

## **COST-BENEFITS ANALYSIS FOR DIVERSION OF FOREST LAND**

**Name of Proposal:-** Diversion of Forest land for Rehabilitation and Upgradation of single / Intermediate Lane to Two lane from km 75.00 to 101.00 on NH-123(507) under EPC mode in the State of Uttarakhand.

**Nature of Proposal:-** Diversion of 31.860ha. of Open forest land of Upper Yamuna Forest Division under FCA, 1980, Rehabilitation and Upgradation of single / Intermediate Lane to Two lane from Chainage km 75.00 to 101.00 on NH-507 under EPC mode in the State of Uttarakhand.

**Total Length of the project road in/along the forest area:-**17.700km

**Total No. of District which proposed road alignment transverse:-**1

**Forest area proposed for diversion:-**31.860 Ha.

**Purpose:-**The cost benefit analysis is being undertaken for proposed diversion of forest land for widening of existing road for the above project. Cost Benefit Analysis as per MoEF&CC guideline for Forest Land Diversion – August 2017 and 6 January 2022.

Since the proposal is for diversion of forest area measuring more than 5 hectare in hills for road project, cost benefit analysis report is applicable.

**Table -A: Estimation cost of forest diversion**

S.No.	Parameters	Reference Guideline	Evaluation
1	Ecosystem Services losses due to proposed forest diversion	As per MoEFF&CC notification for NPV. Note: The Net Present Value (NPV) of forest land diverted is scientific method of calculating the environmental cost and other losses caused due to diversion of forest land for non-forestry purposes. The NPV represents the net values of various ecosystem services and other environmental services in monetary terms which forest would have provided if forest land not diverted.	Forest land proposed for diversion falls under Eco-class -V (Dense Forest). Since the Dense forest land is of Eco Class -V having density 0.5, therefore per hectare NPV rate as per MOEF&CC circular No. 5-3/2011-FC (Vol-I) dated 6th Jan 2022 is taken Rs. 1292850 per Ha. So NPV for forest area: $31.860 \times 1292850 = 411.90 \text{ Lakhs}$
	Loss of animal husbandry productivity, including loss of fodder	To be quantified and expressed in monetary terms or 10% of NPV applicable whichever is maximum.	Loss of animal husbandry due to proposed diversion is very moderate as calculated Gross loss@ 5 ton/ha./yr. : $(31.860 \times 5 \times 100) \times 50 \text{ yrs.} = 7.96 \text{ Lakhs}$ 10% of NPV= <b>41.19 Lakhs (Maximum one)</b>
2	Cost of Human Settlement	To be quantified & expressed in monetary terms on actual terms as per approved R&R plan	Nil, as no human resettlement required
3	Loss of public facilities and administrative infrastructure (Roads, building, schools,	To be quantified & expressed in monetary terms on actual terms at the time of diversion	No loss of public infrastructure like roads, building etc. are envisaged from proposed ROW

S.No.	Parameters	Reference Guideline	Evaluation
	electric line, water line etc.) on forest land which require forest land if these facilities were diverted due to the project.		located in forest land area. No cost of utility shifting in the proposed forest land for diversion.
4	Possession value of forest land diverted	30% of environmental cost (NPV) or circle rate of area in the district should be added as a cost component as possession value of forest lands whichever is maximum.	30% of environmental cost (NPV)= Rs 123.57 Lakhs. Average per Ha. land (non-commercial) rate along project road in nearby village to forest land to be diverted rate Rs. 3100 / sq.mtr Cost @31.86*10000*3100= Rs 9876.60 Lakhs (Maximum one)
5	Cost of suffering to oustees	The social cost of rehabilitation oustees in addition to cost likely to be incurred in providing residence, occupation etc. as per R&R, to be worked out as 1.5 times of what oustees should have earned in two years if not been shifted.	Nil, no Resettlement & Rehabilitation is required in Forest land proposed for diversion. no losses on this account.
6	Habitat fragmentation	Wildlife habitat fragmentation and forest services is complex, so simply taken 50% of NPV cost	50% of environmental cost (NPV)= 205.95 Lakhs
7	EcoRestorationCompensatory afforestation and soil & moisture conservation cost	Actual cost of compensatory afforestation and soil & moisture conservation	EcoRestoration and Compensatory afforestation and Soil & moisture conservation Cost @5.0 Lakhs per hectare = 31.86 x 2 x 5.0 = 318.60 Lakhs

**Table -B: Estimation benefits of forest diversion in cost benefit analysis (CBA)**

S.No.	Parameters	Reference Guideline	Evaluation
1	Increase in productivity due to project road	To be quantified & expressed in monetary terms.	Proposed forest diversion is for widening of existing road and project road will improve accessibility to the region leading to economic and social development in the region. Further saving in terms of travel time, fuel saving and growth rate increase of the state due to tourist increase etc. All these are considered in Economic benefits of project road.
2	Benefits to economy due to specific project	The incremental economic benefits in monetary terms due to the activities due to project road	Economic Improvement in the Project district considering 0.05% enhanced growth rate in the GDP against normal benefit for next 5 yers. There are 13 districts in Uttarakhand. (Current GDP of the state @ Rs 3,94675.00 Crore / annum) $(3,94,675 \times 100 \times 0.05 \times 5 / 100 / 13) = 7589.90 \text{ Lakhs}$
3	No. of population benefited from the project	As per the project report and census data	The proposed road project in the Uttarakhand state is part of NH-507 in the district Uttarkashi. Whole population of Uttarakhand state (100.86 lakhs)



S.No.	Parameters	Reference Guideline	Evaluation
			will be benefit from the project, specifically Uttarkashi population projected 5.0 Lakh for 2025.
4	Economic benefits due to employment generation	As per the project report	Construction stage employment considering 2 years construction period for project generating 1123200 Mandays (1800 no. of peoples*26 days in month*24 months) employment @600 Rs. Per day = <b>6739.20 Lakhs</b>
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 NPV estimation may be consulted	In lieu of total trees to be cut for the proposed road in the forest area, it is proposed to undertake compensatory plantation as per forest conservation act. equal to double of the diverted forest area, it will increase productivity.  Ecological value of compensatory afforestation @15 lakhs for density 1 forest as per Forest conservation act, 1980  Benefits from compensatory forestation accruing over next 50 years is huge and monetary equivalent is considered @ present NPV.  @ $(31.860 \times 2) \times 1005210 = 640.52 \text{ Lakh}$


**Table C: Cost Benefit Analysis for the Project**

S.No.	Total cost/Loss (in Lakhs)	Benefits (in Lakhs)
1	Ecosystem Services losses <b>Rs. 411.90 Lakh</b>	Benefits to economy due to specific project. <b>Rs. 7589.90 Lakh</b>
2	Loss of animal husbandry productivity, including loss of fodder <b>Rs. 41.19 Lakh</b>	Economic benefits due to employment generation. <b>Rs. 6739.20 Lakh</b>
3	Possession value of Forest land Diverted <b>Rs. 9876.60 Lakh</b>	Ecological Gain from compensatory afforestation. <b>Rs. 640.52 Lakh</b>
4	Habitat Fragmentation <b>Rs. 160.13 Lakh</b>	
5	Eco Restoration and Compensatory afforestation and Soil & moisture conservation <b>Cost Rs. 318.60 Lakh</b>	
<b>Total</b>	<b>411.90 + 41.19 + 9876.60 + 205.95 + 318.60 = 10854.24 Lakhs</b>	<b>7589.90 + 6739.20 + 640.52 = 14969.62 Lakh</b>
<b>Cost-Benefit Ratio (Total benefit/Total cost)</b>		<b>14969.62/10854.24 = 1.38</b>

Cost-Benefit Ratio is (>1) high as lesser forest area to be diverted compare to length of project road alignment benefitting the project district and state economy.

  
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