

**COST BENEFITS ANALYSIS IN ACCORDANCE WITH GOI FC GUIDLINES NO 7-69/2011-FC DATED 01-08-2017'**

**Project Name:** - Improvement and Up-gradation of Moradabad - Kashipur section of NH-734 including Moradabad bypass under NHDP pahse-VII in the state of Uttar Pradesh. Package-II: Moradabad - Kashipur Road (Length= 39.750 km) Start from Ch. 0+00 (Existing Km. 389+000) at Bijna and ends at Ch. 39+750 at UP/UK Border near Dhandi River.

**Nature of Proposal:** Diversion of 63.5796 ha. of Protected Forest in Moradabad Forest division.

**Total Length of Project Road Section:** 39+750 Km.

**Length of the project road along the Protected Forest:** 39+750 km. in Moradabad Kashipur Road Upto UP Border

**Total Forest Area Proposed for Diversion:** Total Forest area in both districts is **63.5796** ha.

**Purpose:** The Cost Benefit Analysis is being undertaken as the proposed diversion of forest land being affected *due* to widening (Two Lanning) of existing road for above said project is >20 Ha.

**NOTE-** NPV cost will be provided by the concern DFO office, however, to calculate the Cost Benefit Analysis we have assumed the forest as Eco class – IV (OF) and accordingly density 0.4.

The NPV cost/ha. will be Rs. 4,38,000/-, therefore District wise NPV calculation value is given below-

Sr.No.	District Name	Area (ha.)	Density	Rate/Ha.	Amount (Rs.)
1.	Moradabad	63.5796	0.4	4,38,000	27,847,865
<b>TOTAL AREA &amp; NPV VALUE</b>		<b>63.5796</b>			<b>27,847,865/-</b>

**Cost Benefit Analysis as per Guidelines for Forest Land Diversion-2017**

Sr. No	Nature of Project	Applicable/Not Applicable	Remarks
1	All categories of proposal involving forest land upto 20 ha. In plains and upto 5 Ha. In hills	Not Applicable	These proposals may be considered on a case-to-case basis and value judgements.
2	Proposal for defense installation purpose and oil prospecting (prospecting only)	Not Applicable	In view of national priority accorded to these sectors, the proposals would be critically



Sr. No	Nature of Project	Applicable/Not Applicable	Remarks
			that the utmost minimum forest land is diverted for non-forest use.
3	Habitation, establishment of industrial units, tourist lodge complex and other building construction.	Not Applicable	These activities being determine to protection and conservation of proposal would be rarely entertained
4	All other proposals involving forest land more than 20 Ha. In plains and more than 5 Ha. In hills including roads, Transmission line, minor, medium and major irrigation projects, hydro projects, mining activity, railway line, location specific installations like	Applicable	These are cases where a cost-benefit analysis is necessary to determine when diverting the forest land to non-forest use in the overall public interest

Since the proposal is for diversion of forest land measuring more than 20 Ha. In the plain area for road project, cost benefit analysis report is applicable.

Table-B: Estimate of Cost of Forest Diversion Moradabad District

Sr. No.	Parameters	Given Guideline	Evaluation
1	Ecosystem  Services losses due to Proposed forest diversion	<p>Economic value of loss of ecosystem service due to diversion of forests shall be the net present value (NPV) of the forest land being diverted as prescribed by Central Government (MoEF&amp;CC)</p> <p>Note: - in case of National Parks the NPV shall be ten (10) times the normal NPV and in case Wildlife Sanctuary the NPV shall be five (5) times the normal NPV or otherwise prescribed by the ministry or any other competent authority.</p> <p>Note: -1: Net Present Value (NPV) of environment and ecosystem service loss: - The concept of Net Present Value (NPV) of environment and ecosystem services loss:- The Concept of Net Present Value of the forest land diverted is a scientific method of calculating the environment cost and other losses caused due to diversion of</p>	<p>NPV value as per of forest Conservation act 1980 is in between Rs. 5.8 and 9.2 lac per hectare.</p> <p>Accordingly, NPV value for proposeddiverted land is assumed for</p> <p>Moradabad forest Division is = Rs. 278.478 Lac.</p> <p>Total NPV for the Division is = Rs. 278.478 Lac.</p>



		Forest land for non-Forestry purpose, the NPV represents the net value of various ecosystem services and other environment services in monetary terms which if the Forest would not have been diverted.	
2.	Loss of animal husbandry, productivity including loss of fodder	To be quantified and expressed in monetary terms of 10% of NPV applicable whichever is maximum.	<p>Loss of Animal husbandry due to proposed diversion is very moderate and calculated below.</p> <p>Gross Loss @ 5 ton/Ha/year @ Rs. 100/- per tonne. Therefore, loss of fodder as estimated for about 63.5796 Ha. Will be 63.5796 X 5 X 100 = 31,790/Yr X 50 years = Rs. 1,589,490/- (15.89 Lac).</p> <p>Further considering 10% of NPV will be = 278.478 Lac X 0.1 = Rs. 27.8478 Lac.</p> <p>So, considered amount (maximum one) is Rs. 27.8478 Lac.</p>
3.	Cost of human resettlement	To be quantified and expressed in monetary terms on actual terms as per approved R&R plan.	Nil human Resettlement is required since no family residing in forest land.
4.	Loss of public facilities and administrative infrastructure (roads, buildings, schools, dispensaries, electric lines, railways etc) on forest land or 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 of the time of diversion.	<p>No Loss of public Infrastructure and administrative infrastructure (roads, buildings, schools, dispensaries, electric lines, railways, etc) on the forest land.</p> <p>All public utilities affected will be shifted by <b>NHAI, PIU Moradabad</b> at cost. of Rs 3234.00 Lakhs.</p>
5.	Possession value of forest land.	30% of environmental cost (NPV) due to loss of forest or circle rate of adjoining area in the district should be added as a cost component as possession value of forestland whichever is maximum.	<p>Possession value of forest land will be • (considering 30% of NPV) = 0.3 X 278.478 = 83.5434 Lac.</p> <p>Per hectare land rate along the highway in district Moradabad is approx. 50 lac/Ha. So, possession value</p>



		<p>Note 2: Possession value of forest land diverted:- The forest land diverted for the project such as irrigation, hydropower, railways, roads, wind and transmission lines and mining etc are unlikely to be returned and remains in the possession of the user agencies, Therefore 30% of the net present value (NPV) of forest land diverted or market rate of adjoining area in the district should be added as a cost component as "possession value of forest land" in addition to the environmental cost due to loss of forests.</p>	<p>of Moradabad district forest land (as per average circle rate) = 63.5796 ha. X 50 Lac = 3,178.98 lac and Per hectare land rate along the highway in district Moradabad.</p> <p>So Total possession value of forest land of the division (as per average circle rate) = Rs. 3,178.98 Lac.</p> <p>So, considered amount (Maximum one) is Rs. 3,178.98 Lac.</p>
6.	Cost of Suffering to ousters	<p>The social cost of rehabilitation of ousts (in additional to the cost likely to be incurred in providing residence, occupation and social services as per R&amp;R plan) be worked out as 1.5 times of what ousts should have earned in two years had he not shifted.</p>	<p>NIL, no resettlement &amp; rehabilitation is identified or required in forest land which is proposed to be diverted. Also, the community residing along the project road is not dependent on forest or forest produce.</p> <p>There will not be any losses on this account as diversion of the forest land to this project will not affect any house or structure in protected forest area which is basically a linear plantation.</p>
7.	Habitat Fragmentation Cost	<p>While the relationship between fragmentation and forest goods and services is complex, for the sake of simplicity the cost due to fragmentation has been pegged at 50% of NPV applicable as a thumb rule.</p>	<p>Habitat fragmentation cost is 50% of NPV that is Rs. 278.478 X 50% = Rs. 139.239 Lac.</p>
8.	Compensatory Afforestation and soil & moisture conservation cost	<p>The actual cost of compensatory afforestation and soil &amp; moisture conservation and its maintenance in future at present discounted value.</p>	<p>The rate is approximately same as those adopted in other stage-I approved projects of NHAI in the area i.e. approx. 3 Lakhs per hectare However the exact amount will be provided by concern DFO office.</p> <p>Considering 3 Lakhs per hectare for estimate the Cost of CA = 3X 63.5796= Rs. 190.7388Lakhs</p>

Table-C:- Existing guideline for estimating benefit of forest diversion in Cost Benefit Analysis (CBA)



Sr. No.	Parameters	Given Guideline	Evaluation
1	Increase in productivity attributable to the specific project	To be quantified & expressed in monetary terms avoiding double counting.	<p>Socio economic benefits due to the road project will provide the</p> <ul style="list-style-type: none"> <li>• connectivity to state capital to district head quarter</li> <li>• with high speed corridor leading to reduced travel time and fuel consumption.</li> <li>• The benefits to trade specially in moment of perishable goods.</li> <li>* Access to new industrial areas.</li> <li>• Overall enhancement of socio- economic condition of the area along the project corridor.</li> <li>• Though overall mission to increase the GDP of the said region and make it comparable/above the nation GDP Again, directly approximately 9000-man days of temporary and 50 permanent employment will be generated during the construction of the Project for a period of 2 years</li> </ul>
2	Benefits to economy due to specific project.	The incremental economic benefit in ' monetary terms due to the activities attributed to the specific project.	<p>Economic benefit in terms of increase in trade, saving in vehicular operation and maintenance cost better connectivity, safer journey to commuter and saving of travel time. Improved road connectivity helps in better implementation and management of government schemes. It will provide last and economical transport of goods.</p> <p>After completion of project, the local people and industries situated in the area will be greatly benefited. The</p>



			<p>widening of project road will provide safe, fast, economic and environmentally friendly transportation to the state which in term will accelerate the rate of growth in this area. In addition to that there are several other benefits that may accrue due to saving in fuel, reduction in time to commute, vehicle maintenance, reduction in carbon emission etc.</p> <p>"However, they have not been quantified as it will be a function of various govt. policy variables." Exact quantification of the value is not possible as it is time and policy dependent.</p>
3	No. of population benefited due To specific project/	As per detailed project report.	The Population of 47.7 lakhs People from district Moradabad will be benefited directly.
4	Economic benefit due to direct and indirect Employment Potential	As per detailed project report.	Approximately 9000-man days of temporary and 50 permanent employment will be generated during the construction of the Project for a period of 2 years
5	Economic benefit due to compensatory afforestation	Benefit from such compensatory afforestation accruing over next 50 years monetized and discounted to the present value should be included as benefit of CA the guideline of the Ministry for NMI estimation may be consulted.	<p>In Lieu of total forest land to be affected it is proposed to be undertake at least twice of the affected trees as Compensatory Afforestation as per Forest (Conservation) Act 1980.</p> <p>Apart from compensatory plantation and on road divider plantation. The compensatory afforestation will be taken up in about 63.5796 ha (Moradabad forest division) for diverted protected land, so Total compensatory afforestation will be taken <math>63.5796 \times 2 = 127.1592</math> ha. Degraded forest land which is two</p>



			<p>times of the area proposed to be diverted.</p> <p>The Compensatory Afforestation will be done in <b>127.1592</b> ha. Of degraded forest land, which is down the line would be having a density of minimum 0.4. The ecological value for a 50 years period of density of 1.0 is 126.74 lac per hectare (As per Forest Conservation Act 1980). By considering minimum 0.4 density, the ecological gain for this project would be <math>126.74 \text{ lac} \times 0.4 \times 127.1592 = \text{Rs. } 6,446.4628 \text{ Lakh}</math></p>
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#### Summary of Cost-Benefit Analysis for the project.

Sr. No.	Loss in Lac	Benefit in Lac
1	Ecosystem Services losses = <b>Rs. 278.478 Lac.</b>	ecological gain for this project would be $126.74 \text{ lac} \times 0.4 \times 127.1592 = \text{Rs. } 6,446.4628 \text{ Lakh}$
2	Loss of animal husbandry, productivity including loss of fodder = <b>Rs. 27.8478 Lac</b>	<p>9050- man days will be generated for unskilled/semi-skilled worker in terms of Salary and Wages @ Rs. 500/day (average) = <math>\text{Rs. } 500 \times 9050 = 45.25 \text{ Lac.}</math></p> <p>Basic living amenities including alternative fuel (LPG solar cooker etc) will be supplied to labours/workers in construction period by contractor-2 years.</p> <p>Number of labours at peak time-225 Approx. 50% labour assume to be local.</p> <p>Per head cost of fuel- Rs. 2.00/day for rest 112 labours. Total Cost = <math>\text{Rs. } 2.00 \times 112 \text{ labours} \times 730 \text{ days} = \text{Rs. } 163520.00/-</math> of <b>Rs. 1.64 Lac.</b></p>
3	Loss of public facility = <b>Rs. 3234.00 Lac</b>	
4	Possession value of Forest land diverted = <b>Rs. 3,178.98 Lacs</b>	
5	Habitat Fragmentation Cost = <b>Rs. 139.239 Lac</b>	



6	Compensatory afforestation and soil & moisture conservation cost= Rs. 190.7388Lakhs.	
7	Total Cost/Loss =278.478 Lac+27.8478+3234.00 Lac+3178.98Lakh + 139.239 Lac + 190.7388 Lac = <b>Rs. 7,049.2836 Lac</b>	Total gain/benefit from project = Rs. <b>6,446.4628</b> lac + 45.25 Lac + 1.64 Lac = <b>Rs. 6,493.3528Lac.</b>

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Cost Benefit Ratio = Total Benefit/Total Loss = 7049.2836/ 6,493.3528 =1.10 which is >1, so project is found valuable based on given/above described criteria.

Date:

Place:

परियोजना निदेशक  
भारतीय राष्ट्रीय राजमार्ग  
परियोजना कार्यान्वयन इकाई