


Full Title of the Project: - Construction of 11KV HT Line to the Un-electrified Village. Shagore, Shakti, & Maror in Banjar Block Distt.Kullu. (H.P.)

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

Sr. No	PARAMETERS	Applicable/not applicable	Remarks
1	All categories of proposals involving forest land up to 20 ha. In plains and up to 5 ha. In hills.	Not applicable	These proposals may be considered on a case to case bases and value judgment.
2	Proposal for defence installation purposes and oil prospecting (Prospecting only)	Not applicable	In view of national priority accorded to these sectors, the proposals would be critically assessed to help ascertain that the utmost minimum forest ids diverted for non-forest use
3	Habitation establishment of industrial units, tourists	Not applicable	These activates being detrimental to protection and lodges complex and other building constructions conservation of forest, as a matter of policy, such proposals would be rarely entertained.
4	All other proposals involving forest land more than Applicable 20 ha. In plans and more than 5 ha. In hills including roads, transmission lines, minor, medium and major projects, hydro projects, mining activates, railway lines, location specific installations like microwave stations, auto repeater centers, TV towers etc.	Not applicable	These are cases where a cost- benefits analysis in necessary to determine when diverting the forest land to non-forest use in the overall public interest.

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Place: - Thalout

  
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Table-B- Estimation of cost loss of forest diversion

Sr. No.	PARAMETERS	Total losses for 50 years (Rs. in crore)	Remarks
1	Ecosystem services losses due to proposed forest diversion.	437.798	(Annexure attached)
2	Loss of animal husbandry productivity i/c loss of fodder	0.00248	(Annexure attached)
3	cost of human resettlement	Nil	Not applicable
4	Loss of public facilities and administrative infrastructure (Roads, building, School, Dispensaries, electric lines, railways etc.) on forest land of these facilities were diverted due to the projects.	Nil	Not applicable
5	Possession value of forest land diverted.	131.339	(Annexure attached)
6	Cost of suffering to oustees	Nil	Not applicable
7	Habitat Fragmentation Cost.	218.899	(Annexure attached)
8	Compensatory Afforestation and soil & moisture conservation cost.		The user agency is committed to pay the actual cost of compensatory afforestation and soil & moisture conservation and its maintenance in the future at present discounted value whose cost is included in the project DPR.
<b>Total Losses (in Crore) = 788.038</b>			

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Table-B- Estimation of cost of forest diversion

**Parameter No.1: Ecosystem losses due to the proposed forest diversion**

Total NPV cost = 8.1872 Ha. X 1069470X50 year

NPV cost of GHNP = 10 X 8.1872 Ha. X1069470X50 year

Forest losses due to parameter no. 1 = Rs. 437.798 Crore

**Parameter No.2: Loss of animal husbandry productivity i.e. loss of fodder**

Approximately one Ha area if deforested, the cattle in this area will be deprived of the grazing land and it will create pressure on the adjacent area. The loss towards the grazing cost will be app. Rs. 100/- per year for about 2 cattle only for area measuring ( 2 mtrsX 2 mtrs x 248 towers) 248 towers foundation in forest land as other area will remain undisturbed since wires will go overhead at a distance of 7 mtrs from ground level.

Thus loss due to grazing land Rs.100 X 248 Tower locations = Rs.0.00248 cr. / year or Rs. 24800.00/ year

**Parameter No.5: Possession value of forest land diverted**


Possession value of forest land diverted is 30% of the NPV value which is equal to = 30% X 437.798 crore = 131.339 crore

**Parameter No.7: Habitat Fragmentation cost**

Habitat Fragmentation cost of forest land diverted is 50% of the NPV value which is = 50% X 286.143 crore = 218.899 crore

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

Sr. No.	PARAMETERS	Monetary benefits for 50 years In (Rs. In Crores)
1	Increase in productivity attribute to the specific project (Annexure attached)	2.07
2	Benefits to economy due to the specific project (Annexure attached)	4.91
3	No. of population benefited due to specific project (Annexure attached)	405 cr
4	Economic benefits due to of direct and indirect employment due to the project	Direct benefits - 5816 Crore Indirect benefits - 1459.8 Crore
5	Economic benefits due to compensatory afforestation (Annexure attached)	The user agency is committed to pay the actual cost of compensatory afforestation and soil & moisture conservation and its maintenance in the future at present discounted value whose cost is included in the project DPR.
	<b>Total (in crore)</b>	<b>7687.78 Crore</b>

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

Sr. No.	Parameters 1 (to be quantified) Increase in productivity attribute to the specific project		
1.1	Average Consumption of power by one consumer	250 Units	
1.2	No. of house hold to electrified	46 Nos	
1.3	Average Energy consumption in one year	$250*46*12 = 1,38,000$	
1.4	Average Rate of Power tariff	Rs. 3.00 Per Unit.	
1.5	Total tariff for energy per year (In crore)	$138000*3 = 414000$	0.0414 Crore
1.6	Total tariff for energy transfer for 50 year (In Crore)	$0.0414 \text{ Crore} * 50\text{years}$	2.07 Crore


2	Parameters 2 (value Judgment)		
2.1	Benefit to economy due to the specific project		
	Increase in irrigation area		
i	Energy Consumed	138000 units	
ii	Energy. utilized for irrigation purpose.	$30\% * 138000 \text{ Units} = 41400$	
iii	Unit consumed / ha. by 10hp (7.46Kw) pump / annum	$7.46 \text{ KW} * 6\text{hrs} * 365 \text{ days} = 16337.4 \text{ kWh/yr}$	
iv	Total area anticipation to be irrigated.	1.76 ha.	
v	Monetary benefit for irrigation per ha. Per annum due to saving in labor cost due to availability of electricity (2 labour / month / ha. @ 300/ day.	219000/ha. yr	
vi	Monetary benefit for irrigation per ha. Per annum due to saving in labor cost due to availability benefit for 6090 ha.	$219000 * 1.76 \text{ ha}$	0.038 Crore
2.2	Increase by food production (value Judgment).		
i	Increase in food production per ha. Per year 3 ton approx	3 ton	
ii	Therefore increase in food production in 6090 ha.	$3 * 1.76 \text{ ha} = 5.28 \text{ ton}$	
iii	Minimum cost of produced food /ton i/c carriage to market	Rs. 5000/- Ton	
iv	Total cost increase in food production	$5000 * 5.28$	0.0026 Crore
2.3	Benefit to new industries (Value judgment)		
2.3.1	Industrial share of Energy 58% of 96000 kWh	$138000 * 58\% = 80040$	
i	Benefit to existing industries due to this power @ Rs 6/- per unit of energy supplied for per annum	$80040 * 6$	0.048 Crore
2.3.2	Share for new industries 20%	$20\% * 80040 = 16008$	
	Benefit to new industries due to this power @Rs. 6/- per unit of energy supplied for per annum	$16008 * 6$	0.0096 Crore

  
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Total Benefit per year	0.038+0.0026+0.048+0.0096	0.0982 Crore
Total Benefit for 50 year	0.0982 Crore * 50 Years	4.91 Crore

3	Parameters 3 (Value Judgment)		
	Population benefit (HP Population 2011)	0.68 Crore (Population)	
	Population based benefit due to specific project		
i	Increase in population till date approx. 20%	0.13 Crore	
ii	Total population directly benefited	0.81 Crore	
iii	Additional families benefited (Considering 6 members in family)	0.81/6= 0.0135 Cr Families	
iv	Per year Total Benefit to additional families @600/-	0.135*600=8.1	8.1 cr
v	Benefits for 50 year	8.1 cr x 50 year	405 cr

4	Parameters 4 (Value Judgment)		
	Economic benefit due to of direct and in-direct employment due to the project		
4.1	Indirect ( during construction )		
i	15 Nos. i.e. shpos, local work shop etc. @	30000/month	
ii	Indirect benefit	30000*12	0.036 Crore
4.2	Direct ( during construction )		
i	Daily approx. 150 man for 18 months during construction	81000 per- day	
ii	Benefit for employment @ 300/ man / day X 81000 Man days	81000*300	2.43 Crore
4.3	Indirect (agriculture sector)		
i	Out of population of 0.081 crore the labour required per day in Agriculture sector (Appox.1%)	0.081 lakh	
ii	Total Man - days involved in agriculture sector 0.068 lakh X 120 working days/yr	9.72 lakh man - days	
iii	Benefit for employment in agriculture sector @ Rs. 300/man - day	300%*9.72 lakh	29.16 Crore
4.4	Direct (Industrial sector)		
i	Out of population of 0.081 crore the labour requirement generated in industrial sector per day is 5200 man days Appox.		
ii	Total mandays generated in industrial sector per year is 5200 X 365 man - days	18.98 lakh man-days	
iii	Benefit for employment in Industrial sector @ Rs. 600/ man-day X 0.1898 lakh	600*0.1898 lakh man-days	113.88 Crore
	Total direct benefits for 50 years	116.31 Crore * 50 years	5816 Crore
	Total Indirect benefits for 50 years	29.196 Crore * 50 years	1459.8 Crore

  
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Total forest area applied for diversion: 8.1872

Total benefit of the projects for 50 years

Parameters 1	2.07
Parameters 2	4.91
Parameters 3	Nil
Parameters 4	7275.8

**Total Benefit for 50 years 7282.78 Crore**

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Total loss of forest for 50 years

Parameters 1	437.798
Parameters 2	0.00248
Parameters 3	Nil
Parameters 4	Nil
Parameters 5	131.339
Parameters 6	Nil
Parameters 7	218.899
Parameters 8	Nil

**Total Loss for 50 years 788.02 Crore**

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Benefit per ha. from the project = Total benefits from the project / total area of the project  $7282.78 / 8.1872 = 889.53$  Crore / ha.


Loss per ha. of forest land = Total loss from the forest land / total area of forest land =  $788.02 / 8.1872 = 96.25$  Crore /ha.

The area out of above mentioned area can be used for all sorts of paddy fodder and other cultivation activities in private land. The forest area of 8.1872 ha. will regenerate natural fodder growth as forest land will not be unreported for laying overhead line except for tower foundation (2mtr X 2mtr) for 248 No. tower.

Therefore benefit to loss ratio = (benefit per ha. of the project) / (loss per ha. of the project) =  $889.53/96.25 = 9.24$  Crore / ha.

The project shows benefit to loss ratio 9.24 : 1

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