

GOVERNMENT OF ARUNACHAL PRADESH
OFFICE OF
THE EXECUTIVE ENGINEER (E)
PASIGHAT TRANSMISSION DIVISION NO-III
DEPARTMENT OF POWER,
ARUNACHAL PRADESH ELECTRICAL CIRCLE-II PREMISES,
OPPOSITE AIRPORT, PASIGHAT, PIN- 791102

E-mail: exenptd.psg@gmail.com

No. PTD/WS-21/2021-22/ 670

Dated: 07/10/2021

COST BENEFIT ANALYSIS FOR FOREST LAND DIVERSION

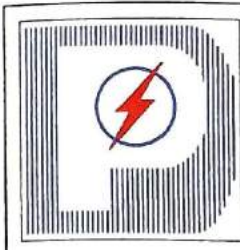
(Ref: MoEF guideline No. 7-69/2011-FC(Pt.) dtd. 01st Aug, 2017)

Project: Diversion of **95.40 Ha.** of Forest Land for 132 KV ALONG TO KAMBANG TL S/C LINE ON D/C TOWER in the state of Arunachal Pradesh under the "Comprehensive Scheme of Arunachal Pradesh".

Table - A: - Cases under which a cost benefit analysis for forest diversion is required

No.	Nature of Proposal	Applicable/Not Applicable	Remarks
1	All categories of proposal involving forest land upto 20 hectares in planes 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 proposal involving forest land more than 20 hectares in planes and up to 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 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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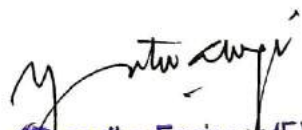


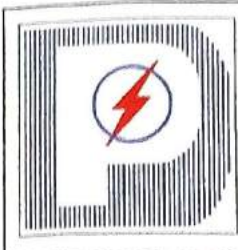
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Table - B: - Estimation of cost of Forest Diversion

Sl. No.	Parameter	Remarks	Monetary Equivalent
1	Ecosystem services losses due to proposed forest diversion	<p>Economic value of loss of eco-system services due to diversion of forests shall be the net present value (NPV) of the forest land being diverted as prescribed by the Central Government (MoEF & CC)</p> <p><i>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.</i></p>	<p>NPV for the diverted forest area is considered as Rs. 9.39 Lakhs/Ha.</p> <p>Total value of NPV in Rs. = (9.39 lakhs x 95.40 Ha.) = 895.81 Lakh</p>
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.	<p>NIL.</p> <p>As the proposed project is an overhead transmission line, there will be no loss of animal husbandry productivity, including loss of fodder. After completion of tower erection and stringing, natural vegetation/plantation of dwarf species will cover up the area which were temporarily damaged during construction.</p>
3	Cost of Human Resettlement	To be qualified and expressed in monetary terms as per approved R&R plans.	<p>NIL.</p> <p>There is no human settlement issue in this project. Hence no cost involved for any R&R scheme.</p>

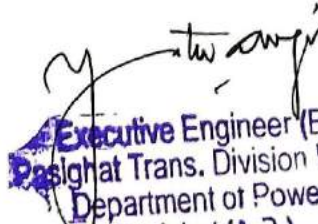

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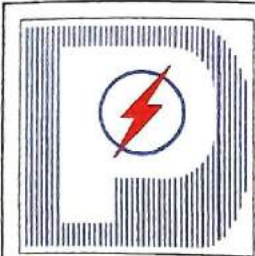


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4	Loss of public facilities and administrative infrastructure (Roads, building, schools, dispensaries, electric lines, railways etc.) on forest land, which would require forest land if these facilities were diverted due to the project	To be quantified and expressed in monetary terms on actual cost basis at the time of diversion	NIL. There is no requirement of any diversion of public facilities and administrative infrastructure (Roads, building, schools, dispensaries, electric lines, railways etc.) under this transmission project.
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	The possession value of forest land diverted is calculated as 30% of NPV which is Rs. 268.74 lakhs. However, in case of transmission line projects, possession of diverted forest land is not completely required by the User Agency after completion of the project & during operation & maintenance (O&M) stage. As per existing MoEF guideline, dwarf species plantation will be undertaken below the transmission line corridor (RoW) by Forest Department. only looping & pruning of tree branches near the electric corridor will be required during the maintenance period of the project.
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.	Not applicable for this project since there is no resettlement involved.


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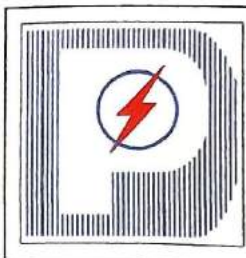


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7	Habitat Fragmentation Cost	While the relationship between fragmentation & forest goods & services is complex, for the sake of simplicity the cost due to fragmentation has been pegged at 50% of NPV applicable as a thumb rule.	Considered as 50% of the NPV i.e., Rs. 447.90 Lakhs
8	Compensatory afforestation and soil and moisture conservation cost	The actual cost of compensatory afforestation and soil and moisture conservation and its maintenance in future at present discounted value.	Cost of CA is considered as = 3.5 lakh per Ha. Total CA cost = $(3.5 \times 95.40 \text{ HA} \times 2) = 667.80$ lakh
Total cost of Forest Diversion=			$(895.81+268.74+447.90+667.80)$ lakh = 2280.25 Lacs

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

Sl. No.	Parameters	Remarks	Monetary Equivalent
1	Increase in productivity attribute to the specific project	To be quantified & expressed in monetary terms avoiding double counting.	<p>Socio economy development & industrial growth, power for irrigation, telecommunication facility & distribution of grid power to rural households will have major to the socio-economy of the state.</p> <p>The lump sum monetary equivalent of the above benefit is considered as Rs. 50 Lakhs.</p>
2	Benefits to economy due to the specific project	The incremental economic benefit in monetary terms due to the activities attributed to the specific project.	<p>The monetary return of the specific transmission project is calculated as below:</p> <p>Capacity of the line loading = 50000 KW Cost of Power (assume an average value) = Rs. 3.90 per KWH Monetary return of the project for Fifty (50) years = $(50000 \times 24 \times 30 \times 12 \times 50 \times 3.9)$ = Rs. 842400 lakhs</p>
3	No. of population benefited due to specific project	As per the Detailed project report	<p>Entire population of Along and also the surrounding areas will be benefitted by the said 132 KV S/C (On D/C tower) Transmission line from Along to Kambang. The said line connectivity will help the rapidly developing Pasighat area by providing uninterrupted power supply for small- & large-scale business establishments which will improve the socio-economy development of the area.</p> <p>The lump sum monetary equivalent of the above benefit is considered as Rs. 50 Lakhs.</p>

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4	Economic benefits due to direct and indirect employment due to the project	As per the Detailed project report	Temporary labour engagement (<i>approx. 60 nos. per day</i>) during execution of the project along with various firms / suppliers / manufacturers will be engaged for a period of Four (4) years. Permanent employment for Fifteen (15) nos. will also be generated. the lump sum monetary equivalent of the direct & indirect employment generation is calculated as Rs. 450 lakhs.
5	Economic benefits due to Compensatory afforestation	Benefits from such compensatory forestation accruing over next Fifty (50) years monetised & 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 forestation accruing over next Fifty (50) years is huge and monetary equivalent is considered as Rs. 50 lakhs.
Total benefit of the project (monetary equivalent)			= (50 + 842400 + 50 + 450 + 50) lakh = 843000 Lakh

$$\text{Cost Benefit Ratio (CBA Ratio)} = \frac{\text{BENEFIT}}{\text{COST}}$$

$$= \frac{843000 \text{ Lakhs}}{2280.25 \text{ lakhs}}$$

$$= 369.69/1$$

$$(\text{CBA Ratio}) = 369.69/1$$

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 Pasighat Transmission Division-III,
 Dept. of Power, Pasighat
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 Department of Power
 Pasighat (A.P.)