

कंडिका क्रमांक -13

छत्तीसगढ़ राज्य विद्युत पारेषण कम्पनी मर्यादित द्वारा
132 के.व्ही. डी.सी.एस.एस. बारसूर - बीजापुर विद्युत पारेषण लाईन परियोजना

कास्ट / वेनिफिट एनालिसिस

संलग्न है।



(प्रवीण प्रकाश सिंह)
कार्यपालन अभियन्ता

अति उच्च दाब (संधारण) संभाग
छ.रा. वि. पारे. क. मर्यादित, भिलाई (छ.ग.)



(के.आर. बड़ाई)
भा.व.से.

वनमंडलाधिकारी
दन्तेवाड़ा वनमण्डल,
दन्तेवाड़ा (छ.ग.)

APPENDIX-1
CALCULATION OF LOSS OF FORESTIS

Project:- Construction of 132 KV DCSS Barsoor- Bijapur Transmission line.

- Total area of forest in Hactare for diversion:-

Sr. No	Forest Division	Reserve Forest	Protected Forest	Orange area	Revenue forest	Total
1	Dantewada	24.601	24.141	-	22.963	71.705

(A) : Evaluation of loss of timber, fuel, M.F.P., Mandays

- a. **Loss of timber & fuel as per tree enumeration calculation at page no:-**

Items	Forest Renge Geedam	Forest Renge Nelasnar	Total
a. Estimated Timber loss as per enumeration list	526.431 Cum.	299.467 Cum	825.898 Cum.
b. Estimated fuel loss as per enumeration list	561 Chatta x 0.66 (370.26 Cum.)	277 Chatta x 0.66 (182.82 Cum.)	838 Chatta x 0.66 (553.08 Cum.)
c. Estimated total timber & fuel loss as per enumeration list	896.691 Cum	482.287 Cum.	1378.978 Cum.
d. Total timber & fuel loss as per enumeration list in Rs. Page no.	Rs.682313.00	Rs.345258.00	1027571.00

- b. **Loss of minor forest produce (M.F.P.)**

Items	Forest Division Dantewada
a. Area of forest in Hectare for diversion	71.705 Ha.
b. Total annual income from MFP in the Division.	Rs. 3,62,16,214.00
c. Total forest area of Division in Hectare	171068.50 Ha.
d. Average annual revenue per Hectare from M.F.P.	Rs 212.00 /Ha.
e. Value of M.F.P. loss = Average annual revenue per Hectare x Area of diverted forest	=212.00*71.705= Rs.15201.00

- c. **Loss of mandays:-**

- i. Cost of coupe working :-

Estimated total volume of timber & fuel= 1378.978 Cum..in 71.705 Hectare.

@Rs. 14.5 MD/ Cum or 2952 Rs./ per cum.

Therefore Mandays per hectare = (MD per Cum.x Volume of wood in Cum.)/ Area of forest land
=14.5x1378.978/71.705=278.85 MD/ Hectare

- ii. Cost of M.F.P. collection per hectare is about 60% of Gross revenue per hectare.

=212.00*60/100= Rs. 127.20 Per Hectare

Daily wages at present Rs.203.57

Mandays/hectare = Cost per Hectare / Daily wages =127.2/203.57= 0.63

- iii. Therefore total Mandays per hactare = 278.85+0.63 = 279.48 Mandays

Loss of total man days = 279.48x71.705 = 20040 mandays

Loss of Mandays in value = Total man days x Daily wages i.e. Rs.203.57

Loss of Mandays in value Rs. =20040x203.57

Loss of Mandays in value Rs = Rs.40,79,543.00

Total Loss of Forest= Loss due to (a+b+c) =1027571.00+15201.00+4079543.00

Total Loss of Forest = Rs.51,22,315.00

COST BENEFIT ANALYSIS

Project:- Construction of 132 KV DCSS Barsoor- Bijapur Transmission line.

- Total area of forest land in Hectare for diversion:-

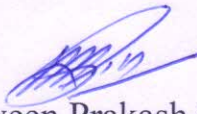
Division	Reserve Forest	Protected Forest	Orange area	Revenue forest	Total
Dantewada	24.601	24.141	-	22.963	71.705


Total No. of Trees: Dantewada Forest Division = 5206 Trees

PARAMETERS OF EVALUATION OF LOSS OF FOREST

Sl No	Parameters	Transmission line	
1	Loss of Value of timber fuel, wood and minor forest produce on an annual basis including loss of man hours per annum of people who derived live hood & wages from the harvest of these commodities	Due to construction of transmission line the required land width corridor will be deforested and loss of timber will be taken in account under the Environmental loss due to transmission line. The cut/ removed timber will be auctioned . There is no live hood who is falling on the transmission line alignment but surrounding forest area people may have fuel wood, minor forest loss from the harvest of these commodities. Hence effective loss only due to loss of fire wood and minor forest product those are worked out	
		Item	Forest Division Dantewada
		a. Value of timber fuel, wood in Rs.	1027571.00
		b. Value of minor forest produce Rs.	15201.00
		c. Loss of Mandays	40,79,543.00
		d. Total Rs.	51,22,315.00
2	Loss of animal husbandry productivity including loss of fodder	Productivity of animal husbandry including loss of fodder will not affected by transmission line, because these line will be drawn overhead in air and area below the line is totally free for animal husbandry productivity including fodder.	
3	Cost. Of human resettlement	There is no inhabitant as per record in transmission line corridor in forest land . Hence there would be no loss due to human settlement.	
4	Loss of public facilities and administrative infrastructure(roads, buildings, school, Dispensary, Electric lines, Railway etc., on forest land if these facilities were diverted due to the project.	The route/corridor of Transmission line not affecting any public facilities on forest land.	

5	Environment losses (soil erosion effect o hydrological cycle, wildlife habitats of Ecological balances.)	Environment losses is quantified as fallows.		
		Item	Forest Division Dantewada	
		a. Total forest area proposed for diversion in hectare	71.705	
		b. Environmental value of one Hectare of fully stocked forest (density 1.0) for period 50 year .	181. 00 lacs	
		c. Density of proposed forest	0.5	
		d. Total Environmental loss for a period of 50 year in lacs.	=71.705x181.00 x0.5	
			6489.30 lacs	
6	Suffering to outsets.	Not applicable since there is no displacement of people.		
7	NPV of proposed area to be diverted @ Rs. 9.39 Lacs per hectere			
	Compartment no	Area	Rate	Amount
	PF 1241, RF 1252, RF 1254, RF 1261, RF 1262, PF 1320 , PF 1972] PF 1973] PF 1977] PF 1978] PF 1990] RF 1965] RF 1966 48.722 Hact and Revenue Forest 22.963 Hact.	71.705	9.39 lacs	673.31 lacs
8	Total Loss	7213.83 lacs		


 (Praveen Prakash Singh)
 Executive Engineer
 E.H.T. (Maint.), Dn
 C.S.Power.Transmission.C.L.Bhilai


 Divisional Forest Officer
 Dantewada forest Division

COST BENEFIT ANALYSIS

Project:- Construction of 132 KV Barsoor- Bijapur Transmission line.

A. BENEFIT-

Calculation of cost benefit due to construction of Transmission line.


- i. Demand when proposed Transmission line commissioned $A=40$ MVA.
- ii. Expected sale of Energy in KWH/ year $B=A \times 1000 \times L.F. \times PF \times Hrs./year$
 $= 40 \times 1000 \times 0.8 \times 0.9 \times 8760$
 $= 252288000$ Units
- iii. Weighted average incremental tariff of state (Rs. Per unit) $C=0.25$
- iv. Value of benefit to CSPTCL for sale of Energy/year $D= B \times C$
 $D = 0.25 \times 252288000$
 $D= Rs. 630.72$ Lac
- v. Projected Demand increased per year @ 3 % /year till 50 year
 $E = 18.92$ lac/year
- vi. Net profit after $N=50$ year $= (N/2) \times \{2D + (50-1) \times E\}$
Net profit after 50 year $= (50/2) \times \{2 \times 630.72 + 49 \times 18.92\}$
Net profit $= 54713$ lac


B. COST-

- 1) Investment Cost of the Project - 7875.00Lacs
- 2) Total Loss due to Forest Diversion - 7213.83 Lacs.
- 3) **Total Loss (2+3)** - **15088.83 Lacs**

C. COST BENEFIT RATIO

$$\begin{aligned} &= 15088.83/54713 \\ &= 1:3.62 \\ \text{Ratio} &= 1:3.62 \end{aligned}$$



(Praveen Prakash Singh)
Executive Engineer
E.H.T. (Maint.), Dn
C.S.Power.Transmission.C.L.
Bhilai


Divisional Forest Officer
Dantewada Division

छत्तीसगढ़ राज्य विद्युत पारेषण कम्पनी मर्यादित द्वारा 132 के.व्ही. डी.सी.एस.एस. बारसूर
— बीजापुर विद्युत पारेषण लाईन

कास्ट/वेनिफिट एनालिसिस

संलग्न है।



वनमंडलाधिकारी
बीजापुर वनमण्डल, बीजापुर (छ.ग.)


COST BENEFIT ANALYSIS
CALCULATION OF LOSS OF FOREST

PARAMETERS OF EVALUATION OF LOSS OF FOREST

Project	Construction of 132 KV DCSS Barsoor- Bijapur Transmission line
Forest land need to be diverted in Hectare	27.714 Hectare
Average quality of forest	IV a & IV B
Average density of forest	0.4 to 0.5
No of trees (above 20 cm girth)	927
1 Evaluation of Loss of Value of timber fuel, wood and minor forest produce on an annual basis including loss of man hours per annum of people who derived live hood & wages	
A. Evaluation of loss of timber, fuel, minor forest produce (M.F.P.), Mandays	
a. Estimated Timber volume	283.14 Cum
b. Estimated Fuel volume	818.385 Cum
c. Estimated Total Timber & Fuel volume	1101.525 Cum
d. Estimated Total value of timber & fuel loss	3368852.00 Rupee
B. Value of minor forest produce (M.F.P.)	
a. Total forest Area for diversion in Hectare	27.714 Hectare
b. Total annual income from MFP in the Division.	30096447.00 Rupee
c. Total forest area of Division in Hectare	320264.00 Hectare
d. Average annual revenue per Hectare from M.F.P.	94 Rupee
e. Value of M.F.P. loss = Average annual revenue per Hectare x Area of diverted forest	2604 Rupee
C. Loss of mandays:-	
a. Cost of coupe working :-	14.5 MD/ Cum or 2952 Rs./ per cum.
b. Estimated total volume of timber & fuel =	1101.525 Cum. in 27.714 Hectare.
c. Mandays per hectare =	MD per Cum.x Volume of wood in Cum.)/ Area of forest land
Mandays per hectare =	,=14.5*1101.525/27.714
d. Therefore Coupe working Mandays per hectare	576.32 Mandays/Hec.
e. Cost of M.F.P. collection per hectare is about 60% of Gross revenue per hectare	,=94.00*60/100
Cost of M.F.P. collection per hectare	56.38 Rupee
f. Present Daily wages	203.57 Rupee
g. M.F.P. collection Mandays/hectare	,= Cost of M.F.P. collection per hectare / Daily wages =94.00/203.57
h. M.F.P. collection Mandays/hectare	0.28 Mandays/Hec.
i. Total Mandays per hectare = 576.32+0.28	576.60 Mandays/Hec.
j. Total Loss of mandays = 576.94x71.705	15979.79 Mandays
k. Loss of Mandays in value = Total loss of man days x Daily wages	,=15979.79x203.57

1.	Total Loss of Mandays in value	3253005.58 Rupee		
	Total loss of timber, fuel, minor forest produce (M.F.P.), Mandays = Loss due to (1A.e+1B.e+1C.l)	6624461.97 Rupee		
2	Loss of animal husbandry productivity including loss of fodder	Productivity of animal husbandry including loss of fodder will not be affected by transmission line, because these lines will be drawn overhead in air and area below the line is totally free for animal husbandry productivity including fodder.		
3	Cost. Of human resettlement	There is no inhabitant as per record in transmission line corridor in forest land. Hence there would be no loss due to human settlement.		
4	Loss of public facilities and administrative infrastructure (roads, buildings, school, Dispensary, Electric lines, Railway etc., on forest land if these facilities were diverted due to the project.	The route/corridor of Transmission line not affecting any public facilities on forest land.		
5	Environment losses (soil erosion, effect on hydrological cycle, wildlife habitats, microclimate upsetting of Ecological balances.)	Environment losses is quantified as follows.		
	Items	Forest Division Dantewada		
	a. Forest area proposed for diversion in hectare	27.714		
	b. Environmental value of one Hectare of fully stocked forest (density 1.0) for period 50 year.	181.00		
	c. Density of proposed forest	0.5		
	d. Total Environmental loss for a period of 50 year in lacs.	=27.714x181 x0.5		
	d. Total Environmental loss for a period of 50 year in lacs.	2508.12 lacs		
6	Suffering to outsets.	Not applicable since there is no displacement of people.		
7	NPV of proposed area to be diverted @ Rs. 9.39 Lacs per hectare			
	Compartment no	Area in Hectare	Rate Rs.in lac	Amount in lacs
	BIJAPUR FD - RF 65, RF 66, RF 67, OA 1093, Revenue Forest 12.986 Hac.	27.714	9.39 lacs	260.23
	Total NPV	260.23 lacs		
8	Total Loss (1 to 7)	2834.60 lacs		


 (Praveen Prakash Singh)
 Executive Engineer
 E.H.T. (Maint.), Division
 C.S.Power.Transmission.Co.Ltd.Bhilai


 Divisional Forest Officer
 Bijapur forest Division, Bijapur


COST BENEFIT ANALYSIS (TOTAL)**Project:-** Construction of 132 KV Barsoor- Bijapur Transmission line.**D. BENEFIT-****Calculation of cost benefit due to construction of Transmission line.**

- j. Demand when proposed Transmission line commissioned $A=40$ MVA.
- ii. Expected sale of Energy in KWH/ year $B=A \times 1000 \times L.F. \times PF \times Hrs./year$
 $= 40 \times 1000 \times 0.8 \times 0.9 \times 8760$
 $= 252288000$ Units
- vii. Weighted average incremental tariff of state (Rs. Per unit) $C=0.25$
- viii. Value of benefit to CSPTCL for sale of Energy/year $D= B \times C$
 $D=0.25 \times 252288000$
 $D= Rs. 630.72$ Lac
- ix. Projected Demand increased per year @ 3 % /year till 50 year
 $E=18.92$ lac/year
- x. Net profit after $N=50$ year $= (N/2) \times \{2D + (50-1) \times E\}$
 Net profit after 50 year $= (50/2) \times \{2 \times 630.72 + 49 \times 18.92\}$
Net profit $= 54713$ lac

E. COST-

- 3) Investment Cost of the Project - 7875.00Lacs
- 4) Total Loss due to Forest Diversion - 2834.60 Lacs.
- 5) Total Loss (2+3) - **10709.60 Lacs**

F. COST BENEFIT RATIO $= 10709.60/54713$ $= 1:5.11$ **Ratio = 1:5.11**


 (Praveen Prakash Singh)
 Executive Engineer
 E.H.T. (Maint.), Dn
 C.S.Power.Transmission.C.L.
 Bhilai


 (Divisional Forest Officer
 Bijapur Division, Bijapur

COST BENEFIT ANALYSIS
CALCULATION OF LOSS OF FORESTIS

PARAMETERS OF EVALUATION OF LOSS OF FOREST

PARAMETERS OF EVALUATION OF LOSS OF FOREST				
	Project	Construction of 132 KV DCSS Barsoor- Bijapur Transmission line		
	Forest land need to be diverted	99.914	Hectare	
	Average quality of forest	IV A & IV B		
	Average density of forest	0.4 to 0.5		
	No of trees (above 20 cm girth)	6133		
1	Evaluation of Loss of Value of timber fuel, wood and minor forest produce on an annual basis including loss of man hours per annum of people who derived live hood & wages			
	A. Evaluation of loss of timber, fuel, minor forest produce (M.F.P.), Mandays			
	Items	Forest Division Dantewada	Forest Division Bijapur	Total
	a. Estimated Timber volume in Cum	825.898	283.14	1109.038
	b. Estimated Fuel volume in Cum	553.08	818.385	1371.465
	c. Estimated Total Timber & Fuel volume in Cum	1378.978	1101.525	2480.503
	d. Estimated Total value of timber & fuel loss in Rs.	1027571.00	3368852.00	4396423
	e. Estimated loss of timber, fuel as per enumeration list	4396423.00		Rupee
	B. Value of minor forest produce (M.F.P.)	Forest Division Dantewada	Forest Division Bijapur	Total
	a. Total forest Area for diversion in Hectare	71.705	27.714	99.419
	b. Total annual income from MFP in the Division.	36216214.00	30096447.00	
	c. Total forest area of Division in Hectare	171068.50	320264.00	
	d. Average annual revenue per Hectare from M.F.P.	212.00	94	
	e. Value of M.F.P. loss = Average annual revenue per Hectare x Area of diverted forest in Rs.	15201.46	2604	17806
	C. Loss of mandays:-	Forest Division Dantewada	Forest Division Bijapur	
	a. Coupe working Mandays per hectare	278.85	576.32	Mandays/Hec.
	b. M.F.P. collection Mandays/hectare	0.63	0.28	Mandays/Hec.
	c. Total Mandays per hactare (1.c.a+1.c.b)	279.48	576.60	Mandays/Hec.
	d. Total Loss of mandays	20040	15,989.31	Mandays
	e. Loss of Mandays in value = Total loss of man days x Daily wages i.e. 203.57	4079543	3254943	Rupee
	Loss of timber, fuel, minor forest produce (M.F.P.), Mandays =Loss due to 10A.e+10B.e+10C.e	5122315	6626400	Rupee
	Total loss of timber, fuel, minor forest produce (M.F.P.), Mandays	11748715		Rupee
2	Loss of animal husbandry productivity including loss of fodder	Productivity of animal husbandry including loss of fodder will not affected by transmission line, because these line will be drawn overhead in air and area below the line is totally free for animal husbandry productivity including fodder.		
3	Cost. Of human resettlement	There is no inhabitant as per record in transmission line corridor in forest land . Hence there would be no loss due to human settlement.		
4	Loss of public facilities and administrative infrastructure(roads, buildings, school, Dispensary, Electric lines, Railway etc., on forest land if these facilities were diverted due to the project.	The route/corridor of Transmission line not affecting any public facilities on forest land.		

5	Environment losses (soil erosion effect o hydrological cycle, wildlife habitats of Ecological balances.)	Environment losses is quantified as fallows.		
	Items	Forest Division	Forest Division	Total
	a. Forest area proposed for diversion in hectare	71.705	27.714	99.419
	b. Environmental value of one Hectare of fully stocked forest (density 1.0) for period 50 year .	181.00 Lacs		
	c. Density of proposed forest	0.5	0.5	
	d. Total Environmental loss for a period of 50 year in lacs.	=71.705x181 x0.5	=27.714x181 x0.5	=99.419x181 x0.5
	d. Total Environmental loss for a period of 50 year in lacs.	6489.30	2508.12	8997.42
6	Suffering to outsets.	Not applicable since there is no displacement of people.		
7	NPV of proposed area to be diverted @ Rs. 9.39 Lacs per hectere			
	Compartment no	Area in Hectare	Rate Rs.in lac	Amount in lacs
	BIJAPUR FD - RF 65, RF 66, RF 67 , OA 1093 ,Revenue Forest 12.986 Hac.	27.714	9.39 lacs	260.23
	DANTEWADA FD- PF 1241, RF 1252, RF 1254, RF 1261, RF 1262, PF 1320 , PF 1972] PF 1973] PF 1977] PF 1978] PF 1990] RF 1965] RF 1966 48.722 Hact and Revenue Forest 22.963 Hact.	71.705	9.39 lacs	673.31
	Total NPV in lacs			933.54
8	Total Loss (1 to 7) in lacs	7213.84	2834.62	10048.45

Divisional Forest Officer
Bijapur forest Division,Bijapur

Executive Engineer
E.H.T. (Maint.), Division
C.S.Power.Transmission.Co.Ltd.Bhilai

Divisional Forest Officer
Dantewada forest Division,Dantewada

fn

Total

APPENDIX-II

COST BENEFIT ANALYSIS (TOTAL)

Project:- Construction of 132 KV Barsoor- Bijapur Transmission line.

A. BENEFIT-


Calculation of cost benefit due to construction of Transmission line.

- i. Demand when proposed Transmission line commissioned $A=40$ MVA.
- ii. Expected sale of Energy in KWH/ year $B=A \times 1000 \times L.F. \times PF \times Hrs./year$
 $= 40 \times 1000 \times 0.8 \times 0.9 \times 8760$
 $= 252288000$ Units
- iii. Weighted average incremental tariff of state (Rs. Per unit) $C=0.25$
- iv. Value of benefit to CSPTCL for sale of Energy/year $D= B \times C$
 $D=0.25 \times 252288000$
 $D= Rs. 630.72$ Lac
- v. Projected Demand increased per year @ 3 % /year till 50 year
 $E=18.92$ lac/year
- vi. Net profit after $N=50$ year $= (N/2) \times \{2D + (50-1) \times E\}$
Net profit after 50 year $= (50/2) \times \{2 \times 630.72 + 49 \times 18.92\}$
Net profit $= 54713$ lac

B. COST-

- 1) Investment Cost of the Project - 7875.00 Lacs
Total Loss due to Forest Diversion - 10048.45 Lacs.
- 2) Total Loss (2+3) - 17923.45 Lacs

C. COST BENEFIT RATIO $= 17923.45/54713$
 $= 1:3.053$
Ratio = 1:3.053


(Praveen Prakash Singh)
Executive Engineer
E.H.T. (Maint.), Dn
C.S.Power.Transmission.C.L.
Bhilai


(Divisional Forest Officer
Dantewada Division, Dantewada

