

### COST BENEFIT ANALYSIS

**Name of the Project:** Strengthening and Rehabilitation of Vallabhipur (km 0+900) to Ranghola (km 27+532), SH 39 in Bhavnagar District of Gujarat State by Roads & Building Department, Government of Gujarat through World Bank Assistance.

- Total length of the road along the PF= **26. 732 km**
- Total Forest area proposed for diversion= **31.692 ha**

**Table - A Estimation of cost of forest diversion**  
(As per Resolution No. 7-69/2011-FC (Pt.), 01-08-2017)

S. No.	Parameters	Remarks
1	Ecosystem Services losses due to proposed forest diversion	Economic value of loss of eco-system services due to diversion of forests is estimated based on NPV for protected forest falling within the proposed right of way (PRoW). For NPV; Eco- Class- IV Tropical Thorn Forests having dense forest land 40 % to 70 % density (per ha.) is considered. Hence, NPV for Bhavnagar District: 563000 x 31.692 (Demanded Forest area in ha.) = 1,78,42,596 Total cost of NPV = INR Rs. 1,78,42,596=00 (source : <a href="https://forests.gujarat.gov.in/forest-conservation-act.htm">https://forests.gujarat.gov.in/forest-conservation-act.htm</a> & F. No. 5-3/2007 –FC dated 05.02.2009)
2	Loss of animal husbandry productivity, including loss of fodder	Quantified in NPV Value suggested by Central Empowered Committee and is included in the NPV as mentioned above. The forest area along the proposed alignment is already fall under protected forest category and hence there will not be any impact on agriculture and animal husbandry.
3	Cost of human resettlement	No resettlement in the forest land that are diverted for the project.
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.	There is no loss of public facilities and administrative infrastructure on forest land for this project. Public facilities within the proposed RoW impacted due to proposed widening will be shifted. But no forest land will be required for the shifting of these facilities.
5	Possession value of forest land diverted	30% of environmental cost (NPV) due to loss of forests or circle rate of adjoining area in the district is added as a cost component as possession value of forest land; INR Rs. 53,52,778.80
6	Cost of Suffering to oustees	Nil
7	Habitat Fragmentation cost	No habitat will be affected due to the widening of existing road. Impact on microclimate due to tree cutting along the proposed alignment will be compensated with avenue plantation (as suggested by the forest department). Hence the



S. No.	Parameters	Remarks
		project is expected to have only minor impact on environment.
8	Compensatory afforestation and soil & moisture conservation cost	Slope protection measures are included in the design of highways. Further turfing and pitching will be done for stabilising embankments there by avoiding soil erosion. Provision of natural drain along the highway shall be maintained the moisture in the soil.

Current Environmental Net Loss in INR = Rs. 1, 78, 42,596.00 + 53, 52,778.80 =  
Rs. 2, 31, 95,374.80

**Table B:** Existing Guidelines for estimating benefits of forest –diversion in CBA  
(As per Resolution No. 7-69/2011-FC (Pt.), 01-08-2017)

Sl. No.	Parameters	Roads; Tr. Lines & Railway Lines
1	Increase in productivity attributable to the specific project	In lieu of total trees to be affected in forest land it is proposed to be undertake at least twice of the affected trees as compensatory afforestation as per Forest (Conservation) Act. So the net productivity will increase. Apart from compensatory plantation. The compensatory afforestation will be taken up in about 63.384 ha of Degraded Forest land which is about two times of the area proposed to be diverted.
		The monetary benefits due to highway will total to Rs. 50 Crores in design life of 15 years due to reduction in travel time, vehicle operating cost, fuel consumption, accident risks, congestion, increased economic growth along the project influenced areas, reduced environmental pollution etc.
2	Benefits of economy due to the specific project	Highway development will trigger economic development in the project influence area with opportunities for new commercial and industrial establishments. Better connectivity with reduced travel time and better road geometrics will result in saving in travel time, fuel, and health improvements due to smoother road and congestion reduction which will add to economic growth of the state as a whole.
3	No. of population benefited	Since the project road is having state importance and is a notified State Highway, the direct beneficiaries will include state commuters and locals and entire population of the project districts will be benefited.
4	Employment potential	The project will give direct employment for approximately 150 - 200 people during construction period. Multi fold employment opportunities are anticipated during operational phase since better connectivity attracts investments in commercial and industrial sectors.
5	Cost of acquisition of facility on non-forest land wherever	The proposed project aims to strengthening and widening of existing road. The existing alignment traverses the forest



Sl. No.	Parameters	Roads; Tr. Lines & Railway Lines
	feasible	area with no options for alternatives analysis. Hence diversion of forest land for the proposed widening purposes is unavoidable.
6	Loss of (a) agricultural & (b) animal husbandry production due to diversion of forest land	The forest area along the proposed alignment is already fall under protected forest category and hence there will not be any impact on agriculture and animal husbandry
7	Cost of rehabilitating the displaced person as different from compensatory amount given for displacement	There are no human settlements along the proposed alignment within forest areas and hence there will not be any displacement of people from forest areas along the project road for proposed highway development.
8	Cost of supply of free fuel wood to workers residing in or near forest area during the period of construction	The construction labours will be provided with labour camps and no labour camps will be located within forest areas. The labour camps will be provided with LPG / eco-friendly fuel facilities and hence there will not be any tree cutting for fuel wood.

Therefore Net Project Benefit in INR = INR 50 crores

Therefore cost benefit ratio = Total Benefit / Total cost of the project

50, 00, 00,000.00 / 2, 31, 95,374.80= 21.556



**Executive Engineer**

**Project Implementation Unit (WB Projects)**

**Roads and Building Department**

**Govt. of Gujarat**

**Place: Gandhinagar, Gujarat**

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