

**Cost Benefit Analysis Report for Diversion of 229.348 ha. Forest Land for
Nigahi Expansion Opencast Coal Mining Project of
Northern Coalfields Ltd., Singrauli**

INTRODUCTION

Nigahi 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 21 MTPA. Further 229.348 ha. forest land is required to be diverted for the expansion of project from 15 MTPA to 25 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.
Nigahi Expansion OC	3582.723	1280.517	229.348	2072.858	19 yrs. w.e.f 01.04.2022

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 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 =12.28 Lakhs/Ha. (NPV for Class-III Eco class, Dense Forest) X 229.348 Ha. =Rs. 2816.39 Lakhs	2816.39
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 Rs. 281.64 Lakhs (10% of 2816.39) (Ref: Table 1 below).	281.64
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&RPlan = 26320.96lakhs + 53398.40 lakhs = 79719.36lakhs (Ref: Table 3 below)	79719.36



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. =229.348 ha. X Rs. 62.32 lakhs = Rs. 14292.96 lakhs OR 30% NPV of Forest land =Rs.2816.39x 0.3= Rs. 844.92 Lakhs whichever is higher ie; Rs. 14292.96 Lakhs	14292.96
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 = 4000 No. of Days Worked per year = 300 Days (Assumed) Minimum wages of unskilled labour= Rs. 427/manday Thus, Cost of Suffering of oustees= (1.5 times of earning of 2 years taken as per guidelines) 4000 X 300 X 427 X 2 X 1.5/100000 = Rs.15372.00Lakhs (Ref. Table 6 (6) below)	15372.00
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= Rs. 12.28 x 229.348 x 50% = Rs. 1408.19 lakhs	1408.19
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 229.348 x2 ha.= 6 x 229.348x 2 = Rs. 2752.176 lakhs.	2752.18
Total cost of forest diversion(in lakhs)				116642.72

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ESTIMATED BENEFITS FOR FOREST DIVERSION

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.	268.76 MT (balance coal reserve)XRs. 333.34 profit/te) X 10=Rs. 895884.00	895884.00
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	2196055.90
3	No.of population benefited due to specific project	As per detailed project Report	As calculated in Table 7(3) below	24344nos.
4	Economic benefits due to direct and indirect employment due to project	As per detailed Project Report	As calculated in Table 7(4) below	178695.00
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	993.76
TOTAL (1+2+4+5)				3271628.66

Cost benefit ratio:3271628.66/116642.72=1:28.04



The nature of forest land, for which application for diversion of forest land is applied for Nigahi OCP (229.348) falls in Class III Dense Forest (DF). The rate of NPV is Rs. **12.28** lakhs per ha.

Current NPV Rates –			
(Rs. / Ha)			
Eco- Value Class	VDF(very dense forest)	DF(dense forest)	OF(open forest)
Class III Forest	13,57,110	12,28,590	9,57,780

Table 1: Calculation of NPV in respect to Nigahi Project
(Rate of NPV 12.28 Lakhs per Ha. for Class III Dense Forest)

Description	Amount in Rs.	Amount in LakhsRs.
Total NPV for (229.348 Ha. forest land - Class III Dense Forest)		2816.39
10% NPV Value		281.64
30% NPV Value		844.92
50% NPV Value		1408.19

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	5.97	229.348	14.74	3380.59

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.	26320.96
Cost of rehabilitation in form of land, house etc.	53398.40
*Subsistence allowance to each affected family @ 25 days Minimum Agricultural Wages per month for one year.	Not applicable for open cast mine
Total	79719.36

Table 4 (a) : Royalty on Coal			
S.N.	Royalty	Rate	Amount in lakhs
1	Basic royalty	14% of sale price= 0.14 x 1460.34(Rs./te) x 268.76 (MT) x 10 = 549473.00 lakhs	549473.00
2	District Mining Fund	30% of royalty = 0.3 x royalty i.e 0.3 x Rs. 549473.00 lakhs = Rs. 164842.00 lakhs	164842.00
3	National Mineral fund	2% of royalty = 0.02 x Royalty i.e 0.02 x 549473.00 lakhs = Rs. 10989.00 lakhs	10989.00

Table4 (b): Levy and collection of Cess

Rate of Coal Cess	Amount in lakhs
GST @ 5% of sell price	Rs.1460.34 (Rs./te) x 268.76MT x .05 x 10 = 196240.00 lakhs
MP GraminAvsanrachnaTathaSarakVikasAdhiniyam (MPGSTVA) Cess @ 5%	Rs.1460.34(Rs./te) x 268.76MT x .05 x 10 = 196240.00 lakhs
GST Compensation Cess - @Rs 400 per tonne	Rs. 400 x 268.76MT x 10= Rs.1075040.00 lakhs
Transit fees @ Rs. 7/tonne for 46.17 MT	Rs. 7 x 46.17MT x 10 = Rs. 3231.90 lakhs

OTHER DETAILS**Table 5 :Other Details**

1.	Manpower as per EPR/ Mine Plan	3043
2.	Cost of Production in Rs. / te	Rs. 1127.01/te.
3.	Mineable Reserves due to expansion-	268.76 MT/ 46.17MT in forest land
4.	Life of the mine-	19 Yrs.W.e.f. 01.4.2022
5.	Grade of coal	G7-G13, Avg.- G9
6.	Wage cost/te as per PR	Rs. 139.06/tonne
7.	Capital Investment as per PR	Additional 1729.68crore
8.	Wt. Avg. Sell price of coal per tone	Rs. 1460.34/tonne
9.	Tenancy land in Muher and Medhauli village to be acquired	188 ha.
10.	Minimum Labour wages-Unskilled labour	Rs. 427/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. 2816.39Lakhs (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. 281.64 Lakhs (Ref: Table 1 above)**.

3. Cost of human resettlement

Cost of human resettlement as per R&R Plan = Rs. 26320.96lakhs + Rs. 53398.40lakhs = **79719.36lakhs (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 229.348 ha.= Rs.62.32 lakhs x 229.348 = Rs. 14292.96 lakhs

OR

30% NPV of Forest land = Rs. **844.92**(Ref: Table1),

whichever is higher means Rs. 14292.96 Lakhs

6. Cost of suffering of oustees :

No. of Outsees = No. of PAFs = 4000

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

Minimum wages of unskilled labour= Rs.427.00/day

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

4000 X 300 X 427 X 2 X 1.5 = **Rs. 15372.00 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. 1408.19 lakhs**(Ref: Table1 above)

8. Compensatory afforestation and soil & moisture conservation cost= @6 lakhs/ha. For 229.348 x 2 ha. = Rs. 2752.176 lakhs.

Table -7

Estimating benefits of forest – diversion in CBA

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

P = 268.76 MT (additional coal reserve) X Rs. 333.34profit/te) X 10 =**Rs. 895884.00 lakhs**

2. Benefits to economy due to specific project:

Different Benefits	In Lakhs	Ref. Table above
Basic Royalty	549473.00	Table 4(a) above
Distret Mineral Fund	164842.00	Table 4 (a) above
National Mineral Fund	10989.00	Table 4 (a) above
GST 5%	196240.00	Table 4(b) above

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MP GraminAvsanrachnaTathaSarakVikasAdhiniya m(MPGSTVA)Cess	196240.00	Table 4(b) above
GST Compensation Cess @ Rs. 400/Ton	1075040.00	Table 4(b) above
Transit Fee @ Rs. 7/ton on 46.17 MT	3231.90	Table 4(b) above
Total	2196055.90	

3.No of population benefitted due to specific project:

Direct employment = 3043

Indirect Employment = Direct Employment x 2 = 6086

Considering avg. family size 4, then no. of Population will be benefitted = 6086 x 4 =
24344 nos.

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

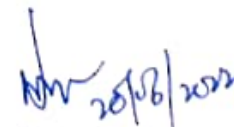
Economic benefits	Rs. In Lakhs
Direct Employment Benefit(Coal Reserve x wage cost/teX income tax(20%))	Rs. 268.76(MT) x 139.06 (Rs./te) x 0.20 x 10 = Rs. 74747.00lakhs
Indirect employment benefit = (Total manpower = 3043) x2 x20 (life of mine)x 200 (Avg. working day/yr.)xMin.wages/day (Rs. 427/manday)	Rs. 3043x2 x20x 200 x427/100000= Rs. 103948.00 lakhs
Total	178695.00lakhs

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) =(458.7haX (1228590-957780) x 0.8)/100000 = Rs. 993.76lakhs	993.76


Staff Officer(Mining)
Nigahi Area


Nodal Officer (Env)
Nigahi Area


(Harish Duhan)
Area General Manager
Nigahi Area