 \text{ lakh}</math></p> <p>C. Permanent Employee= (15 nos for 25years) =<math>15 \times 25 \times 12 \times 20000 = \text{Rs. } 900 \text{ lakh}</math>.</p> <p><b>Total economic Benefit =810+8910+900 = Rs.10620 lakh.</b></p>

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 8.04 lakhs per hectare, the total benefit of timber, fuel wood and minor forest produce for 183.645 hectare of forest may be calculated as $199.5724 \times 8.04 = 1604.56$ lakhs
---	---	--	--

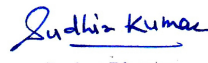
**Total benefit as per Table C = Rs. 200+100+100+10620+1604.56 =Rs.12624.56 lakhs**

**Total environmental loss = Rs. 1923.47 lakh**

**Total benefit to society= Rs. 12624.56 lakh.**

**Hence Cost Benefit Ratio = 1923.47: 12624.56**

**= 1 : 6.56**

  
Project Director  
NHAI, PIU  
Dhanbad