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COST BENEFIT ANALYSIS REPORT
BINA-KAKRI AMALGAMATION OPEN CAST PROJECT
NORTHERN COALFIELDS LTD., SINGRAULI

INTRODUCTION

Bina Extension Project is one of the coal mine of the Northern Coalfields Limited, Singrauli (A subsidiary of Coal India Limited) which is operating in Singrauli District of Madhya Pradesh & Sonbhadra District of Uttar Pradesh State having production capacity of 9.0 MTPA. Bina-Kakri Amalgamation Open Cast coal mining Project is expansion of the existing Bina Extn. Project for 14 MTPA (peak Production 17.5 MTPA) coal production.

The project report of Bina-Kakri Amalgamation project was approved by CIL board on 25th August 2020 for a targeted capacity of 14 MTPA (peak 17.5 MTY). The total estimated mineable reserve is 207.30 million tonne in both states.

Table 1(a) : Breakup of Land

Name of Project	Area as per PR(Ha)	Total Area as per forest Application (ha.)	Total Forest Land diverted(Ha.)		**Applied for diversion**(Ha.)	GMK JJ/Revenue Forest applied for diversion	Non Forest Land as per Application	Life of mine in Yrs
			M.P.	U.P.				
Bina-Kakri Amalgamation	2296.72	30.5	378.935	21.61	30.50	Nil	Nil	18

*Existing Bina Extn. Project having 1798 ha. lease hold & total 384.264 ha. forestland (353.764 ha. in MP &30.50 U.P.) as mentioned above have been applied for diversion.

PURPOSE FOR COST BENEFIT ANALYSIS :

Cost benefit report is required for making on line application in Part-1of FORM-A. 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.

IMPACT ON LOCAL POPULATION AND R&R ACTION PLAN

One Village (Kakri) is lying within the proposed mining area in U.P. state in which none of the population is required to be rehabilitate.

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OTHER DETAILS of the Mine

Table 7 : Other Details		
1.	Manpower as per EPR/ Mine Plan	1565
2.	Cost of Production in Rs. / te	994.96
3.	Mineable Reserves-	207.30
4.	Life of the mine-	*18 years*
5.	Grade of coal	*G9, G10*
6.	Wage cost as per PR	*Rs. 135.41 per ton*
7.	Capital Investment as per PR	12198 Lakhs
8.	Wt. Avg. Sell price of coal per tone	1361.58
9	Tenancy land	NIL

Table 1(b) Details of PAFs (Project affected families)	
Name of Project	**No. of PAFs**
Bina-Kakri Amalgamation Project	No PAF shall be shifted.

The nature of forest land for which application for diversion of forest land is applied at Bina-Kakri Amalgamation OCP(30.50ha.) falls in Class III highly dense Forest. As such Rate of NPV comes out as Rs. 13,57,110/- per ha.

Table 2 : Calculation of NPV in respect to Bina-Kakri Amalgamation Project (Rate of NPV Rs 13,57,110/- per Ha.)		
Description	**Amount in Rs.**	**Amount in Rs. Lakhs**
Total NPV for (30.50 Ha. forest land)	4,13,91,855.00	413.91855
10% NPV Value	41,39,185.50	41.391855
30% NPV Value	1,24,17,556.5	124.175565
50% NPV Value	2,06,95,927.5	206.959275

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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 = Rs 1357110/- per Ha. X 30.50Ha = Rs 4,13,91,855.00 (Ref: Table 2 above)	413.91855
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. 4139185.50/- (10% of 41391855) (Ref: Table 2 above).	41.391855
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 = NIL **(Ref:Table 4 below)**	0.00
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
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. 15 lakhs/ha.=Rs. 457.50 lakhsor 30% of NPVof forest land(413.91855) = Rs. 1,24,17,556.5/- (124.175 Lakhs)(Ref.**Table 2**above), whichever is higher	457.50

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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.	No. of Oustees = Nil	0
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 (413.91855) = Rs. 206.959275lakhs**(Ref Table 2 above)**	206.959275
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. 244 lakhs	244.00
Total cost of forest diversion(in lakhs Rs.)				1363.76968 lakhs

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ESTIMATING BENEFITS OF FOREST – DIVERSION IN CBA

S No.	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.	16.50 Milliontonne (coal reserve) X 173.21(profit/te) X10 =Rs. 28579.65 lakhs	28579.65
2	Benefits to economy due to specific project	The incremental economic benefit in monetary terms due to the activities attributed to the specific project.	Page no.6 point no. (2)	109212.16
3	No of population benefited due to specific project	As per detailed project Report	Page no.6 point no. (3)	992 (Nos.) and Total 4695
4	Economic benefits due to direct and indirect employment due to project	As per detailed project Report	Page no.7 point no.(4)	4558.30
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.	Page no. 7 point no (5)	238.489
TOTAL (1+2+4+5)				**142588.60**

Ratio of COST :BENEFIT =Rs.1363.76968 lakhs / Rs. 142588.60 lakhs= 1:104.55

Calculation As PerMOEF&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. 413.91855 Lakhs (Ref: Table2E above)**

2. **Loss of animal husbandry productivity, including loss of fodder** = Actual cost cannot be quantified at present as this is a extension and amalgamation of projects. However, as per MOEF&CC Circular No. 7-69/2011-FC(PT.) dated 01.08.2017,10% of NPV is taken which **is Rs. 41.391855 Lakhs(Ref: Table2above).**

3. Cost of human resettlement
Cost of human resettlement as per R&R Plan = **Not applicable**(No further human resettlementis required for the Amalgamation of project) **(Ref. Table 4 below)**

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.

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5. Circle rate of adjoining area or Possession value of forest land diverted
Circle rate of adjoining area = Rs. 15lakhs/Ha. = Rs. 457.50lakhs

OR

30% NPV of Forest land = **Rs. 124.175565 Lakhs** (Ref: Table2 above), **whichever is higher means Rs. 457.50Lakhs**

6. Cost of suffering of oustees :
No. of Oustees = No. of PAFs = 0
No. of Days Worked per year = 300 Days (Assumed)
Minimum wages of unskilled labour = Nil
Thus Cost of Suffering of oustees = **NIL**

7. Habitat Fragmentation cost :
Cost due to fragmentation has been pegged at 50% of NPV applicable as a thumb rule (Ref. Circular MoEF&CC dated 01.08.2017) 50 % NPV = **Rs. 206.959275 Lakhs (Ref:Table2 above)** . However, as it is amalgamation of project, no **Habitat fragmentation cost is involved.**

8.Compensatoryafforestation (Approx. 4 lakhs/ha.) and soil & moisture conservation cost=Rs. 30.50 x 2 x 4 = **Rs. 244 lakhs**

II. Estimating benefits of forest – diversion in CBA

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

P = Rs. 16.50X10X 173.21 (profit/te.)=**Rs. 28579.65 lakhs**

2. Benefits to economy due to specific project :

Different benefits	In Lakh	Reference Table
BE (CSR)	571.59	Table 6 below
BE(Royalty)	31452.49	Table 5(a) below
BE(DMF)	9435.74	Table 5(a) below
BE(NMF)	629.04	Table 5(a)page 6below
BE(GST) 5%	1123.30	(16.50*10*1361.58*0.05)
BE(CESS)	66000	Table 5(b) below
Total	109212.16	

3. No of population benefitted due to specific project
Direct employment for total 384.264 ha forest involved in mine= 1565,
No. of Direct employment for part 30.5 Ha forest land = 1565 X (30.5/384.264)=124
Indirect Employment = Direct Employment x 2 = 124 X 2 = 248
Considering avg. family size 4, then no. of Population benefitted = **248 X 4= 992 nos.**

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

Economic benefits	In Rs. Lakh
Direct Employment Benefit(coal Reserve X wage cost/te x income tax(20%))	**(16.5 X 135.41 X 10 X0.2)=4468.53**
Indirect employment benefit(Total manpower X4X200(Avg. working day/yr)X wages/day	**(124 X 2X200X181)/100000=89.776**
Total	**4558.306/-**

5. Economic benefits due to compensatory afforestation:

Economic benefits	In Rs. Lakh
Due to compensatory afforestation (2 times of Forest landXDifferenceof NPV for class III forest (DF-OF)X0.8 (Doubling Factor))=(2X30.50 X(1228590-957780)x0.8)/100000 = **Rs. 132.155 lakhs. Refer table 2 (C) below**	132.155
Due to compensatory afforestation as Carbon storage*= (2 times of Forest landXDiff. of carbon storage)/100000=(2X30.50 (270040-95721) X 0.8/100000) = **Rs. 106.334 lakh**	106.334
Total	**238.489 lakhs**

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

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Revision of Rates of NPV Applicable For Different Class/Category of Forests

Table 2 (a) : Current NPV Rates – Recommended by CEC (Rs. / Ha)			
Eco- Value Class	VDF(very dense forest)	MDF(moderately dense forest)	OF(open forest)
Class III	1357110	1228590	957780

Table 2 (b): Economic value of carbon storage

Class	Forest type group/ value of carbon storage(Rs/ Ha)	VDF	MDF	OF
III	Tropical dry deciduous forest	300064	270040	95721

* As per revised NPC rate vide guidelines of MoEF&CC issued on 6th January 2022.

Possession Value of Forest Land Diverted (CIRCLE RATE OF LAND)

Type of Land nearby Forest Area	Avg. circle rate in Rs./Decimal	Total Area in Ha.	Rate per Ha. (inRs.)	Cost of land in Lakhs
Agricultural	6050	30.50	1500000	457.50

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REHABILITATION COST:

Table 4: Compensation for Land as per R&R Policy Description	Amount in Rs. Lakhs
Monetary compensation to be paid for tenancy land	Not applicable
Monetary compensation to be paid for tree	Not applicable
*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 MAWs as a compensation for loss of customary rights.	Not applicable
Total	---

Table 5 (a) Royalty on coal			
Sl No	**Royalty**	**Rate**	**Amount in lakhs**
1	Basic royalty	14% of sale price = 0.14 x 1361.58 (Rs./te) x 16.5 (MT) X 10	31,452.498
2	District Mining Fund	30% of royalty = 0.3 x royalty	9,435.7494
3	National Mineral fund	2%of royalty = 0.02 x Royalty	629.04

Table5 (b): Levy and collection of Cess	
Rate of Coal Cess	**Amount in lakhs**
@Rs. 400 per tonne	Rs. 400 x 16500000 te./100000 = **Rs. 660000 lakhs**
Reference : Extraordinary gazette, part II – Sec 1, Ministry of law and justice Notification New Delhi, the 12thApril 2017	

Table 6 :CSR cost		
CSR cost	2% of retained profit	16.50 MT x10 x Rs.173.21/te(profit) x 0.02 = **571.593 Lakhs**
Ref: Company Act 2012		

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