

COST BENEFIT ANALYSIS REPORT
FOR RENEWAL OF LEASE for 185.84 ha. FOREST LAND FOR
KAKRI OPEN CAST PROJECT
NORTHERN COALFIELDS LTD., SINGRAULI

INTRODUCTION

Kakri Project is one mine of the Northern Coalfields Limited, Singrauli (A subsidiary of Coal India Limited) which is operating in Sonbhadra District of Uttar Pradesh State having production capacity of 4 MTPA.


Name of Project	Total Area as per Mine Plan (Ha.)	Forest land as per Application	Revenue Forest	Non Forest Land as per Application	Life of mine in Yrs.	Balance Life of Mine in Yrs.
Kakri	828.84	185.84	Nil	Govt. Rev. land-253 ha. Tenancy land- 389 ha. Total -642 ha.	35	4


COMMUNICATION:


Name of Project Officer	:	
Address	:	O/o General Manager, Kakri Project, PO-Kakri , Dist-Sonbhadra, U.P.- 231220
Mobile no.	:	9415230918
Email Address	:	gmkak.ncl@coalindia.in

PURPOSE FOR COST BENEFIT ANALYSIS :

Cost Benefit Analysis report is required for making on line application in Part- 1 of FORM-B for renewal of lease. The report has been prepared on the basis of cost benefit analysis guidelines for forest diversion -2017 issued by MoEF&CC vide circular no. 7-69/2011-FC (Pt.) dated 01.08. 2017.


क्षेत्रीय वन अधिकारी
अनपरा रेंज
वन प्रभाग, रेनुकूट


Staff Officer (Mining)
Kakri Project


महा प्रबन्धक
ककरी वन विभाग
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Cost Benefit Analysis report as per guidelines issued by MoEF&CC vide circular no. 7-69/2011-FC
(Pt.) dated 01.08. 2017

ESTIMATION OF COST OF FOREST DIVERSION

SN	Parameters	Guidelines	Calculations	Cost (in Lakhs)
1	Ecosystem services losses due to proposed forest diversion	Economic value of loss of eco-system services due to diversion of forests shall be net present value (NPV) of the forest land being diverted as Prescribed by Central Government (MoEF&CC)	Net present value (NPV) of the forest land being diverted = 8.03 Lakhs /Ha. (NPV for Class-III, MDF) X 185.84 Ha=Rs. 1492.295 Lakhs (Ref: Table 2E) (may require to be paid during renewal)	1492.295
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 NPV is taken which is Rs. 149.229 Lakhs (10% of 1492.295) (Ref: Table 2E). As the mine is almost worked out, Loss of animal husbandry productivity, including loss of fodder should be NIL	NIL
3	Cost of human resettlement	To be Quantified and expressed in monetary terms as per approved R & R plan.	Actual Cost of human resettlement as per R&R Plan = 179 (Ref: Table 4) As life of the mine is almost over, Rehabilitation has been completed. It should be NIL)	NIL
4	Loss of public facilities and administrative infrastructure(Roads, buildings, schools, dispensaries, electric line, 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.	Actual cost - NIL	0.00

क्षेत्रीय वन अधिकारी	Staff Officer (Planning)	महा प्रबन्धक
अनपरा रेंज	Kakri Project	ककरी परियोजना

5	Possession value of forest land diverted	30% of environmental cost (NPV) due to loss of forest 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.	Circle rate of adjoining area =Rs. 0.190 lakhs/Ha. =Rs. 35.36 lakhs OR 30% NPV of Forest land = Rs. 447.688 Lakhs (Ref: Table 2E), whichever is higher ie; Rs. 447.688 Lakh	447.688
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 be not been shifted.	Cost of suffering of oustees : No. of Outsees = No. of PAFs = 445 No. of Days Worked per year = 300 Days (Assumed) Minimum wages of unskilled labour= 359 Thus Cost of Suffering of oustees= (1.5 times of earning of 2 years taken as per guidelines) 445 X 300 X 359 X 2 X 1.5 = Rs. 1437.8 Lakhs As the mine is almost worked out, Cost of suffering of oustees should be NIL	NIL
7	Habitat Fragmentation cost	While the relationship between Fragmentation and forest goods and 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.	50 % of NPV of forest land(1492.295) = Rs. 746.147 lakhs (Ref Table 2E) As the mine is almost worked out, Cost of Habitat Fragmentation cost should be NIL	NIL
8	Compensatory afforestation and soil & moisture conservation cost	The actual cost of Compensatory afforestation and soil & moisture conservation and its maintenance in future at present discounted value.	The calculated cost of Compensatory afforestation and soil & moisture conservation = Rs. 52.18 lakhs. (As the amount has already been paid in the year 1989, it should be NIL now)	NIL
Total cost of forest diversion(in lakhs Rs.)				1939.983

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अनपरा रेंज
वन प्रभाग, रेनुकूट


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Kakri Project


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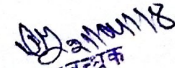
ESTIMATING BENEFITS OF FOREST – DIVERSION IN CBA

SN	Parameters	Guidelines	Calculations	Cost (in Lakhs)
1	Increase in productively attribute to the specific project	To Be quantified & expressed in monetary terms avoiding double counting.	10 Mt (balance coal reserve) X Rs. (-497.363 profit/te) X 10 = Rs. (-49736.30) lakhs	-49736.30
2	Benefits to economy due to specific project	The incremental economic benefit in monetary terms due to the activities attributed to the specific project.	Point no II (2)	67891.4192
3	No of population benefited due to specific project	As per detailed project Report	Point no. II(3)	17920 (Nos.)
4	Economic benefits due to direct and indirect employment due to project	As per detailed project Report	Page no. II(4)	26956.048
5	Economic benefits due to compensatory afforestation	Benefits from such compensatory forestation accruing over next 50 years monetized and discounted to the present value should be included as benefits of compensatory afforestation.	Point no. II (5)	533.53
TOTAL (1+2+4+5)				45644.697

Cost benefit ratio: 45644.697/1939.983 = 23.528


 क्षेत्रीय वन अधिकारी
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Calculation As Per MOEF&CC Circular No. 7-69/2011-FC(PT.) Dated, 01 August, 2017.

I. Estimation of cost of forest diversion

1. Ecosystem services losses due to proposed forest diversion

Economic value of loss of ecosystem services due to diversion of forest = Net present value (NPV) of the forest land being diverted = **Rs. 1492.295 Lakhs (Ref: Table 2E)**

2. Loss of animal husbandry productivity, including loss of fodder = Actual cost cannot be quantified at present as this is a renewal of lease and mine is almost worked out. However, as per MOEF&CC Circular No. 7-69/2011-FC(PT.) Dated, 01 August, 2017, 10% of NPV is taken which is **Rs. 149.229 Lakhs (Ref: Table 2E).**

As the mine is almost worked out, Cost of suffering of oustees should be **NIL.**

3. Cost of human resettlement

Cost of human resettlement as per R&R Plan = **179 lakhs (Ref. Table 4)**

4. Loss of public facilities and administrative infrastructure (Roads, buildings, schools, dispensaries, electric line, railways, etc.) on forest land, which would require forest land if these facilities were diverted due to the project –NIL.

5. Circle rate of adjoining area or Possession value of forest land diverted

Circle rate of adjoining area = Rs. 0.190 lakhs/Ha. = **Rs.35.36 lakhs**

OR

30% NPV of Forest land = **Rs. 447.688 Lakhs (Ref: Table 2E),**
whichever is higher means **Rs. 447.688 Lakhs**

6. Cost of suffering of oustees :

No. of Outsees = No. of PAFs = **445**

No. of Days Worked per year = **300 Days (Assumed)**

Minimum wages of unskilled labour = **Rs.359.00/day**

Thus Cost of Suffering of oustees = (1.5 times of earning of 2 years taken as per guidelines)

445 X 300 X 359 X 2 X 1.5 = Rs. 1437.8 Lakhs

As the mine is almost worked out, Cost of suffering of oustees should be **NIL.**

7. Habitat Fragmentation cost:

Cost due to fragmentation has been pegged at 50% of NPV applicable as a thumb rule

(Ref Circular MoEF) 50 % NPV = **Rs. 746.147 (Ref: Table 2E)**

As the mine is almost worked out, Cost of suffering of oustees should be **NIL.**

8. Compensatory afforestation and soil & moisture conservation cost = Rs. 52.18 lakhs paid during diversion in 1989

II. Estimating benefits of forest – diversion in CBA

1. Increase in productively attribute to the specific project- productively attribute

$P = \text{Rs. } (-497.363) \times 10 \times 10 = \text{Rs. } (-49736.3) \text{ lakhs}$

2. Benefits to economy due to specific project:

Different Benefits	In Lakhs	Ref Table
BE(Royalty)	14364.56	Table 5(a)
BE(DMF)	4309.368	Table 5(a)
BE(NMF)	287.2912	Table 5(a)
BE(GST) 5%	5130.2	$(10 \times 1026.04 \times 0.05 \times 10)$
BE(CESS)	40000	Table 5(b)
BE(Transit Fee)	3800	Table 5(b)
Total	67891.4192	

3. No of population benefitted due to specific project

Direct employment = 896

Indirect Employment = Direct Employment $\times 4 = 3584$

Considering avg. family size 4, then no. of Population benefitted = $(896 + 3584) \times 4 = 17920$

4. Economic benefits due to of direct and indirect employment due to project:

Economic benefits	Rs. In Lakhs
Direct Employment Benefit (coal Reserve X wage cost/te x income tax(20%))	$(10\text{MT} \times 10 \times 833.14 \times 0.2) = 16662.80$
Indirect employment benefit (Total manpower X 4 X 200 (Avg. working day/yr) X wages/day	$(896 \times 4 \times 200 \times 359 \times 4 \text{ yrs.}) / 100000 = 10293.248$
Total	26956.048

5. Economic benefits due to compensatory afforestation:

Economic benefits	In Rs. Lakh
<u>Due to compensatory afforestation</u> (CA land X Difference of NPV for class III forest (MDF-OF) X 0.8 (Doubling Factor)) $= (189.836 \times X(803000 - 626000) \times 0.8) / 100000 = \text{Rs. } 268.80 \text{ lakhs}$	268.80
<u>Due to compensatory afforestation as Carbon storage*</u> (CA land X Diff. of carbon storage) $/ 100000 = (189.836 \times (270040 - 95721) \times 0.8 / 100000) = \text{Rs. } 529.472346944$	264.73
Total	533.53

*Rate for carbon storage for class III forest- MDF-Rs. 270040/ha./yr. OF- Rs. 95721/ha./yr.

IMPACT ON LOCAL POPULATION AND R&R ACTION PLAN

Six Villages (Kakri, Basi, Rehta, Parasi, Audi, Nakti) were lying within the proposed mining area. 434 Project affected families (PAFs) (Kakri- 7, Basi-16, Rehta-364, Parasi-2, Audi, Nakti) were rehabilitated in 4 villages. Compensation of 1.23 Crore has been paid to the land oustees.

Table 1(b) Details of PAFs (Project affected families)	
Name of Project	No. of PAFs
Kakri Project	445(434 PAFs have been rehabilitated and 11 PAFs have taken monetary compensation)

Details of Calculations as referred above:

Details of Calculations

Table 2 (a) : Current NPV Rates – Recommended by Central Empowered Committee in 2008 (Rs. / Ha)				
Eco- Value Class	VDF(very dense forest)	MDF(moderately dense forest)	OF(open forest)	
Class III	8,87,000	8,03,000	6,26,000	

Table 2 (b): Economic value of carbon storage				
Class	Forest type group/ value of carbon storage(Rs/ Ha)	VDF ≥ 0.8	MDF (0.5 – 0.7)	OF (0.2 – 0.4)
III	Tropical dry deciduous forest	300064	270040	95721

Table 2 (C) : Rate of moisture conservation cost Rs/ Ha/Year			
Eco class	VDF	MDF	OF
Class III	1951	1269	527

Table 2 (D) : Rate of soil conservation cost Rs/ Ha/Year			
Eco class	VDF	MDF	OF
Class III	13947	9024	4101

Source: Revision of rates of NPV applicable for different class/category of forests published by Centre for Ecological Services Management (CESM), Indian Institute of Forest Management (IIFM), Bhopal in collaboration with Forest Survey of India (FSI), Dehradun, Nov. 2014

The nature of forest land, for which application for diversion of forest land is applied for at Kakri OCP (185.84 ha.) falls in Class III Open Forest. As such Rate of NPV comes out as Rs. 8.03 lakhs per ha.

Table 2(E): Calculation of NPV in respect to Bina-Kakri Amalgamation Project (Rate of NPV 8.03 Lakhs per Ha.)		
Description	Amount in Rs.	Amount in Rs. Lakhs
Total NPV for (185.84 Ha. forest land)		1492.295
10% NPV Value		149.229
30% NPV Value		447.688
50% NPV Value		746.147

Possession Value of Forest Land Diverted
CIRCLE RATE OF LAND

Type of Land nearby Forest Area	Avg. circle rate in Rs./Acre	Total Area in Ha.	Rate per Ha (in Rs.)	Cost of land in Lakhs
Agricultural	7700	185.84	19027.10	35.36

REHABILITATION COST:

Table 4: Compensation for Land as per R&R Policy	
Description	Amount in Lakhs
Monetary compensation paid for land, house, tree, well etc.	123
Cost of rehabilitation in form of land, house etc.	56
*Subsistence allowance to each affected family @ 25 days Minimum Agricultural Wages per month for one year.	Not applicable
*Affected landless tribal families will be provided one time financial assistance equivalent to 500 days average wages as a compensation for loss of customary rights.	Not applicable as it is a renewal case
Total	179

Table 5 (a) Royalty on coal			
Sl No	Royalty	Rate	Amount in lakhs
1	Basic royalty	14% of sale price= 0.14 x	14364.56

		1026.04(Rs./te) x 10 (MT)	
2	District Mining Fund	30% of royalty = 0.3 x royalty	4309.368
3	National Mineral fund	2% of royalty = 0.02 x Royalty	287.2912

Table5 (b): Levy and collection of Cess	
Rate of Coal Cess	Amount in lakhs
@Rs 400 per tonne	Rs. 400 x 10000000/100000= Rs.40000 lakhs
Forest Transit fees @ Rs 38 per tonne	Rs. 38 x 10000000/100000 = Rs. 3800 lakhs
Reference :Extraordinary gazette, part II – Sec 1, Ministry of law and justice Notification New Delhi , the 12 th April 2017	

OTHER DETAILS

Table 6 : Other Details		
1.	Manpower as per EPR/ Mine Plan	896
2.	Cost of Production in Rs. / te	Rs. 2097.36/te
3.	Mineable Reserves-	71.90 MT
4.	Life of the mine-	35 (balance life 4 yrs.)
5.	Grade of coal	G10
6.	Wage cost as per PR	Rs. 47.76 per ton
7.	Capital Investment as per PR	Rs. 258.89 Lakhs
8.	Wt. Avg. Sell price of coal per tone	Rs. 1026.04
9	Tenancy land in Kakri, Basi, Rehta, Parasi, Audi, Nakti villages	389 ha.
