

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

Name of Project: Construction of 6-lane structures on NH-1 Section (KM 407+000 to KM 444+794) on Brownfield Amritsar Spur of Delhi-Amritsar-Katra Expressway

Nature of Proposal: Diversion of 39.7656 ha of Forest land under FCA, 1980 for structure improvement

Purpose: The Cost Benefit analysis has been undertaken for proposed Diversion of Forest Land being affected due to rectification of Blackspots on existing NH-1 from KM 407+000 to KM 444+794 in the State of Punjab.

Total Length of the Project: 15.586 km

Number of districts involve: 02

Number of forest divisions involve: 02

| Sl. No. | Forest Division | Proposed Forest Area for Diversion (ha) |
|---------|-----------------|---|
| 1 | Jalandhar | 9.2556 |
| 2 | Amritsar | 30.510 |
| Total | | 39.7656 |

Table A: Cases under which a Cost-benefit analysis for forest diversion is 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 | Not 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 | 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. |

Divisional Forest Officer,

Jalandhar Forest Division

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Amritsar

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| SL No. | Nature of Proposal | Applicable/Not Applicable | Remarks |
|--------|---|---------------------------|---------|
| | activity, railway line, location specific installations like microwave stations, auto repeater centers, TV tower etc. | | |

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

Table B: Estimation of Cost of forest diversion

| SL No. | Parameters | Given Guideline | Evaluation |
|--------|---|--|---|
| 1 | Ecosystem services losses due to proposed forest diversion | 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) 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 | NPV has been taken as INR 9,57,780/- (~9.58) lakhs per hectare (Tropical Dry Deciduous Forest with density less than 0.7) Therefore losses = 9.58 x 39.7656 = 380.954448 Lakhs |
| 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 | The forest land proposed for diversion is roadside plantation notified by Govt. of Punjab as Protected Forest. 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. 10% of NPV =10% of NPV (380.954448 lakhs) = 38.0954448 lakhs. So considered amount is INR 380.954448 Lakhs. |

CS
Divisional Forest Officer,
Jalandhar Forest Division,
Jalandhar.

[Signature]
परियोजना निदेशक/Project Director
राष्ट्रीय राजमार्ग प्राधिकरण
National Highways Authority of India
परियोजना कार्यान्वयन इकाई, अमृतसर
PIU-Amritsar

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| SL 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 = 30% of 380.954448 lakhs = 114.2863344 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 = 50% of 380.954448 Lakhs = 190.477224 Lakhs |
| 8 | Compensatory | The actual cost of compensatory | Total 79.53 Hectare of |

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| SL No. | Parameters | Given Guideline | Evaluation |
|--------|---|--|---|
| | afforestation and soil & moisture conservation cost | afforestation and soil & moisture conservation and its maintenance in future at present discounted value | degraded forest land which is about two times of the forest area proposed for diversion has been proposed for CA in lieu of 39.7656 ha forest land. Cost of CA is INR 453.321 Lakhs (@ 5.70 lakhs per ha) |

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

| SL 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 | <p>The proposal for which diversion of forest land is sought is for rectification of Blackspots on existing NH-1 from KM 407+000 to KM 444+794 in the state of Punjab.</p> <p>The proposed expansion 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 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. | 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 |

National Highways Authority of India
 National Highways Division
 Ministry of Road Transport and Highways
 New Delhi

Divisional Forest Officer,
 Jalandhar Forest Division
 Jalandhar.

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| SL No. | Parameters | Given Guideline | Evaluation |
|--------|--|---|---|
| | | | <p>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 = 10909 Passenger Car Unit (PCU).</p> <p>Fuel saving = avg. 1.5 Litre per PCU</p> <p>Average fuel cost = INR 90 per Litre</p> <p>Fuel saving on 10909 PCU = 1.5 x 10909 = 16363.5 Litres per day</p> <p>Savings (in monetary terms) = 16363.5 x 90 = 1472715 INR = INR 14.72715 Lakhs</p> |
| | | | <p>Total benefits in 40 years = 14.72715 x 40 x 365 = INR 215016.39 Lakhs</p> |
| 3 | No. of population benefited due to specific project | As per the detailed project report | Population of Jalandhar district (2193590), Kapurthala district (815168) and Amritsar district (2490656) will be benefitted due to proposed development. |
| 4 | Economic benefits due to of direct and indirect employment due to the project. | As per the detailed project report | <p>A total of 430174 man-days employment will be generated during construction phase for skilled/unskilled labour.</p> <p>Base wage rate for the year 2019 – 20 is INR360 per day.</p> <p>Total financial implication will come out to be = 430174x360= INR 1548.6264 Lakhs</p> |
| 5 | Economic benefits due to Compensatory Afforestation | Benefits from such compensatory forestation accruing over next 50 years monetized and discounted to the | 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 |

परियोजना निदेशक/Project Director
भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
National Highways Authority of India
परियोजना कार्यान्वयन इकाई, अमृतसर
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Divisional Forest Officer,
Jalandhar Forest Division,
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|--------|------------|--|---|
| | | 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. | increase the net productivity. The Compensatory Afforestation will be done in 79.53 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 $126.74 \times 0.4 \times 79.53 =$ INR 4031.85288 Lakhs |

Summary of Cost –Benefit Analysis for the Project


| SL No. | Cost (in Lakh) | Benefit (Lakh) |
|--------|--|--|
| 1 | Ecosystem services losses = INR 352.720872 Lakhs | Benefits of economy due to the specific project = INR 215016.39 Lakhs |
| 2 | Loss of Animal Husbandry Productivity including loss of Fodder= INR 38.0954448 Lakhs. | Economic benefits due to of direct and indirect employment due to the project = INR 1548.6264 Lakhs |
| 3 | Possession Value of Forest Land diverted = Rs 114.2863344 Lakhs | Ecology gains due to Compensatory Afforestation = INR 4031.85288 lakhs |
| 4 | Habitat Fragmentation Cost = INR 190.477224 Lakhs | |
| 5 | Compensatory Afforestation and Soil and Moisture Conservation = INR 453.321 Lakhs | |
| | Total Cost = INR 1177.134451 Lakhs | Total Benefit = INR 220596.86928 Lakhs |

Cost Benefit Ratio:- $220596.86928/1177.134451 = >1$ Therefore, project will have multifold benefit on the economy.

Date: 12.12.2022

Place: Amritsar


 Divisional Forest Officer,
 Jalandhar Forest Division
 Jalandhar


 (Sunil Yadav)
 Project Director
 NHAI, PIU-Amritsar