

COST BENEFIT ANALYSIS IN ACCORDANCE WITH GOI FC GUIDELINES NO-7-69 / 2011-FC DATED 01-08-2017

Name of Project: Development of Package-17 (KM 515+000 to KM 566+475) of Phase-II of Delhi-Katra Expressway

Nature of Proposal: Diversion of **36.2511 ha** of Forest land under FCA, 1980 for road construction

Purpose: The Cost Benefit analysis has been undertaken for proposed Diversion of Forest Land being affected due to proposed project from KM 515+000 to KM 566+475 in the Union Territory of J&K.

Total Length of the Project: 51.475 km

Number of districts involve: 02


Number of forest divisions involve: 03

| S. No. | Forest Division | Proposed Forest Area for Diversion (ha) |
|--------------|-----------------|---|
| 1 | Jammu | 13.4242 |
| 2 | Reasi | 21.3235 |
| 3 | Jammu Wildlife | 1.5034 |
| Total | | 36.2511 |

Table A: Cases under which a Cost-benefit analysis for forest diversion are required

| Sl. 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 | Applicable | These proposals may be considered a case to case basis and value judgments. |
| 2 | Proposed for defense installation purpose and oil prospecting only | Not Applicable | In view of national priority accorded to these sectors, the proposal 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 in protection and conservation of proposals would be rarely entertained. |
| 4 | All other proposal involving forest land more than 20 hectares in plain and more than 5 hectares in hills including roads, transmission line, minor, medium and major irrigation projects, hydro projects, mining activity, railway line, location specific installations like microwave stations, auto repeater centers, TV tower etc. | 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 hectare in plain area and more than 5 hectares in hills for the road project, cost benefit analysis report is applicable


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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 forest shall be the net 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>NPV has been taken as INR 8.45 lakhs per hectare for Jammu Forest Division (Sub-Tropical broad leaved hill forest (DF)) & 8.45 lakhs per hectare for Reasi Forest Division (Sub-Tropical pine forest (DF)).</p> <p>Jammu Forest Division- 8.45 x 13.4242 = 113.43449 Lakhs Reasi Forest Division- 8.45x 21.3235 = 180.183575 Lakhs Jammu Wildlife Division- 8.45 x 5 x 1.5034 = 63.51865 Lakhs</p> <p>Therefore total losses = 357.136715 Lakhs</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>The forest land proposed for diversion is Reserved Forest as notified by Govt. of India. No grazing activity is being / has been carried out on these patches. Therefore, no loss of animal husbandry productivity including loss of fodder will take place.</p> <p>10% of NPV</p> <p>Jammu Forest Division- 10% of NPV (113.43449 lakhs) = 11.343449 lakhs Reasi Forest Division- 10% of NPV (180.183575 lakhs) = 18.0183575 lakhs Jammu Wildlife Division- 10% of NPV (63.51865 lakhs)= 6.351865 lakhs</p> <p>So considered amount is INR 35.71367 Lakhs.</p> |

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| S. No | Parameters | Given Guideline | Evaluation |
|-------|--|--|--|
| 3 | Cost of human resettlement | To be quantified and expressed in monetary terms as per approved R & R plan. | NIL No resettlement in the forest land proposed for diversion. |
| 4 | Loss of public facilities and administrative infrastructure (Roads, buildings School, 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 basis at the time of diversion. | No loss of public facilities and administrative infrastructure on forest land. |
| 5 | Possession value of forest land diverted | 30% of environment 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 land whichever is maximum | Possession value of Forest Land= 30 % of NPV Jammu Forest Division- 30% of NPV (113.43449 lakhs) = 34.030347 Lakhs Reasi Forest Division- 30% of NPV (180.183575 lakhs) = 54.0550725 Lakhs Jammu Wildlife Division- 30% of NPV (63.51865 lakhs)= 19.055595 Lakhs Total Possession value of Forest Land- 107.1410145 Lakhs |
| 6 | Cost of Suffering to oustees | The social cost of rehabilitation of Ousteas (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 as no Resettlement and Rehabilitation is required in forest land proposed to be diverted. |
| 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= 50% of NPV Jammu Forest Division- 50% of NPV (113.43449 lakhs) = 56.717245 Lakhs Reasi Forest Division- 50% of NPV (180.183575 lakhs) = |

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| S. No | Parameters | Given Guideline | Evaluation |
|-------|--|--|---|
| | | | 90.0917875 Lakhs Jammu Wildlife Division- 50% of NPV (63.51865 lakhs)= 31.759325 Lakhs Total Habitat fragmentation Cost- 178.5683575 Lakhs |
| 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 | Total 72.5022 Hectare of degraded forest land which is about two times of the forest area proposed for diversion has been proposed for CA in lieu of 36.2511 ha forest land. Jammu Forest Division - 26.8484 x 5.29670= 142.20792 Lakhs Reasi Forest Division- 42.6470 x 5.29670= 225.888365 Lakhs Jammu Wildlife Division- 3.0068 x 5.29670= 15.9261176 Lakhs Cost of CA is INR 384.0224026 Lakhs(@ 5.29670 lakhs per ha |

Table C: Existing Guidelines for estimating benefits of forest land diversion in CBA

| S. No | Parameters | Given Guideline | Evaluation |
|-------|---|---|--|
| 1 | Increase in productivity attributable to the specific project | To be quantified and expressed in monetary terms avoiding double counting | The proposal for which diversion of forest land is sought is for proposed project from KM 515+000 to KM 566+475 in the Union Territory of J&K. The proposed project shall reduce traffic congestion and result in time savings. Moreover, the proposed expansion will improve road safety, save fuel and cost, generate employment, boost tourism and commercial activities in nearby areas etc. The proposed project shall improve trade efficiency and bring economic growth in the |

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| S. No | Parameters | Given Guideline | Evaluation |
|-------|---|--|---|
| | | | <p>region.</p> <p>Again, directly the project will have the potential for employment generation for local people during the construction period. The proposed project does not involve any manufacturing or production. Hence, this section is not applicable. Monetary benefits due to increase in productivity is NIL.</p> |
| 2 | Benefits of economy due to the 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, after completion of project, the local people and industries situated in the area will be greatly benefited. The project road will provide safe and fast, economical and environment friendly transportation to the State, which in term will accelerate the rate of growth in this area.</p> <p>The expansion of existing highway shall decongest the highway and results in time and fuel savings.</p> <p>Average Annual Daily Traffic = 10662 Passenger Car Unit (PCU).</p> <p>Fuel saving = avg. 1.2 Litre per PCU</p> <p>Average fuel cost = INR 102 per Litre</p> <p>Fuel saving on 10662 PCU = $1.2 \times 10662 = 12,794.4$ Litres per day</p> <p>Savings (in monetary terms) = $12794.4 \times 102 = 1305028.8$ INR = INR 13.050288 Lakhs</p> <p>Total benefits in 40 years $= 13.050288 \times 40 \times 365 = \text{INR } 190534.205 \text{ Lakhs}$</p> |
| 3 | No. of population benefited due to specific project | As per the detailed project report | Population of Jammu district- 1,529,958 & Reasi district 314,667 will be benefitted due to proposed development. |

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| S. No | Parameters | Given Guideline | Evaluation |
|-------|--|--|---|
| 4 | Economic benefits due to of direct and indirect employment due to the project. | As per the detailed project report | A total of 947140 man-days employment will be generated during construction phase for skilled/unskilled labour. Base wage rate for the year 2020 – 21 is INR 225 per day. Total financial implication will come out to be = $947140 \times 225 =$ INR 2131.06500 Lakhs |
| 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 considered. | In lieu of total trees to be removed from the proposed Row in forest land along the project road, it is proposed to undertake at least twice of affected area as Compensatory afforestation as per Forest Conservation Act, 1980 to increase the net productivity. The Compensatory Afforestation will be done in 72.5022 ha 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 Lakhs per hectare. By considering minimum 0.4 density the ecological gain for the project would be $INR\ 126.74 \times 0.4 \times 72.5022 =$ INR 3675.57153 Lakhs |

Summary of Cost –Benefit Analysis for the Project


| S.No | Cost (in Lakh) | Benefit (Lakh) |
|------|--|---|
| 1 | Ecosystem services losses = INR 357.136715 Lakhs | Benefits of economy due to the specific project = INR 190534.205 Lakhs |
| 2 | Loss of Animal Husbandry Productivity including loss of Fodder = INR 35.71367 Lakhs. | Economic benefits due to of direct and indirect employment due to the project = INR 2131.06500 Lakhs |
| 3 | Possession Value of Forest Land diverted = Rs 107.1410145 Lakhs | Ecology gains due to Compensatory Afforestation = INR 3675.57153 lakhs |
| 4 | Habitat Fragmentation Cost = INR 178.5683575 Lakhs | |
| 5 | Compensatory Afforestation and Soil and Moisture Conservation = INR 384.0224026 Lakhs | |
| | Total Cost = INR 1062.582 Lakhs | Total Benefit = INR 196340.8 Lakhs |

Therefore, project will have multifold benefit on the economy.

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Place: Jammu


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