

Attachment – 3

COST BENEFIT ANALYSIS FOR DIVERSION OF PROTECTED (PF) FOREST LAND

Name of Project Road- Forest Land Diversion proposal for "Improvement and Up-gradation to 4-lane configuration of Meerut-Nazibabad section of NH-119 between Km 39+165 to Km 78+635 in the state of Uttar Pradesh".

Nature of Proposal: Diversion of 38.8514 Ha. of Protected, Reserve and Forest land in Hastinapur Wildlife Sanctuary Area under FCA, 1980 for the purpose of widening of existing road.

Total Length of Project road- = 39.470 km

Total No. of District through which proposed project road alignment traverse – 03 Nos i.e Meerut, Muzaffar Nagar & Bijnor

Total length of the project road along the Protected Forest

- (a) Under Meerut Forest division = Km 39+165 to Km 48+400= 9.235 km
- (b) Under Muzaffarnagar Forest Division=Km48+400 to 66+500= 18.100 Km
- (c) Under Bijnor forest division = Km 66+500 to Km 78+635= 12.135 km

Total Forest area proposed for diversion

- (a) Under Meerut Forest division = 0.000 Ha.
- (b) Under Muzaffarnagar forest division = 27.7284 Ha.
- (c) Under Bijnor forest division=11.1230 Ha

Total Required Forest Land = 38.8514 Ha.

Purpose: The Cost of Benefit Analysis is being undertaken for proposed Diversion of Forest land for widening (four laning) of existing road for above said project.

Cost Benefit Analysis as per Guideline for Forest Land Diversion- August 2017

Table -A: Cases Under Which a Cost- benefit analysis for forest diversion is required

S. No.	Nature of Proposal	Applicable / not applicable	Remarks
1	All categories of proposal involving forest land up to 20 hectares in plains and up to 5 hectares in hills	Not applicable	These proposals may be considered on a case-to-case basis and value judgement.
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 assessed to help ascertain 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 detrimental to protection and conservation of proposals would be rarely entertained.
4	All other proposal involving forestland more than 20 hectare in plains and more than 5 hectares in hills including roads, transmission lines,	<u>Applicable</u>	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.

Santosh Kumar Bajpai
 Project Director
 National Highways Authority of India
 PTU - Meerut

minor, medium and major irrigation projects, hydro projects, mining activity, railway line, location specific installations like micro-wave stations, auto repeater centers, TV towers etc.		
---	--	--

Since the proposal is for diversion of forest land measuring more than 20 hectare in plane area for road project, cost benefit analysis report is applicable.

Table -B: Estimation of cost of forest diversion

S. No.	Parameters	Given Guideline	Evaluation
1	Ecosystem services losses due to proposed forest diversion	<p>Economic value of loss of ecosystem services due to diversion of forests shall be the not present value (NPV) of the forest land being diverted as prescribed by Central Government (MoEF & 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 services loss;- The concept of Net Present Value of the forest land diverted is a 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 value of various ecosystem services and other environmental services in monetary terms which the forest would have provided if the forest would not have been diverted.</p>	<p>Different type of Forest land is identified which are located inside WLS as well outside the boundary of WLS.</p> <p>NPV is considered Rs 12,28,590/- per hectare for Eco class-III forest having density 0.6. This rate is as per previous proposal the same road section falling under district Meerut and Naziababad.</p> <p>Forest Area outside WLS= 1.11718 ha. Forest Area inside WLS= 37.73422 ha.</p> <p>NPV for Forest Area outside WLS= Rs 12,28,590/- x 1.11718 ha = Rs 13,72,556.18/-</p> <p>NPV for Forest Area inside WLS= Rs 12,28,590 x 37.73422 ha x 5 times =Rs 23,17,99,427/-</p> <p>Total NPV= Rs 13,72,556.18/- + 23,17,99,427= 23,31,71,983/-</p> <p>Or Rs 2331.72 lakh</p>
2	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.	<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.</p>

Santosh Kumar Bajpal
 Project Director
 National Highways Authority of India
 PTU - Meerut

			<p>Therefore, loss of fodder as estimated for about 38.8514 hect. will be $38.8514 \times 5 \times 100 = \text{Rs } 19,425.7/\text{yr}$. X 50 years = Rs. 971285.00/- or 9.71 lakh</p> <p>Further considering 10% of NPV will be = Rs 2331.72 lakh (NPV) x 0.1=233.172 lakh</p> <p>So considered amount (maximum one) is Rs 233.172 lakh.</p>
3	Cost of human resettlement	To be quantified and expressed in monetary terms on actual terms as per approved R&R plan.	NIL as no human resettlement is required.
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	<p>No loss of public infrastructure like Roads, hospital etc are investigated.</p> <p>However, there will be some utility shifting like, electricity pole, telephone line, OFC cable etc, from Proposed RoW located in forest land.</p> <p>The likely cost of these utility shifting is estimated Rs 500 lakhs. (5.0 crore)</p>
5	Possession value of forest land diverted	<p>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> <p>Note2:- 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 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</p>	<p>Possession Value of forest land will be (considering 30% of NPV) = $0.3 \times 2331.72 = 699.516 \text{ lakh}$</p> <p>Average Per hectare land rate along the project highway in district Meerut, Muzaffarnagar & Bijnor is in between 200 to 225 lakhs.</p> <p>For estimation purpose average rate considered along the road is 212.5 lakh per hectare</p> <p>So, Possession value of forest land (as per average circle rate) = $38.8514 \times 212.5 \text{ lakh} = 8255.92 \text{ lakh}$</p> <p>So Considered amount (maximum one) is Rs 8255.92 lakh.</p>

Santosh Kumar Bajpai
 Project Director
 National Highways Authority of India
 PIU - Meerut

		of forests.	
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. No resettlement & 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. There will not be any losses on this account as diversion of the forest land of this project will not affect any house or structure in protected/reserve forest/ WL Area which is basically a linear plantation (other than realignment/bypass portion).
8	Habitat fragmentation Cost	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.	Habitat fragmentation cost is 50% of NPV that is Rs 2331.72 x 0.5= 1165.86 lakh
9	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.	Keeping in view of similar calculation in same district (i.e Bijnor) of Uttar Pradesh, the CA cost per hectare is considered Rs 1.13 lakh per hectare (including maintenance with 10 years) for estimation purpose. So, CA cost 38.8514 hect. x 2 x Rs 1.13 lakh = 87.80 lakh

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

S. No.	Parameter	Given Guideline	Evaluation
1	Increase in productively attribute to the specific project	To be quantified & expressed in monetary terms avoiding double counting	The proposed project for which diversion of forest land is sought is for widening of Existing Road. The project road will improve accessibility to the region. This will help in both economic & social development in the region. The project will enable smooth accessibility in the region by which people of the region will be directly benefited. This will accelerate industrialization/ commercialization in region and the same will directly generate maximum

Santosh Kumar Bapat
Project Director
National Highways Authority of India
PTU - Meerut

			<p>employment opportunities in these areas and boosting up the economy of the region and state. Again, directly the project will have the potential for temporary employment generation for local people 350-400 for 2 years generating 240000 man-days during construction period.</p> <p>Also, during operation period (including Toll operation, which will be continued for approx. 15 year) approx. 100 number of people will be employed on permanent basis.</p> <p>Due to Up gradation of the existing highway, there will be overall development of the project area in terms of transportation of agriculture produces, easy access to education, health marked etc.</p> <p>Project road is to be developed as 4 lane road to provide alternative connectivity to Haridwar and for Kanwar Yatra, an annual pilgrimage of devotees of Shiva, known as Kanvarias, to Hindu pilgrimage places of Haridwar, Gaumukh and Gangotri in Uttarakhand.</p>
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.</p> <p>Improved road connectivity will help in better implementation and management of government schemes. It will provide fast and economical transport of goods. After completion, the local people and industries situated in the area will be greatly benefited. The widening of project road will provide safe, fast, economical and environment friendly transportation to the State which in term will accelerate the rate of growth in this area.</p> <p>"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. However, they could not be 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	<p>The proposed road section which is part of NH-119, traverses through Dehra district i.e, Meerut, Muzaffarnagar & Bijnor which further</p> <p style="text-align: right;"> Santosh Kumar Bajpai Project Director National Highways Authority of India PIU - Meerut 19/11/22 </p>

			<p>connect Paudi, Muzaffar Nagar and Paudi (Uttarakhand).</p> <p>The population of these districts are; Meerut 3,443,689 –, Bijnor- 3,682,713 & Muzaffar Nagar - 575,548 total 7701950 persons which are directly benefited in addition to lakhs of neighbour district commuters as well as long distance travellers and fright.</p>
4	Economic benefits due to of direct and indirect employment due to the project.	As per detailed project report.	<p>Direct employment to 350-400 for 2-year during construction period (accordingly 25 days x 24-month x 400 labours= 240000 Man days) people and substantial indirect employment as a result of development of infrastructure and will also provide direct benefit to small scale industrial units in the area.</p> <p>Approx. 100 persons will be engaged permanently as staff at toll plaza and in other road operation activities.</p>
5	Economic benefit due to Compensatory afforestation	<p>Benefit from such compensatory forestation accruing over next 50 years monetized and discounted to the present value should be included as benefits of Compensatory afforestation.</p> <p>*for benefit of CA the guideline of the Ministry for NPV estimation may be consulted.</p>	<p>In lieu of total trees to be removed from Proposed PRow in protected forest land along the project road, it is proposed to undertake at least twice of the affected trees as compensatory afforestation and as per Forest (Conservation) Act). So, the net productivity will increase.</p> <p>In wildlife area, realignment / bypass are also proposed, however these areas are mostly agricultural land and not a dense forest.</p> <p>Apart from compensatory plantation, roadside plantation as part of green belt development is also provisioned. The compensatory afforestation will be taken up in about 38.8514 x 2= 77.7028 hectare of Degraded Forest Land which is at least two times of the area proposed to be diverted.</p> <p>The compensatory afforestation will be done on 77.7028 hectare of degraded forest land, which is down the line would be having a density of minimum 0.7. The ecological value for a 50 years period for the density of 1.0 is INR 126.74 lacs per hectare (As per Forest Conservation Act 1980). By considering minimum 0.7 density the ecological gain for this project would be INR 6893.63 lakh.</p>

Summary of Cost-Benefit Analysis for the Project.

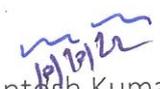
S. No	Loss (in Lakhs)	Benefit (in Lakhs)
		Santosh Kumar Bajpai Project Director National Highways Authority of India PIU - Meerut

S. No	Loss (in Lakhs)	Benefit (in Lakhs)
1	Ecosystem services losses Rs 2331.72 lakhs.	Ecological gain from compensatory afforestation on 77.7028 (at least) hectare on degraded land would be Rs = 6893.63 lakh
2	Loss of animal husbandry productivity, including loss of fodder= Rs 233.172 lakh	240000-Man days will be generated for unskilled/semi-skilled worker in terms of Salary and Wages @ Rs 500/day# (average) = Rs 1200.0 lakh {# Minimum wages in Uttar Pradesh is Rs 174.00, but for considering actual practical wages including lodging the average cost per day for semiskilled / labourer is approx. Rs 500 per day.} Permanent Employment for 100 Person (approx.) @ Rs 250000 (average annual income) for toll period 26 years (commonly) = 100 x 250000 x 26= 6500.00 lakh. Basic living amenities including alternative fuel (LPG, Solar Cooker etc) will be supplied to labours/workers. Construction period- 2 years Number of labours at peak time – 400 Approx 20% labour assume to be local Per head cost of fuel –Rs.20/ per day for rest 320 labours Total cost= Rs 20x320 labours x 730 days= Rs 2190000/- or Rs 46.72 lakhs
3	Loss of public facilities = 500 lakh	
4	Possession Value of Forest land diverted=8255.92 lakh.	
5	Habitat fragmentation cost = 1165.86 lakh	
6	Compensatory afforestation and soil & moisture conservation cost= 87.80 lakh	
	Total cost/Loss = Rs 2331.72 lakh + Rs 233.172 lakh + Rs 500 lakh+ Rs 8255.92 lakh+ Rs 1165.86 lakh+ 87.80 lakh =12574.472 lakh	Total gain/ benefit from project= Rs 6893.63 lakh + Rs 1200.0 lakh + Rs 6500.00 lakh + Rs 46.72 lakhs = 14640.35 lakh

Cost Benefit Ratio = Total Benefit/ Total Loss = 14640.35: 12574.472 = 1.1642 which is > 1, so project is found viable based on given/above-described criteria.

Date: 10/10/2022

Place: Meerut


 Santosh Kumar Bajpai
 Project Director
 Project Implementation Unit
 Meerut, Uttar Pradesh
 National Highways Authority of India
 PIU - Meerut