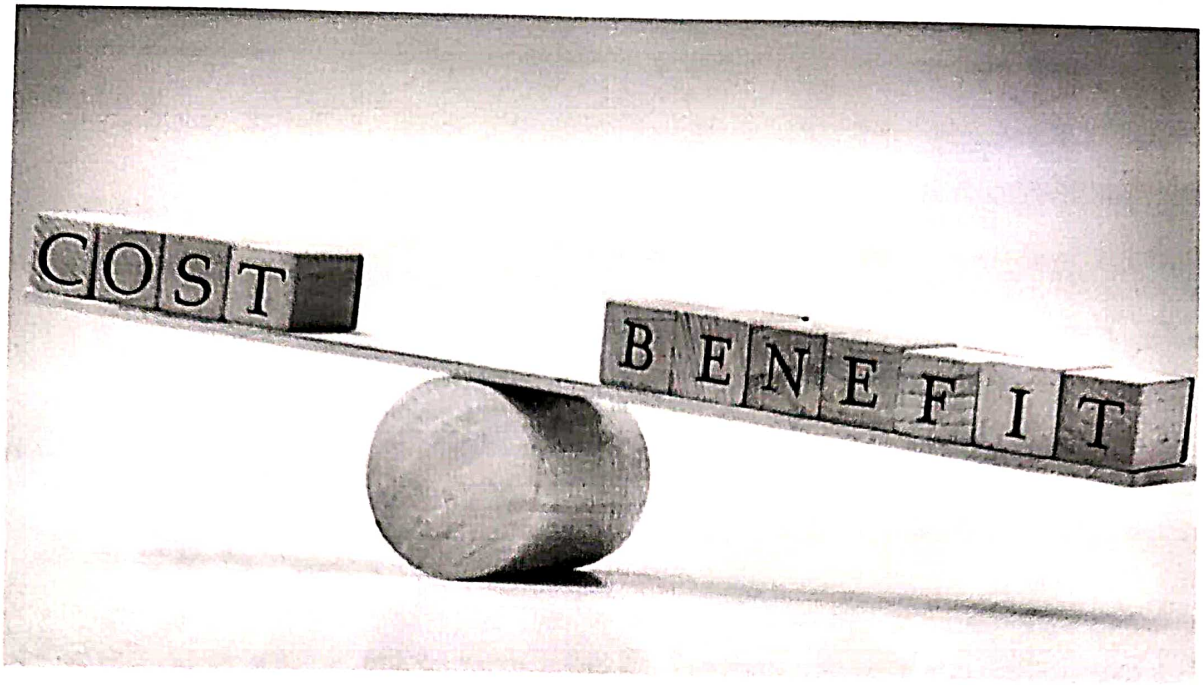

COST BENEFIT ANALYSIS REPORT

[as per MoEFCC Guideline 7-69/2011-FC(Pt.) dtd. 01 August, 2017]

Bharat Coking Coal Limited
(A Miniratna Company)

Muraidih Colliery (133.69 Ha)

Introduction:

Muraidih Colliery is an existing mine.The Muraidih project is confined within latitudes 23°48'49" &. 23°47'30" and longitudes 86°15'20"& 86°13'30" leasehold area of the mine is 717.71 ha of which 46.17 ha forest land and 87.52 Ha Jungle Jhari falls in quarriable zone. The area is covered under the toposheet no. F45C1 & F45C5. The Environmental clearance of Muraidih colliery granted vide letter no J-11015/35/2011-1A.11(M) dated 6 February, 2013 in cluster II. Exploration for the reserve of coal in the said project was conducted by CMPDI, a subsidiary of coal India ltd. Total coal reserve was found in 91.13MT.

Communication:

Name of Project Officer	:	Ashok Kumar
Address	:	Office of Project officer, Muraidih Colliery
Mobile no.	:	6287242873
Email Address	:	pomuraidih.bccl@coalindia.in

Purpose for Cost benefit analysis :

Cost benefit report is required for making on line application as per part 1,G. The report has been prepared on the basis of MoEFCC circular no.7-69/2011-FC(Pt.)dtd. 01 August, 2017. (Copy Attached as Annexure A).

Table 1: Breakup of Land

Area	Name of Project	Area as per Mine Plan	Total Area as per forest Application	Forest Land as per Application	Notified Forest as per Application	GMK JJ/Revenue Forest as per Application
Barora	Muraidih	717.71	133.69	133.69	46.17	87.52

The nature of forest land for which application for diversion of forest land to be applied at Muraidih Colliery (133.69 Ha) falls in Class III LDF forest. As such Rate of NPV comes out as Rs. 9,57,780/ Ha for 133.69 Ha of the proposed forest land for diversion.

Table 2: Calculation rate for NPV in respect of Muraidih Colliery

Description	Amount in Rs.	Amount in Rs. Lakhs
Total NPV @Rs. 9,57,780 per Ha for 133.69 Ha of the forest land proposed for diversion	9,57,780*133.69= 12,80,45,608.2/-	1280.45
10% NPV Value	12,80,456.08/-	128.045
30% NPV Value	3,84,13,682.46/-	384.14
50% NPV Value	6,40,22,804.1/-	640.23

Table 3: Rate of land as per circle rate

Name of Village	Forest Land (in Ha)	Circle rate per Decimal (in Rs.)
Barora	23.69	55000
Barmassia	110	18000

Total circle rate of 133.69 Ha= Rs. 8112.30 Lakhs

Other conversion factor 100 decimal = 1 acre; 1 Ha = 2.471 Acre = 247.1 Decimal

CALCULATION AS PER MOEFCC CIRCULAR NO. 7-69/2011-FC(PT.) Ddt. 01 AUGUST, 2017.

I. Estimation of cost for 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 as per prescribed by the Central Government (MoEF&CC).
   As the Forest land proposed does not fall in National park & Wild life sanctuary
   Ecosystem services losses due to proposed forest diversion for 133.69 Ha = **Rs.** 957780* 133.69 = 1280.45 **Lakhs** (Ref Table 2).

2. Loss of animal husbandry productivity, including loss of fodder
   No. of PAFs = 0
   Assuming no. of animal husbandry as 6 Factor = 60
   Loss of animal husbandry productivity, including loss of fodder = 0*6*365*60 = Rs. 0 Lakhs
   10% of NPV = **Rs. 128.045 lakhs** (ref Table 2)
   Since 10% of NPV is more, thus as per guideline
   Loss of animal husbandry productivity, including loss of fodder = **Rs. 128.045 lakhs**

3. Cost of human resettlement as per R&R Plan =**Rs 3663.63 Lakhs**

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 = Rs. 0.00

5. Possession value of forest land diverted
   Amount as per Circle rate of adjoining area= **Rs 8112.30 Lakhs** (Ref Table 3)
   30% NPV = **Rs. 384.14 Lakhs** (Ref Table 2)
   Since circle rate of adjoining area is more than NPV paid therefore as per guideline, Possession value of forest land diverted= **Rs 8112.30 Lakhs**

6. Cost of suffering of oustees is Nil as:
   No. Of Outsees = No. of PAFs = 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 % of NPV = **Rs. 640.23 Lakhs** (Ref table 2)

8. Compensatory afforestation and soil & moisture conservation cost
   Rate of Compensatory afforestation = Rs. 350000 / Ha
   Forest land = 133.69 Ha, Therefore CA land= 267.38 Ha
   Cost of Compensatory Afforestation = **Rs. 897.15 Lakhs**
   Total estimated Cost due to diversion of forest (in Rs. Lakhs) = **14721.81 Lakhs**

II. Estimating benefits of forest – diversion in CBA

1. Increase in productively attribute to the specific project
   Productively attribute = Profit per tonne x mineable reserve X 10 = 792959.6 lakh

2. Benefits to economy due to specific project: 772376.20 Lakhs
   A. CSR cost = 2 % of Profit= 12687.35 Lakh
   B. Royalty to the exchequer (15% of Sales Value) = Sale price x 91.13 MT x 15 % = Rs. 354182.04 Lakh

C. District Mining Fund (DMF) = 30 % of Royalty = Rs. 106254.61 Lakh
D. National Mineral fund = 2 % of Royalty = Rs. 7083.64 Lakh
E. Coal Cess = Rs. 291616 Lakh
F. GST Collected for Expenditures: Rs. 552.56 Lakh
Total Benefit= A+B+C+D+E+ F =12687.35 Lakh + 354182.04 Lakh + Rs. 106254.61 Lakh + Rs. 7083.64 Lakh+Rs. 291616 Lakh+552.56 Lakh = 772376.20 Lakhs

3. No. of population benefitted due to specific project
Direct employment = 990
Indirect Employment = 4950
Considering avg. family size 5, then no. of Population benefitted = 5940 x 5 = 29700

4. Economic benefits due to direct and indirect employment due to project
A. For indirect employment generated for= 4950 people
Avg. days of Working (as in Jharkhand) = 200 days
Rate of unskilled manpower = Rs. 315/- day
Life of mine = 30 years
Economic benefits due to indirect employment = Rs. 93555 Lakhs

B. For direct employment = 990 people
Economic benefits due to direct employment = Rs. 108444.7 Lakhs
Economic benefits due to of direct and indirect employment due to project =A+B= **Rs. 201999.7 lakhs**

5. Economic benefits due to compensatory afforestation
CA Land = 133.69 x2 = 267.38 Ha
Class of degraded forest land supposed to change from LDF to MDF

A. Thus change in benefits (as per NPV) [@ Rs (12,28,590 – 9,57,780) lakhs/ha= = 579.27 Lakhs
B. Economic value of carbon storage:
Change in economic value per Ha@ Rs (270040 – 95721)= Rs. 174319 = Rs. 1.74319 [Lakhs] for 60yrs.
Thus economic value for 267.38 Ha for 50 yrs = Rs. 372.87 Lakhs
Total Economic benefits due to compensatory afforestation = (A+B)= **Rs 952.14 Lakhs**

Table 4: Estimation of cost of forest diversion (as per table B of guidelines)

Sl No	Parameter	Result(in Lakhs)
1	Ecosystem services losses due to proposed forest diversion	1280.45
2	Loss of animal husbandry productivity, including loss of fodder	128.045
3	Cost of human resettlement	3663.62
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	0
5	Possession value of forest land diverted	8112.30
6	Cost of suffering of oustees	0
7	Habitat Fragmentation cost	640.22
8	Compensatory afforestation and soil & moisture conservation cost	897.15
	Total Loss in lakhs	**14721.8**

Table 5: Existing guidelines for estimating benefits of forest – diversion in CBA (As per Table C of Guidelines)		
Sl No	**Parameters**	**Result(in Lakhs)**
1	Increase in productivity attribute to the specific project	792959.60
2	Benefits to economy due to specific project	772376.20
3	No of population benefitted due to specific project	29700
4	Economic benefits due to of direct and indirect employment due to project	201999.70
5	Economic benefits due to compensatory afforestation	952.14
6	Total Benefit (2+4+5) in Lakhs	**975328.04**

Cost to Benefit ratio = 14721.8/975328.04 = 1: 66.25

Project officer
Muraidih Colliery

ASHOK KUMAR
Project Officer
Muraidih Colliery