

COST BENEFIT ANALYSIS (CBA)

Table – B: Estimation cost of forest diversion

SN	Parameters	Details (Rs. in Lakh)	Remarks
1	Ecosystem services losses due to proposed forest diversion	95.24	NPV (As per NPV calculation by DFO/Bilaspur office) @ Rs. 10,05,210/- per ha for proposed diversion of 6.91 ha Forest Land, and NPV @ Rs. 10,05,210/- per ha for Tunnel area, the economic value of loss of eco-system due to diversion of forest land shall be $= (10,05,210 \times 6.91)$ $+ (10,05,210 \times 5.13 \times 0.5)$ =Rs. 95,24,365/-
2	Loss of animal husbandry productivity including loss of fodder	9.52	There is no major Animal Husbandry Activities in proposed area. Hence, 10% of Net Present value (NPV) has been considered which is Rs. 9,52,436/-
3	Cost of human resettlement	0	Since the area proposed for diversion is forest on Govt. land, there is no cost due to Human resettlement.
4	Loss of public facilities and administrative infrastructure (Roads, buildings, schools, dispensaries, electric lines, railways etc.) on which would require forest land if these facilities were diverted due to the project.	150.00	Since the area proposed for diversion is forest on Govt. land, there is no cost due to loss of public facility. However, for alternations to the existing infrastructure facilities like village Roads, Electric lines has been estimated as Rs. 1.5 cr (lump sum) or as per actual which shall be spent as a part of the project.
5	Possession value of forest land diverted	28.57	Since the area proposed for diversion is forest on Govt. land, the possession value is kept as 30% of NPV i.e., 30% of 95,24,365/- = Rs. 28,57,309/-
6	Cost of suffering to oustees	0	Since the area proposed for diversion is forest on Govt. land, there will be


JGM/Project
RVNL, Chandigarh


Chief Project Manager
RVNL, CHANDIGARH

SN	Parameters	Details (Rs. in Lakh)	Remarks
			no displacement of people in forest area. Hence there would be no cost of suffering to oustees
7	Habitat Fragmentation Cost	47.62	As per thumb rule, considering 50% of NPV, the Habitat Fragmentation Cost is 50% of 95,24,365/- = Rs. 47,62,182/-
8	Compensatory afforestation and soil & moisture conservation cost	32.05	The cost of compensatory afforestation and soil & moisture conservation has been kept at Rs. 32.05 lakh (As per CA scheme given by DFO/Bilaspur office) by Forest Department, HP. As per undertaking (Checklist SN-12) given by the User Agency (i.e., in this proposal), and the user department has undertaken to pay the entire amount for compensatory afforestation in lieu of the forest area proposed to be diverted.
Total		363	


 JGM/Project
 RVNL, Chandigarh


 Chief Project Manager
 RVNL, CHANDIGARH

Table – C: Existing guidelines for estimating benefits of forest – diversion in CBA

SN	Parameters	Details
1	Increase in productivity attribute to the specific project	<p>Tangible = Rs. 120384 lakhs</p> <p>Non-Tangible = Mobility is difficult and time taking in mountainous regions. The new rail link from Bhanupali to Beri will thus save time, fuel and people's energy. Saving of time and fuel itself shall help indirectly in increasing the productivity of the commercial and industrial activities for which transportation shall take place along the Railway line.</p>
2	Benefits to economy	<p>It is a proven fact that the infrastructure like railways bring prosperity and development to a region. At present, there is no Railway Infrastructure i.e. Broad Gauge Railway Line in the interior of the State of Himachal Pradesh. The project of construction of new railway line from Bhanupali – Bilaspur – Beri has economic and strategic importance for the region as well as for the Country. In addition, such infrastructure project shall also open new avenues for academics and research as it shall bring a vast learning experience which boosts the technical knowledge for engineers in various fields of specialization. The proposed new line shall not only connect the region with railway network of the Country but also shall be of strategic importance for the Country. With the construction of Broad Gauge Line, the region shall get a push for socio-economic development as variety of job opportunity shall open up for the local residence in the region. At present, there are Cement Factories at and around Barmana in District Bilaspur, HP. The faster as well as heavy haul of the important commodity shall be possible with the construction of new railway line. The area around the project area also consists of many locations of tourist and religious importance like Naina Devi, Manali, Kullu as well as academic importance like Mandi etc. which shall be fed with the construction of new railway line. In all, the regional growth in various social, economic as well as academic fronts shall be beneficial for the state and the nation.</p> <p>Tangible benefits = Rs. 57487.45 lakh.</p> <p>Non Tangible = Improving the accessibility shall help in regional economic development.</p>


 JGM/Project
 RVNL, Chandigarh


 Chief Project Manager
 RVNL, CHANDIGARH

3	No. of population benefited due to the specific project	6596 persons from km 52.015 to 62.900. All those travelling by the rail can save on fuel and time, reducing pollution and carbon emission. For those residing on the region will be less exposed to air pollution than if a road would have been built.
4	Economic benefits due to of direct and indirect employment due to the project	Rs. 82560 lakh (Direct Employment during operation = Rs. 36480 lakh (80x40,000x12x95) + Direct Employment during construction = Rs. 9600 lakh (800x20,000x12x5) + Indirect Employment = Rs. 36480 lakh (320x10,000x12x95)). i.e. in above formula-: Benefit= Person x Salary x Total months in a year x Total Year
5	Economic benefits due to Compensatory Afforestation	The cost of compensatory afforestation and soil & moisture conservation has been kept at Rs. 32.05 lakh (As per CA scheme given by DFO/Bilaspur office) by Forest Department, HP.



JGM/Project
RVNL, Chandigarh



Chief Project Manager
RVNL, CHANDIGARH

Summary of Cost-Benefit Analysis for the Project

SN	Cost (in Lakh)	Benefit (in Lakh)
1	Ecosystem Service Loss Rs. 95,24,365/- = Rs. 95.24 lakh	Total direct and indirect employment generation during construction and operation stage shall be Rs. 82560 lakh
2	Loss of Animal Husbandry including Fodder Rs. 9.52 lakhs	Economic Benefits due to Compensatory Afforestation = Rs. 32.05 lakh Area of compensatory land will be - 14 ha
3	Possession Value of Forest Land Rs. 28.57 lakhs	Benefits to Economy due to Project Rs. 57487.45 lakh
4	Habitat Fragmentation Cost Rs. 47.62 lakh	Tangible increase in productivity = Rs. 120384 lakh
5	Construction cost of project Rs. 116625.63 lakh	
6	Cost of supply of free fuel wood to workers residing in or near forest area during the period of construction. Construction period - 5 years Number of labours at peak time - 800 Per head cost of fuel – Rs.20.00 per day Total cost = Rs.292.00 lakh	
	Total = Rs. 117098.58 lakh	Total = Rs. 260463.50 lakh

$$\text{Cost Benefit Ratio} = \frac{\text{Benefit}}{\text{Loss}} = \frac{260463.50}{117098.58} = 2.22$$


JGM/Project
RVNL, Chandigarh


Chief Project Manager
RVNL, CHANDIGARH