

**Cost Benefit Analysis Report for Diversion of 631.39 ha. Forest Land for
Block-B Expansion Opencast Coal Mining Project of
Northern Coalfields Ltd., Singrauli**

INTRODUCTION

Block-B 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 having production capacity of 5.47 MTPA. Further 631.39 ha. forest land is required to be diverted for the expansion of project from 5.47 MTPA to 8.00 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.
Block-B	2257.17	447	631.39	1178.78	18 yrs. W.e.f 01.04.2020

COMMUNICATION:

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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) Amendmend Rules 2016, issued by MoEF&CC:

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, Dense Forest) X 631.39 Ha. = Rs. 5070.06 Lakhs	5070.06
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	507.00



			NPV has been taken taken which is Rs. 507.00 Lakhs (10% of 5070.06) (Ref: Table 1).	
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 = 15991.58 lakhs + 19766.95 lakhs = 35758.53 lakhs (Ref: Table 3 below)	35758.53
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. 62.32 lakhs/Ha. = 631.39 ha. x Rs. 62.32 lakhs = Rs. 39348.22 lakhs OR 30% NPV of Forest land = Rs. 5070.06 x 0.3 = Rs. 1521.01 Lakhs whichever is higher ie; Rs. 39348.22 Lakhs	39348.22
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 = 207 No. of Days Worked per year = 300 Days (Assumed) Minimum wages of unskilled labour = Rs. 403/manday Thus, Cost of Suffering of oustees = (1.5 times of earning of 2 years taken as per guidelines) 207 X 300 X 403 X 2 X 1.5 = Rs. 750.78 Lakhs (Ref. Table 6 (6) below)	750.78
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. 8.03 x 631.39 x 50% = Rs. 2535.03 lakhs	2535.03

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		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 = for 1300 ha. degraded forest land = Rs. 4944.39 lakhs.	4944.39
Total cost of forest diversion (in lakhs)				88914.01

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.	127.13 MT (balance coal reserve) X Rs. 313.26 profit/te) X 10 = Rs. 398247.43 lakhs	398247.43
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	1019543.39
3	No. of population benefited due to specific project	As per detailed project Report	As calculated in Table 7 (3) below	10144 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	74038.82
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	1765.04
TOTAL (1+2+4+5)				1499594.68

Cost benefit ratio: 88914.01/1499594.68= 1:16.86



The nature of forest land, for which application for diversion of forest land is applied for Block-B OCP (631.39 ha.) falls in Class III Dense Forest (DF). The rate of NPV is Rs. **8.03** lakhs per ha.

Current NPV Rates –			
(Rs. / Ha)			
Eco- Value Class	VDF(very dense forest)	DF(dense forest)	OF(open forest)
Class III Forest	8,87,000	8,03,000	6,26,000

Table 1 : Calculation of NPV in respect to Block-B Project
(Rate of NPV 8.03 Lakhs per Ha. for Class III Dense Forest)

Description	Amount in Rs.	Amount in Lakhs
Total NPV for (631.39 Ha. forest land - Class III Dense Forest))		5070.06
10% NPV Value		507.00
30% NPV Value		1521.01
50% NPV Value		2535.03

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	25.22	631.39	62.32	39348.22

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.	19766.95
Cost of rehabilitation in form of land, house etc.	15991.58
*Subsistence allowance to each affected family @ 25 days Minimum Agricultural Wages per month for one year.	Not applicable for open cast mine
Total	35758.53

Table 4 (a) : Royalty on Coal

S.N.	Royalty	Rate	Amount in lakhs
1	Basic royalty	14% of sale price= 0.14 x 1386.83 (Rs./te) x 127.13 (MT) x 10 = 246830.77 lakhs	246830.77
2	District Mining Fund	30% of royalty = 0.3 x royalty i.e 0.3 x Rs. 246830.77 lakhs = Rs. 74049.23 lakhs	74049.23
3	National Mineral fund	2% of royalty = 0.02 x Royalty i.e 0.02 x 246830.77 lakhs = Rs. 4936.61 lakhs	4936.61



Table 4 (b): Levy and collection of Cess

Rate of Coal Cess	Amount in lakhs
GST @ 5% of sell price	Rs. 1386.83 (Rs./te) x 127.13MT x .05 x 10 = 88153.84 lakhs
MP Gramin Avsanrachna Tatha Sarak Vikas Adhiniyam (MPGSTVA) Cess @ 5%	Rs. 1386.83 (Rs./te) x 127.13MT x .05 x 10 = 88153.84 lakhs
GST Compensation Cess - @Rs 400 per tonne	Rs. 400 x 127.13MT x 10 = Rs. 508520 lakhs
Transit fees @ Rs. 7/tonne	Rs. 7 x 127.13 MT x 10 = Rs. 8899.10 lakhs

OTHER DETAILS

Table 5 : Other Details		
1.	Manpower as per EPR/ Mine Plan	1268
2.	Cost of Production in Rs. / te	Rs. 1386.83/te,
3.	Mineable balance Reserves-	127.13 MT
4.	Life of the mine-	17 Yrs. W.e.f. 01.4.2020
5.	Grade of coal	G7-G13
6.	Wage cost/te as per PR	Rs. 146.49/tonne
7.	Capital Investment as per PR	Additional 998.71 crore
8.	Wt. Avg. Sell price of coal per tone	Rs. 1386.83/tonne
9	Tenancy land- Muher and Padri village	121.11
10	Minimum Labour wages-Unskilled labour	Rs. 403/day

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. 5070.06 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. 507.00 Lakhs (Ref: Table 1 above).**3. Cost of human resettlement**

Cost of human resettlement as per R&R Plan = Rs. 19766.95 lakhs + Rs. 15991.58 lakhs = 35758.53 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. 62.32 lakhs/Ha.

For 631.39 ha. = Rs. 62.32 lakhs x 631.39 = Rs. 39348.22 lakhs

OR

30% NPV of Forest land = **Rs. 1521.01 Lakhs** (Ref: Table 1),
whichever is higher means Rs. 39348.22 Lakhs

6. Cost of suffering of oustees :

No. of Outsees = No. of PAFs = 207

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

Minimum wages of unskilled labour= Rs.403.00/day

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

207 X 300 X 403 X 2 X 1.5 = **Rs. 750.78 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. 2535.03 lakhs** (Ref: Table 1 above)

8. Compensatory afforestation and soil & moisture conservation cost= @6 lakhs/ha. for 1300 ha. = Rs. 4944.39 lakhs.

Table -7 . Estimating benefits of forest – diversion in CBA

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

P = 127.13MT (balance coal reserve) X Rs. 313.26 profit/te) X 10 =

= **Rs. 398247.43 lakhs**

2. Benefits to economy due to specific project:

Different Benefits	In Lakhs	Ref. Table above
Basic Royalty	246830.77	Table 4(a) above
Distrcet Mineral Fund	74049.23	Table 4 (a) above
National Mineral Fund	4936.61	Table 4 (a) above
GST 5%	88153.84	Table 4 (b) above
MP Gramin Avsanrachna Tatha Sarak Vikas Adhinyam (MPGSTVA) Cess	88153.84	Table 4 (b) above
GST Compensation Cess @ Rs. 400/Ton	508520.00	Table 4 (b) above
Transit Fee @ Rs. 7/ton)	8899.10	Table 4 (b) above
Total	1019543.39	

3. No of population benefitted due to specific project:

Direct employment = 1268

Indirect Employment = Direct Employment x 2= 2536

Considering avg. family size 4, then no. of Population will be benefitted = 2536 x 4 =
10144 nos.

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%))	Rs. 127.13(MT) x 146.49 (Rs./te) X 0.20 x 10 = Rs. 37246.54 lakhs
Indirect employment benefit = (Total manpower = 1268) X 2 X 18 (life of mine) X 200 (Avg. working day/yr.) X wages/day (Rs. 403)	Rs. 1268 X 2 X 18 X 200 X 403 /100000 = Rs. 36792.28 lakhs
Total	74038.82 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) X 0.8 (Doubling Factor) =(1246.50 X (803000-626000) x 0.8)/100000 = Rs. 1765.04 lakhs	1765.04

IMPACT ON LOCAL POPULATION AND R&R ACTION PLAN

Two Villages Muher and Padri are lying within the proposed mining area of Block-B Expansion OCP. Total 207 nos. Project Affected Families will be rehabilitated in nearby Naudhiya Village. Plots have been earmarked.



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