

COST BENEFIT ANALYSIS FOR DIVERSION OF FOREST LAND

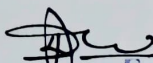
| S.N | Nature of proposal | Applicable/not | Remarks |
|-----|--|----------------|--|
| 1. | All categories of proposal involving forest land up to 20 hectares in plains and up to 5 hectares in hills | Applicable | These proposals May Be Considered on a Case-to-Case basis and Value judgment |
| 2. | Proposal for defense installation purpose and oil prospecting (prospecting) | Not applicable | In a view of a national priority accorded to these proposals would be critically assessed to help ascertain that the upmost minimum |
| 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 forest land more than 20 hectares in plains and more than 5 Hectares in hills including road transmission lines, 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. | Applicable | These are cases where a cost benefit analysis is necessary to determine when diverting the forest land to non forest use is in the overall public interest |

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

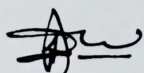
Since the proposal is for diversion of forest land measuring more than 20 hectares in partly plain and partly in hilly area for road project, cost benefit analysis report is applicable.

Table -B: Estimation of cost of forest diversion

| S.N | Parameters | Given Guideline | Evaluation |
|-----|---|--|--|
| 1. | Ecosystem 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>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>NPV Value (as per of forest Handbook/Guideline dated 18/03/2019) of forest land is in between Rs 6,99,000 to Rs 10,43,000 per hectare. Most part of Project road passing through reserved forest area (eco class -2 tropical Dry Deciduous Forest Dense Forest) and per ha. NPV rate is considered Rs.9,39,000 (as per forest Handbook Guideline 18/03/2019). For NPV For 102.324 Ha will be 102.324 Ha x Rs. 9,39,000 = Rs 96082236</p> <p>Total NPV = 960.83 Lakh</p> |


Executive Engineer
 P.W.D.N.H. Division
 Ambikapur (C.G.)

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| 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 moderate and calculated Gross loss @5 ton/ha./year@Rs per ton . Therefore loss of fodder as estimated for about 102.324hect. Will be $102.324 \times 5 \times 100 = \text{Rs } 5162 \text{ Yr} \times 50 \text{ year} = \text{Rs } 2558100/-$ or 25.58 lakh</p> <p>Further Considering 10% of NPV it will be = Rs 96.08 lakh (NPV)$\times 0.1 = 9.60$ Lakh</p> <p>So Considered Amount (Maximum one) is Rs 9.60 Lakh</p> |
| 3. | Cost of human resettlement | To be quantified and expressed in monetary terms on actual terms as per approved R&P plan. | Nil as no human resettlement is required in forest land. |
| 4. | Loss of public facilities and administrative infrastructure (Roads, building, school, dispensary) | 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. However at few locations 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 Lakh (5.00 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 mining etc are unlikely to be returned and remains in possession of the user agencies . therefore 3% 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 environment cost due to loss of forests</p> | <p>Possession value of forest land will be (considering 30% of NPV = $0.3 \times 960.83 \text{ Lakh} = 288.24 \text{ Lakh}$</p> <p>For the purpose of estimation average per hectare average of the rate of all these three districts has been taken which are follows</p> <p>In district Balrampur per hectare rate of nearby area (project road non-forest land is Rs 250000 to 450000 Average Rate = Rs 324000</p> <p>In district Ambikapur per hectare average rate of nearby area (project road) is Rs 870800 to 825300 Average rate = Rs 848050</p> <p>So possession value of forest land (as per average circle rate) = $102.324 \times 5.43 \text{ Lakh} = 555.62 \text{ Lakh}$ so considered amount (maximum one) is Rs 555.62 Lakh</p> |

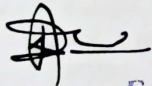


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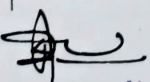
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| 6. | Cost of suffering to oustees | The social cost rehabilitation of oustees (in addition to the cost likely to be incurred in providing residence occupation and social services as per R&R plan) be worked out as 1.5 times of what oustees should have earned in two years had he not been shifted | <p>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.</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 protected/reserve forest area.</p> |
| 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 NPN applicable as a thumb rule. | <p>Habitat fragmentation cost is 50% of NPV that is Rs 960.83 lakh x</p> <p>0.5=480.42 lakh</p> |
| 8. | Compensatory | The actual cost of compensatory afforestation and soil & moisture conservation and its maintenance in future at present d Is counted value. | <p>Keeping in view of similar calculation in neighboring district (i.e.Balrampur) of Chhattisgarh, the CA cost per hectare is considered Rs 878787 per hectare for estimation purpose. It will be further updated once concerned DFO office will provide actual CA estimate.</p> <p>So, CA cost 102.324 hect. x 2 x Rs 878787 = Rs 17,98,42,002 OR Rs 1798.43 Lakh</p> |

Table - c- Existing guideline for estimation benefits of forest diversion in CBA

| SL | Parameter | Given Guideline | Evaluation |
|----|--------------------------|---|--|
| 1 | Increase in productively | To be quantified & expressed monetary terms | The proposed project for which diversion |


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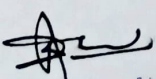
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| | attribute to the specific project | avoiding double counting | <p>of forest land is sought is for widening of Existing Road.</p> <p>The project road will improve accessibility to the le region. This will help in both economic & social development in the region.</p> <p>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 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 approx. 1500 for 2 years generating 9,36,000 mandays during construction period.</p> <p>Also there will be Toll and other road maintenance staff during operation and atleast 100 permanent staff for toll period (approx. 25 years) will be engaged.</p> <p>Due to construction of this 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> |
| 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, tourism, saving in vehicular operation and maintenance cost, better connectivity, safer. journey to commuter and saving of travel time.</p> <p>Improved road connectivity helps 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</p> |


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| | | | emission and man animal conflict and animal kill in road accident 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 | <p>The proposed road section (some section part in Greenfield alignment), traverses through two districts Ambikapur, Balrampur.</p> <p>The population of these districts are; Ambikapur - 112.499 lakh, Balrampur- 26.50 lakh, persons which are directly benefited in addition to lakhs of neighbour district commuters as well as long distance travellers and freight.</p> |
| 4. | Economic benefits due to of direct and indirect employment due to the project | As per detailed project report | Direct employment to approx. 1500 for 2-year during construction period (accordingly 26 days x 24-month x 1500 labors= 9,36,000 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. |
| 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 Reserve/protected forest land along the project road, it is proposed to undertake at compensatory plantation least twice of the affected/diverted forest area as per Forest (Conservation) Act). So, the net productivity will increase.</p> <p>The compensatory afforestation will be taken up in about 102.324Hect. x 2= 204.65 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 204.65 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</p> |

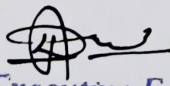
Summary of Cost-Benefit Analysis for the project

| S | Loss (in Lakhs) | Benefit (in Lakhs) |
|---|--|---|
| I | | |
| 1 | Ecosystem services losses RS 2141.31 Lakh | Ecological gain from compensatory afforestation on 456.085 (at least) hectare on degraded land would be RS 1911.92 lakh |


Executive Engineer
 P.W.D.N.H. Division
 Ambikapur (C.G.)

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| 2 | Loss of animal husbandry productivity, including loss of fodder =RS.214.13 lakh | <p>9,36,000 Mam days will generated for unskilled/semiskilled worker in terms Salary and Wages @Rs.500/day (average)=Rs.4680.00 Lakh (# Minimum wages in Chhattisgarh in Rs.344.62 (In zone C) To 364.62 (in Zone A) For unskilled labour , but for considering actual practical wages including lodging the average cost per day for semiskilled / laborer is approx. Rs. 500 per day)</p> <p>Also there will be Toll/ patrol and other road maintenance staff during operation and at least 100 permanent staff for toll period (approx.25 years) will be engaged.</p> <p>Considering average salary Rs.25000 per month, total benefit will be Rs.25000×100×300 Month =7500.00 lakh</p> <p>Basic living amenities including alternative fuel (LPG, Solar Cooker etc.) will be supplied to labours/workers. Construction period -2 Years . Number of labors at peak time -1500</p> |
| 3 | Loss of public facilities = 500 lakh | |
| 4 | POSSESSION Value of forest land diverted =555.62 lakh | |
| 5 | Habitat fragmentation cost= 480.42 lakh. | |
| 6 | Compensatory afforestation and soil & moisture conservation cost =3312.40 lakh. | |
| | Total cost /loss =Rs 960.83+9.60 lakh +Rs 500 lakh+555.62 lakh+Rs480.42 lakh +1798.43 lakh = 4304.9 lakh | Total gain/benefit from project = Rs 1911.92 Lakh + Rs4680.00 lakh + 7500.00 lakh + Rs 175.2 lakh = 14267.12 lakh |

Cost benefit Ratio= Total benefit / Total Loss = **14267.12 : 4304.9 = 3.32** which is >1, so project is found viable based on given/ above- described criteria.


Executive Engineer
 W.D.N.H. Division
 Ambikapur (C.G.)