

## Attachment - 3

## COST BENEFIT ANALYSIS

Name of Project-Rehabilitation and Up-gradation of Wadi To Asola Junction National Highway (NH-353I) from [Design km.00.000 to km. 39+200] to Two lane with paved shoulders in the state of Maharashtra on Engineering, Procurement & Construction (EPC) Basis Contract (Package-1),

## COST BENEFIT ANALYSIS FOR DIVERSION OF FOREST LAND

Sl. No.	Parameters	Cost Analysis
1	Loss of value of timber, fuel wood and minor forest produce on an annual basis, including loss of man-ours per annum of people who derived livelihood & wages from the harvest of these commodities	Considering, Fuel Wood @ 1t/hect. and Rs 300/- per yr/tonne so for 8.89 hect. will be Rs 2667/ per year. Therefore for 50 years it will be Rs 2667 x 50= Rs 133350/-. No loss of man hours as local community is not dependent for livelihood on this land.  No livelihood of people is likely to be affected due to Proposed diversion of forest land as no one community residing nearby are dependent on forest/forest produce.
2	Loss of animal husbandry productivity, including loss of fodder	Loss of animal husbandry due to proposed diversion is very moderate and calculated below; Gross loss @ 5 t/Ha. year. @ Rs. 100/- per tonne. Therefore, loss of fodder as estimated for about 8.89 hect. will be 8.89 x 5 x 100 = Rs 4445/yr. X 50 years = Rs.222250/-
3	Cost of human resettlement	There is no displacement of people in forest area identified and considered due to diversion.
4	Loss of public facilities and administrative infrastructure (Roads, buildings, schools, dispensaries, electric lines, railway etc) on forest land, or which would require forest land if these facilities were diverted due to the project.	There is no such infrastructure loss. The existing road facility which traverse through forest area will be widened.
5	Environmental losses: (Soil erosion, effect on Hydrological cycle, wildlife habitat, Mmicroclimate upsetting of ecological balance).	Forests land being diverted for the widening of the project is 8.89 hectare. (As per Forest (Conservation Act 1980 the environmental loss for fully stocked having density 1.0 is 126.74 lakhs per hectare for 50 years.)

		<p>Considering overall forest average density is 0.4, the cost of environmental losses is Rs 762.9 lakhs</p> <p>Density of forest area (average) = 0.4.</p> <p>Value per hectare= Rs. 50.696 Lakhs for forest density 0.4.</p> <p>Forest land =8.89 hectare</p> <p>Environmental value = 50.696 x 8.89 Rs. = 450.68 Lakhs</p>
6	Suffering to oustees	NIL, No one is ousted from the area as no one stay in the area where forest land diversion is proposed.

### BENEFIT ANALYSIS

Sl.No	Parameters	Cost Analysis
1	Increase in productivity attributable to the specific project.	Due to Up gradation of the existing highway, there will be overall development of the project area in terms of transportation of agriculture produces, easy access to education, health marked etc. The project road also connect MIDC, so transportation of manufactured goods will be cheaper and easy. Smooth transportation will accelerate growth and establishment of food processing unit along the highway and accordingly it will enhance agriculture production in the region.
2	Benefits to economy	<p>Improved access to, MIDC , tourist places, higher education facilities &amp; modern health facilities. Strengthening of both rural &amp; urban economies which in turn will improve economic scenario of the state and country.</p> <p>Improved road connectivity helps in better implementation and management of government schemes. It will not only provide fast and economical transport of goods train. 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. Exact quantification of the value is not possible as it is time and policy dependent.</p>
3	No. of population benefited	The proposed National Highway (NH 353 I) connects two National Highways i.e. NH 53 Hawarah – Raipur - Nagpur to Mumbai / Gujrat & NH 361 Nagpur –Tuljapur National Highway. This NH is a link for connectivity of developments around Nagpur town as it connects Hingna & Butibori MIDC. Further proposed NH situated adjacent to

Sl.No	Parameters	Cost Analysis
		<p>MIHAN (Multi Model Cargo Hub) at Nagpur. There are existing Reliance &amp; Mondha Power Plants nearby the project road. The project road also connects Education Hub at Issasani as Medical &amp; Engineering colleges are within the vicinity of the project road.</p> <p>The project road is located in district Nagpur so the entire population of this districts i.e 2.406 million. These populations are directly benefited in addition to thousands of travellers and freight.</p>
4	Employment potential	Direct employment to 250-300 for 2-year (accordingly 182500 Man days) people and substantial indirect employment as a result of development of infrastructure and will also provide direct benefit to industrial units in the area.
5	Cost of acquisition of facility on non-forest land wherever feasible	Non-Forest Land (about 30.83 hectare) will be acquired as per the NH act/ Land acquisition Act 2013.The compensation will be paid as per LARR Act, 2013.
6	Loss of (a) agricultural & (b) animal husbandry production due to diversion of forest land	<p>(a) about 30.83 hectare of non-forest land is to be acquired, these lands are predominantly None-agricultural land.</p> <p>(b) Loss of animal husbandry due to proposed diversion is very minimum and calculated below;</p> <p>Gross loss @ 5 t/Ha. year. @ Rs. 100/- per tonne. Therefore, loss of fodder as estimated for about 8.89 hect. will be <math>8.89 \times 5 \times 100 =</math> Rs 4445/yr. X 50 years = Rs.222250/-</p>
7	Cost of rehabilitating the displaced persons as different from compensatory amounts given for displacement	Not Applicable
8	Cost of supply of free fuel wood to workers residing in or near forest area during the period of construction	<p>Basic living amenities including alternative fuel (LPG, Solar Cooker etc) will be supplied to labours/workers.</p> <p>Construction period- 2 years</p> <p>Number of labours at peak time – 300</p> <p>More than 50% labour assume to be local</p> <p>Per head cost of fuel –Rs.20/ per day for rest 150 labours</p> <p>Total cost= Rs 20x150 labours x 730 days= Rs 2190000/-</p>

Summary of Cost-Benefit Analysis for the Project.

Sl. No.	Loss (in Lakhs)	Benefit (in Lakhs)
1	Environmental Loss Rs. 450.68 Lakh	182500 man days will be generated for unskilled/semi-skilled worker in terms of Salary and Wages @ Rs 500/day = Rs 912.5/-
2	Fuel Wood  Fuel Wood @ 1t/hect. and Rs 300/- per yr/tonne so for 8.89 hect. will be Rs 2667/ per year. Therefore for 50 years it will be Rs 2667 x 50= Rs 133350/- or 1.33 lakh	Basic living amenities including alternative fuel (LPG, Solar Cooker etc) will be supplied to labours/workers. Construction period- 2 years Number of labours at peak time – 300 More than 50% labour assume to be local Per head cost of fuel –Rs.20/ per day for rest 150 labours Total cost= Rs 20x150 labours x 730 days= Rs 2190000/- or Rs 2.19 lakhs
3	Loss of animal husbandry productivity, including loss of fodder  As estimated for about 8.89 hect. will be 8.89 x 5 x 100 = Rs 4445/-yr. X 50 years = Rs.222250/- or 2.22 lakh	Total Benefit in terms of employment during construction = Rs 91250000/- +2190000/- for 2 years= 93440000 Hence benefit per annum= Rs 46720000. or 467.2 lakhs
4	Total Rs 450.68 + 1.33+2.22=454.23 lakh for 50 years. Hence loss per annum= 454.23/ 50 Years = Rs 9.08 Lakhs	


*Note - As the project is proposed to be developed under EPC mode thus financial model have not been carried out for the project road. For general estimation purpose cost benefit analysis, has been done for initial 2 year of construction period.*

Cost Benefit Ratio (per annum for initial 2 year)

$$\frac{\text{Benefit}}{\text{Loss}} = \frac{467.2}{9.08} = 51.4$$

Date

Place: -

  
Executive Engineer  
National Highway Division  
Nagpur, Maharashtra

Signature & Seal  
Executive Engineer  
National Highway Division  
Nagpur