

Northern Coalfields Limited
Khadia Area

**Cost Benefit Analysis Report for Diversion of 53.142 ha. Forest Land for
Khadia Expansion Opencast Coal Mining Project of
Northern Coalfields Ltd., Singrauli**

INTRODUCTION

Khadia Expansion Opencast Coal Mine of the Northern Coalfields Limited, Singrauli (A subsidiary of Coal India Limited) is operating in Singrauli District of Madhya Pradesh State and Sonebadra District of Uttar Pradesh having production capacity of 15 MTPA. Further 53.142 ha. forest land is required to be diverted for the expansion of project from 15 MTPA to 20 MTPA.

Name of Project	Total Area as per Mine Plan (Ha.)	Forest land already diverted (ha.)	Proposed Forest land to be diverted (ha.)	Non Forest Land involved (ha.)	Life of mine in Yrs.
Khadia Expansion OCP	1697.906	851.623	53.142	793.141	12 yrs. w.e.f 01.04.2023

PURPOSE FOR COST BENEFIT ANALYSIS :

Cost Benefit Analysis report is required for making on line application in Part- 1of FORM-A for diversion of forest land.

Cost Benefit Analysis report as per guidelines given in Annexure-III of Handbook of Forest (Conservation) Act, 1980 and Forest (Conservation) Amendment Rules 2016, issued by MoEF&CC:

ESTIMATED COST FOR FOREST DIVERSION

SN	Parameters	Guidelines	Calculations	Cost (in Lakhs)
1	Ecosystem services losses due to proposed forest diversion	Economic value of loss of ecosystem 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 = 12,28,590/ Ha. (NPV for Class-III Eco class, Dense Forest) X 53.142 Ha. = Rs. 652.897Lakhs	652.897
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.	As per MOEF&CC Circular No. 7-69/2011-FC(PT.) Dated 01 August 2017, 10% of NPV has been taken taken which is	65.289



			Rs. 65.289 Lakhs (10% of 652.897) (Ref: Table 1 below).	
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 = 169.52 Lakhs + 306.8 Lakhs = 476.32 lakhs (Ref: Table 3 below)	476.32
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.	No public facilities and administrative infrastructure (Roads, buildings, schools, dispensaries, electric line, railways, etc.) are existing on the forest land. Therefore, Loss on the above causes would be NIL	0.00
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.	Collector rate of adjoining area - Rs. 13.80 lakhs/Ha. = 53.142 ha. x Rs. 13.80 lakhs = Rs. 733.359 lakhs OR 30% NPV of Forest land = Rs. 652.897 x 0.3= Rs. 195.869 Lakhs whichever is higher ie; Rs. 733.359 Lakhs	733.359
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 Ousteas = No. of PAFs = 811 No. of Days Worked per year = 300 Days (Assumed) Minimum wages of unskilled labour = Rs. 477/manday Thus, Cost of Suffering of oustees = (1.5 times of earning of 2 years taken as per guidelines) 811 X 300 X 522 X 2 X 1.5/100000 = Rs. 3481.623 Lakhs (Ref. Table 6 (6) below)	3810.078
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	50 % of NPV of forest land = Rs. 12,28,590 x 53.142 x 50% = Rs. 326.448 lakhs	326.448

5 482

		fragmentation has been pegged at 50% of NPV applicable as a thumb rule.		
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 = @6 lakhs/ha. (assumed) for 53.142 = 6 x 53.142 x 2 = Rs. 318.852 lakhs.	318.852
Total cost of forest diversion (in lakhs)				6383.243

ESTIMATED BENEFITS FOR FOREST DIVERSION

SN	Parameters	Guidelines	Calculations	Benefits (in Lakhs)
1	Increase in productively attribute to the specific project	To Be quantified & expressed in monetary terms avoiding double counting.	35.46 MT (balance coal reserve) X Rs. 539.78 profit/te) X 10 = Rs. 191405.98 Lakhs	191405.98
2	Benefits to economy due to specific project	The incremental economic benefit in monetary terms due to the activities attributed to the specific project.	As calculated in Table 7 (2) below	283717.97
3	No. of population benefited due to specific project	As per detailed project Report	As calculated in Table 7 (3) below	12800 Nos.
4	Economic benefits due to direct and indirect employment due to project	As per detailed Project Report	As calculated in Table 7 (4) below	49421.96
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.	As calculated in Table 7 (5) below	143.91
TOTAL (1+2+4+5)				524689.82

Cost benefit ratio: 524689.82/6383.243= 82.19



The nature of forest land, for which application for diversion of forest land is applied for Khadia OCP (53.142 Ha) falls in Class III Dense Forest (DF). The rate of NPV is Rs. **12,28,590** per ha.

Current NPV Rates –			
(Rs. / Ha)			
Eco- Value Class	VDF(very dense forest)	DF(dense forest)	OF(open forest)
Class III Forest	1357110	12,28,590	957780

Table 1 : Calculation of NPV in respect to Khadia Expansion OCP
(Rate of NPV Rs. 12,28,590 per Ha. for Class III Dense Forest)

Description	Amount in Lakhs
Total NPV for (53.142 Ha. forest land - Class III Dense Forest)	652.897
10% NPV Value	65.289
30% NPV Value	195.869
50% NPV Value	326.448

Table- 2 : Possession Value of Forest Land Diverted

CIRCLE RATE OF LAND

Type of Land nearby Forest Area	Avg. circle rate in Lakhs/Acre	Total Area in Ha.	Rate per Ha. (lakhs)	Cost of land in (Lakhs)
	a	b	c	d= b x c
Agricultural	5.584	53.142	13.80	733.359

REHABILITATION COST:

Table 3: Compensation for Land as per R&R Policy	
Description	Amount in Lakhs
Monetary compensation paid for land, house, tree, well etc.	169.52
Cost of rehabilitation in form of land, house etc.	306.8
*Subsistence allowance to each affected family @ 25 days Minimum Agricultural Wages per month for one year.	Not applicable for open cast mine
Total	476.32

Table 4 (a) : Royalty on Coal			
S.N.	Royalty	Rate	Amount in lakhs
1	Basic royalty	14% of sale price= 0.14 x 1204.73 (Rs./te) x 35.46 (MT) x 10 = 59807.62 lakhs	59807.62

[Handwritten signature]

2	District Mining Fund	30% of royalty = $0.3 \times \text{royalty i.e } 0.3 \times \text{Rs. 59807.62 lakhs} = \text{Rs. 17942.28 lakhs}$	17942.28
3	National Mineral fund	2% of royalty = $0.02 \times \text{Royalty i.e } 0.02 \times \text{Rs. 59807.62 lakhs} = \text{Rs. 1196.15 lakhs}$	1196.15

Table 4 (b): Levy and collection of Cess

Rate of Coal Cess	Amount in lakhs
GST @ 5% of sell price	Rs. 1204.73 (Rs./te) \times 35.46 MT \times .05 \times 10 = 21359.86 lakhs
MP Gramin Avasanrachna Tatha Sarak Vikas Adhiniyam (MPGSTVA) Cess @ 5%	Rs. 1204.73 (Rs./te) \times 35.46 MT \times .05 \times 10 = 21359.86 lakhs
GST Compensation Cess - @Rs 400 per tonne	Rs. 400 \times 35.46 MT \times 10 = Rs. 141840 lakhs
Transit fees @ Rs. 57/tonne for 35.46 MT	Rs. 57 \times 35.46 MT \times 10 = Rs. 20212.2 lakhs

OTHER DETAILS

Table 5 : Other Details		
1.	Manpower as per EPR/ Mine Plan	1600
2.	Cost of Production in Rs. / te	Rs. 664.95/te,
3.	Extractable Reserves due to proposed forest land	35.46 MT
4.	Life of the mine-	12 Yrs. W.e.f. 01.04.2023
5.	Grade of coal	G8-G9, Avg.- G9
6.	Wage cost/te as per PR	Rs. 131.59/tonne
7.	Capital Investment as per PR	Additional 491.67 crore
8.	Wt. Avg. Sell price of coal per tone	Rs. 1204.73/tonne
9.	Tenancy land	Nil
10.	Minimum Labour wages-Unskilled labour	Rs. 522/day (As on 01.04.2024)

Calculation as per guidelines given in Annexure-III of Handbook of Forest(Conservation) Act, 1980 and Forest (Conservation) Amendmend Rules 2016, issued by MoEF&CC.

Table - 6. 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. 652.897 Lakhs (Ref: Table 1 above)**

2. **Loss of animal husbandry productivity, including loss of fodder** = As per MOEF&CC Circular No. 7-69/2011-FC(PT.) Dated, 01 August, 2017, 10% of NPV is taken for fresh lease which is Rs. 65.289 Lakhs (**Ref: Table 1 above**).
3. **Cost of human resettlement**
Cost of human resettlement as per R&R Plan = Rs. 169.52 lakhs + Rs. 306.8 lakhs = **476.32 lakhs (Ref. Table 3 above)**
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/Collector rate of adjoining area or Possession value of forest land diverted**
Collector rate of adjoining area = Rs. 13.80 lakhs/Ha.
For 53.142 ha. = Rs. 13.80 lakhs x 53.142 = Rs. 733.359 lakhs
- OR**
- 30% NPV of Forest land = Rs. 195.869 Lakhs (Ref: Table 1),
whichever is higher means Rs. 733.359 Lakhs
6. **Cost of suffering of oustees :**
No. of Outsees = No. of PAFs = 811
No. of Days Worked per year = 300 Days (Assumed)
Minimum wages of unskilled labour = Rs. 522.00/day
Thus Cost of Suffering of oustees = (1.5 times of earning of 2 years taken as per guidelines)
 $811 \times 300 \times 522 \times 2 \times 1.5 / 100000 = \text{Rs. } 3810.078 \text{ Lakhs}$
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. 326.448 lakhs (Ref: Table 1 above)**
8. **Compensatory afforestation and soil & moisture conservation cost = @6 lakhs/ha. for 53.142 = 6 x 53.142 = Rs 318.852 lakhs.**

Table -7 .

Estimating benefits of forest – diversion in CBA

1. **Increase in productively attribute to the specific project- productively attribute**
 $P = 35.46 \text{ MT (additional coal reserve)} \times \text{Rs. } 539.78 \text{ profit/te} \times 10 = \text{Rs. } 191405.98 \text{ Lakhs}$

2. **Benefits to economy due to specific project:**

Different Benefits	In Lakhs	Ref. Table above
Basic Royalty	59807.62	Table 4(a) above
District Mineral Fund	17942.28	Table 4 (a) above
National Mineral Fund	1196.15	Table 4 (a) above
GST 5%	21359.86	Table 4 (b) above

MP Gramin Avsanrachna Tatha Sarak Vikas Adhiniyam (MPGSTVA) Cess	21359.86	Table 4 (b) above
GST Compensation Cess @ Rs. 400/Ton	141840.00	Table 4 (b) above
Transit Fee @ Rs. 57/ton on 35.46 MT	20212.2	Table 4 (b) above
Total	283717.97	

3. No of population benefitted due to specific project:

Direct employment = 1600

Indirect Employment = Direct Employment x 2 = 3200

Considering avg. family size 4, then no. of Population will be benefitted = 3200 x 4 =
12800 nos.


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

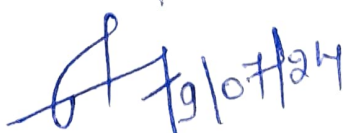
Economic benefits	Rs. In Lakhs
Direct Employment Benefit (Coal Reserve x wage cost/te X income tax (20%))	Rs. 35.46 (MT) x 131.59 (Rs./te) x 0.20 x 10 = Rs. 9332.36 lakhs
Indirect employment benefit = (Total manpower = 1600) x 2 x 12 (life of mine) x 200 (Avg. working day/yr.) x Min.wages/day (Rs. 522/manday)	Rs. 1600 x 2 x 12 x 200 x 522 / 100000 = Rs. 40089.60 lakhs
Total	49421.96 lakhs

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 (Dense forest - open forest) = (53.142 ha X (12,28,590-957780) / 100000 = Rs. 143.91 lakhs	143.91


Staff Officer (Mining)
Khadia Area


Nodal Officer (Env)
Khadia Area


Area General Manager
Khadia Area