Cost Benefit Analysis For Diversion of Protected Forest (PF) Land

Name of Project: Rehabilitation and Up-gradation to 4-lane with paved shoulders configuration from Bhadwas to Kalyanpur section (Km 186.000 to Km 229.000)of NH-91 in Etah Districts in the State of Uttar Pradesh.

Nature of Proposal: Diversion of 65.495 ha. of Protected Forest Land from Km 186.000 to Km. 229.00 in Dist. Etah.

Total Length of the project road section: - 45.170 K.M.

Number of District through which project road traverses-01 No. i.e. Etah

Total length of the project road along the Protected Forest/Reserve Forest.

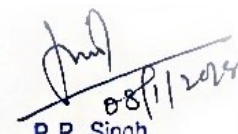Under Social Forestry Division, Etah Existing Km. 186.000 To 229.000) = 45.170 (Design Length)

Total Forest Area Proposed For Diversion

Under Social Forestry Division, Etah = 65.495 Ha.

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

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

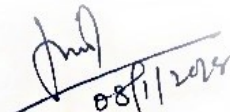| Sr. No.	Nature of Project	Applicable/Not Applicable	Remarks
1	All categories of proposal involving forest land upto 20 ha. In plains and upto 5 Ha. In hills	Not Applicable	These proposals may be considered on a case to case basis and value judgements.
2	Proposal for defense installation purpose and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

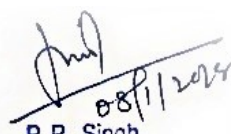| Sr. No.	Nature of Project	Applicable/Not Applicable	Remarks
	microwave stations, auto repair centres, TV towers etc.		

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 Etah District

Sr. No.	Parameters	Given Guideline	Evaluation
1	Ecosystem Services losses due to Proposed forest diversion	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&CC) 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. 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 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.	NPV value (as per of forest Conservation act 1980 is in between Rs. 5.8 and 9.2 lac per hectare. Accordingly, NPV value for proposed diverted land is calculated by DFO Office, Etah is = 525.924 Lac.
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.	Loss of Animal husbandry due to proposed diversion is very moderate and calculated below.

Sr. No.	Parameters	Given Guideline	Evaluation
			Gross Loss @ 5 ton/Ha/year @ Rs. 100/- per tonne. Therefore, loss of fodder as estimated for about 65.495 Ha. Will be 65.495 X5X100=32747.500/Yr X 50 years=Rs. 1637375/- (16.737 Lac) Further considering 10% of NPV will be = 525.924 lack X 0.1 = 52.5924 Lac. So considered amount (maximum one) is Rs. 52.5924 Lac.
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.	No loss of public infrastructure like Roads, hospital etc are investigated. However, there will be some utility shifting like, electricity pole, telephone line, OFC cable etc from proposed ROW located in forest land. The likely cost of these utility shifting is estimated Rs. 487.00 Lac
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. 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,	Possession value of forest land will be (considering 30% of NPV) = 0.3 X 525.924 = 157.777 Lac Per hectare land rate along the highway in district Etah is approx. 85 lac/Ha. So possession value of forest land (as per average circle rate) = 65.495 Ha. X 85.00Lac = 5567.075

08/1/2025
P. P. Singh
Project Director
National Highways Authority of India,
PIU-Aligarh

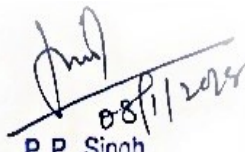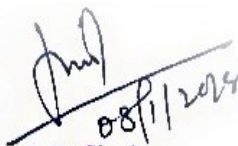| Sr. No.	Parameters	Given Guideline	Evaluation
		Therefore 30% of the net present value (NPV) of forest land diverted or market rate of adjoining area in the district should be added as a cost component as "possession value of forest land" in addition to the environmental cost due to loss of forests.	So considered amount (Maximum one) is Rs. 5567.075 .Lac
6	Cost of Suffering to ousters	The social cost of rehabilitation of oustes (in additional 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 oustes should have earned in two years had he not 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 to this project will not affect any house or structure in protected forest area which is basically a linear plantation.
7	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. 525.924 X 50% = 262.962 Lac.
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.	As per DFO Office, Etah CA cost estimated Rs. . 16983117/- for 65.495 Ha. Forest land to be diverted.

P. P. Singh
Project Director
National Highways Authority of India,
PIU-Aligarh
08/11/2024

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

Sr. No.	Parameter	Given guidelines	Evaluation
1	Increase in productivity attributable to the specific project	To be quantified & expressed in monetary terms avoiding double counting.	Socio economic benefits due to the road project will provide the • connectivity to state capital to district head quarter • with high speed corridor leading to reduced travel time and fuel consumption. • The benefits to trade specially in moment of perishable goods. • Access to new industrial areas. • Overall enhancement of socio-economic condition of the area along the project corridor. • Though overall mission to increase the GDP of the said region and make it comparable/abobe the nation GDP Again directly approximately 146000 man days of temporary and 1000 permanent employment will be generated during the construction of the Project for a period of 2 years
2	Benefits to economy due to specific project	The Incremental economic benefit in monetary terms due to the activities attributed to the specific project.	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. After completion of project, the local people and industries situated in the area will be greatly benefited. The widening of project road will provide safe, fast, economic and environmental 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. "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.
3	No. of population benefited due to specific project	As per detailed project report.	The Population of 118517 People from district Etah will be benefited directly.
4	Economic benefit due to direct and indirect Employment Potential	As per detailed project report.	Approximately 146000-man days of temporary and 1000 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 monetised and discounted to the present value should be included as benefit of CA the guideline of the Ministry for NPV estimation may be consulted.	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. Apart from compensatory plantation and on road divider plantation. The compensatory afforestation will be taken up in about 130.99 Ha of degraded forest land which is two times of the area proposed to be diverted. The Compensatory Afforestation will be done in 130.99 Ha. Of degraded forest land, which is down the line would be having a density of minimum 0.8. 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 0.8 density, the ecological gain for this project would be 126.74lacX0.8X130.99=13281.34 lac

P. P. Singh
Project Director
National Highways Authority of India,
PIU-Aligarh

Summary of Cost-Benefit Analysis for the project.

Sr. No.	Loss in Lac	Benefit in Lac
1	Ecosystem Services losses = Rs. 525.924 Lac.	ecological gain for this project would be 126.74lacX0.8X130.99= Rs. 13281.34 lac
2	Loss of animal husbandry, productivity including loss of fodder = Rs. 52.5924 Lac	146000- man days will be generated for unskilled/semi-skilled worker in terms of Salary and Wages @ Rs. 500/day (average) = Rs. 500X 146000=730.00 Lac. Basic living amenities including alternative fuel (LPG solar cooker etc) will be supplied to labours/workers in construction period by contractor-2 years. Number of labours at peak time-225 Approx.. 50% labour assume to be local. Per head cost of fuel- Rs. 2.00/day for rest 112 labours. Total Cost = Rs. 2.00 X 112 labours X 730 days = Rs. 163520.00/- of Rs. 1.64 Lac.
3	Loss of public facility = Rs. 487 Lac	
4	Possession value of forest land diverted = Rs. 5567.075 .Lac	
5	Habitat Fragmentation Cost = Rs. 262.962 Lac	
6	Compensatory afforestation and soil & moisture conservation cost= Rs. 169.8311 Lac.	
7	Total Cost/Loss = 525.924 Lac+ . 52.5924 + 487 Lac+ 5567.075 Lac + 262.9620 Lac + 169.831 Lac = 7065.384 Lac	Total gain/benefit from project = Rs. 13281.34 lac + 730.00 Lac + 1.64 Lac = 14012.98 Lac.

Cost Benefit Ratio = Total Benefit/Total Loss = 14012.98/7065.384 =1.98 which is >1, so project is found valuable based on given/above described criteria.

P. P. Singh
Project Director
National Highways Authority of India,
PIU-Aligarh