



GOVERNMENT OF ARUNACHAL PRADESH
PUBLIC WORKS DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER
PAKKE KESSANG DIVISION: PWD
AP: CAMP: NAHARLAGUN

Email id: eepkdpwd@gmail.com

COST BENEFIT ANALYSIS FOR FOREST LAND DIVERSION

(Ref: MoEF guideline No. 7-69/2011-fc(Pt.) Dtd. 01st Aug'2017)

Project:- Proposal for diversion of 30.99 Ha of forest land for improvement/up-gradation of Pakke-Seijosa-Itakhola road (62km) in East Kameng Dist. Of Arunachal Pradesh by PWD, Arunachal Pradesh.

Table-A:- Case under which a cost-benefit analysis for forest diversion are required

Sl.No.	Nature of Proposal	Applicable/Not applicable	Remarks
1	All categories of proposal involving forest land upto 20 hectares in plains and upto 5 hectares in hills	Not applicable	
2	Proposal for defence installation purpose and oil prospecting (Prospecting only)	Not applicable	
3	Habitation, establishment of industrial units, tourist lodge complex and other building construction.	Not applicable	
4	All other proposals involving forest land more than 20 hectares in plains and more than 5 hectares in hills including roads, distribution lines, minor, medium and major irrigation projects, hydro projects, mining activity, railway lines, location specific installation centres, TV Towers etc.	Applicable	These are case where a cost benefit analysis is necessary to determine when diverting the forest land to non-forest use in the overall public interest.



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Table-B:- Estimation of Cost of Forest Diversion.

Sl.No.	Parameter	Remarks	Monetary equivalent
1	Ecosystem services losses 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). <i>Note:-</i> 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.	NPV for the diverted forest area considered as Rs. 9.39 Lakhs/Ha Total value of NPV in Rs. = (9.39 LakhsX30.99HaX0.40) = 116.40 Lakhs.
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.116.40 Lakhs = Rs.11.64 lakhs.
3	Cost of Human resettlement	To be quantified and expressed in monetary terms as per approved R&R plan	Nil. There is no human resettlement issues in this project, hence no cost involved for any R&R schemes.
4	Loss of public facilities and administrative infrastructure (Roads, building, schools, dispensaries, electric lines, railways, etc) on forest land, which would require forest land if these facilities were diverted due to the project.	To be quantified and expressed in monetary terms as per approved R&R plan	Nil. There is no requirement of any diversion of public facilities and administrative infrastructure (Roads, building, schools, dispensaries, electric lines, railways, etc) under this Road project.



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Sl.No.	Parameter	Remarks	Monetary equivalent
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 forest land whichever is maximum.	30% of Rs.116.40 Lakhs (NPV) = Rs.34.92 lakhs.
6	Cost of suffering to oustees	The social cost of rehabilitation of oustees (in additional 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.	Not applicable for this project since there is no resettlement involved.
7	Habitat Fragmentation Cost.	While the relationship between fragmentation and forest goods and services is complex, for the sake of due to fragmentation has been pegged at 50% of NPV applicable as a thumb rule	Considered as 50% of NPV i.e Rs.58.20 Lakhs.
8	Compensatory Afforestation and soil and moisture conservation cost.	The actual cost of compensatory afforestation and soil & moisture conservation and its maintenance in future at present discounted value.	Cost of CA is considered as = Rs.3.50 Lakh per Ha. Total CA Cost (in double degraded land) = (3.50 X 30.99Ha X 2) = Rs.216.93 Lakhs.
		Total Cost of Forest Diversion	=Rs.(116.40+11.64 +34.92+58.20) =Rs. 221.16 Lakhs. =Rs.2,21,16,000.00 =Rs. 2.1226 Crores.



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

Sl.No.	Parameter	Remarks	Monetary equivalent
1	Increase in productivity attribute to the specific project	To be quantified & expressed in monetary terms avoiding double counting.	<p>This road is sponsored by the North East Council. The NEC has directed to improve the existing Pakke – Seijosa - Itakhola Road to MDR Standard Specification to give proper connectivity from Assam and Arunachal Pradesh and to give connectivity between two Administrative Head Quarters such as Pakke Kessang and Seijosa.</p> <p>This road act as defence Alternate Road Communication which is one of the important road to connect and reach from Tezpur Military Zone to China Border via Pakke Kessang to Seppa at short spans of time. This road will directly going to enhance the productivity and development of the society and economic upliftment.</p> <p>The lump sum monetary equivalent of the benefits is considered as 50 lakhs.</p>
2	Benefits economy due to the specific project.	The incremental economic benefits in monetary terms due to the activities attributed to the specific project	<p>The construction of this road will facilitate economic growth of the area by means of transportation and enhance the productivity and development of the society and economic upliftment in eco-tourism sector. The road will facilitate easy acces to big markets for local fruits like oranges and rice as foodgrain. It will fetch better value to local tribes dependent agriculture/horticulture.</p> <p>The lump sum monetary equivalent of the benefits is considered as 150 lakhs.</p>
3	Numbers of Population benefited due to specific project	As per the Detailed project report.	<p>The construction of this road is going to benefit entire population of the region as well as benefitted as an important Inter-State road in between Arunachal Pradesh and Assam. And this road act as defence Alternate Road Communication which is one of the important road to connect and reach from Tezpur Military Zone to China Border via Pakke Kessang to Seppa. The lump sum monetary equivalent of the benefits is considered as 150 lakhs.</p>



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Sl.No.	Parameter	Remarks	Monetary equivalent
4	Economic benefits due to direct and indirect employment due to the project	As per the Detailed project report.	The construction of this road will facilitate economic growth of the area by means of transportation and enhance the productivity and development of the society and economic upliftment in tourism sector. The lump sum monetary equivalent is of the direct and indirect employment generation is calculated as 120 lakhs.
5	Benefits economy due to Compensatory afforestation	Benefits from such compensatory afforestation accruing over next 50 years monetized 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.	Benefits from compensatory afforestation accruing over next 50 years is huge and monetary equivalent is considered as Rs. 150 Lakhs
Total benefits of the project (monetary equivalent)			=Rs.(15000000+15000000+15000000+12000000+15000000) =Rs.7,20,00,000.00 =Rs. 7.20 Crores

$$\begin{aligned}
 \text{Cost Benefits Ratio (CBA Ratio)} &= \frac{\text{BENEFIT}}{\text{COST}} \\
 &= \frac{7.20}{2.1226} \\
 &= 3.392
 \end{aligned}$$

Executive Engineer
Pakke Kessang Division, PWD
Pakke Kessang Division
APPWD : Pakke Kessang