Cost Benefit Analysis as per GoI Guidelines 01-08-2017

Name of the Project: Development of Vadodara Mumbai Expressway (Phase-II SPUR) from km 0+000 to km 79+783 in the State of Maharashtra

Table-A: Cases under which Cost-Benefit Analysis for Forest Diversion are required

No.	Nature of Proposal	Applicable / Not Applicable	Remarks
1.	All categories of proposals involving forest land upto 20 hectares in plains and upto 5 hectares in hills	Not Applicable	These proposals may be considered in a case to case basis and value judgement
2.	Proposal for defence installation purposes 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 lodges complex and other building construction	Not Applicable	These activities being detrimental to protection and conservation of forest, as a matter of policy, such proposals would be rarely entertained.
4.	All other proposals involving forest land more than 20 hectares in plains and more than 5 hectares in hills including roads, transmission lines, minor, medium and major irrigation projects, hydro projects, mining activity, railway lines, location specific installations like micro-wave stations, auto repeater centres, 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 in the overall public interest

Table-B: Estimation of cost of Forest Diversion

SN	Parameters	Remarks	Response
1.	Ecosystem loses 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 the Central Government (MOEF&CC). *Note: In case of National Parks the NPV shall be ten (10) times the normal NPV and in case of Wildlife Sanctuary the NPV shall be five (5) times the normal NPV or otherwise prescribed by the ministry or any other competent authority*	▪ Type of Forest along the proposed expressway alignment is Tropical Dry Deciduous Forests (Eco-class III) ▪ Approx. NPV value of forests*: 12.29 Lakh / ha ▪ Forest land proposed to be diverted: 111.7321 ha Loss of ecosystem: 12.29 lakh /ha x 111.7321 ha **= Rs. 13.73 Cr.**
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	10% of Rs. 13.73 Cr. (NPV) **= Rs. 1.37 Cr.**
3.	Cost of human resettlement	To be quantified and expressed in monetary terms as per approved	Total cost of human resettlement as per R&R Plan is **Rs. 750 Crore**

SN	Parameters	Remarks	Response
		R&R Plan	
4.	Loss of public facilities and administrative infrastructure (Roads, building, 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 cost basis at the time of diversion	Nil
5.	Possession Value of forest land diverted	30% of environmental 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 forestland whichever is maximum	30% of Rs. 13.73 Cr. (NPV) **= Rs. 4.12 Cr.**
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
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.	50% of Rs. 13.73 Cr. (NPV) **= Rs. 6.86 Cr.**
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	Approx. CA Cost= Rs. 20.0 Lakh/ Ha Total CA Cost = 20 x 111.7321 x 2 **= Rs. 44.69 Cr.**
		Total estimated Cost	**Rs. 820.90 Crore**

Table-C: Existing guidelines for estimating benefit of forest diversion in CBA

S N	Parameters	Remarks	Response
1.	Increase in productivity attributable to the specific project.	To be quantified and expressed in monetary terms avoiding double counting	The economic analysis of the expressway gives an EIRR of 13.43% indicating that the project is economically viable largely due to huge time related savings likely to accrue from the expressway. The Financial analysis of the project gives a project IRR of 16.45% for a concession

S N	Parameters	Remarks	Response
			period of 38 years with no grant from NHAI. The equity IRR is 24.44%.
2.	Benefit to economy due to the specific project	The incremental economic benefit in monetary terms due to the activities attributed to the specific project	The proposed project will provide uninterrupted free flow of traffic and shall result in: ▪ Expressway will reduce travel time from Vadodara to Mumbai to under 4 hours from the present 6 to 7 hours on NH-8 ▪ Saving in travel time & cost ▪ Savings in Vehicle Operating Cost ▪ Reduction in accidents as it will provide safe travel ▪ Reduce pollution load of the area ▪ Will act as a catalyst to the industrial and economic development ▪ Will boost the agricultural activity For 38 year Concession Period, the **NPV shows positive result of Rs.1,422 Cr.**
3.	No. of population benefited due to the specific project	As per the Detailed Project Report	Population of Mumbai Regions, Palghar District and Population of 8 districts Gujarat, Union Territory of Dadra Nagar Haveli (about 8 crore people, either directly or indirectly) will be benefited
4.	Economic benefits due to direct and indirect employment due to the project	As per the Detailed Project Report	Proposed project shall provide direct employment to around 100 people during construction period (2.5 years) and operation period. **Economic benefit = Rs. 37.5 Cr.**
5.	Economic Benefits due to Compensatory afforestation	Benefits from such compensatory afforestation accruing over next 50 years monetised 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 consulted.	**Rs. 5634.78 Lakh/ Rs. 56.35 Crore** (225.9336 x 1000 sapling/ha x Rs. 2,494/unit)
		Total estimated benefit	**Rs. 1515.85 Cr.**

CB ratio (calculation is based on available information) ≅ 1:1.8

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