



## **COST BENEFIT ANALYSIS REPORT**

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



Bharat Coking Coal Limited  
(A Miniratna Company)

**Kuya Colliery (16.49 Ha)**

  
परियोजना पदाधिकारी  
Project Officer  
कुईर्यो कोलियरी  
Kuya Colliery

**Introduction:**

Kuya Colliery is under operation prior to nationalization by ex colliery owners. The Kuya project having leasehold area of the mine is 340.50 Ha of which 117.51 Ha (101.02 Ha already granted) Notified forest land falls in quarriable zone. The application has been done for remaining notified Forest Land i.e. 16.49 Ha. The area is covered under the toposheet no. (F45C5)73 1/5. The Environmental clearance of Kuya colliery granted vide letter no J-11015/298/2010-IA.II(M) in cluster VIII. 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 19.024MT(Reserve in Forest Land- 2.154MT & Non forest Land- 16.87 MT).

**Communication:**

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**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.

Table 1: Breakup of Land(Ha)					
Area	Name of Project	Area as per Mine Plan	Total Forest Area in leasehold	Forest Land as per Application	Notified Forest already granted
Bastacolla	Kuya	340.50	117.51	16.49	101.02

The nature of forest land for which application for diversion of forest land to be applied at Kuya Colliery (16.49 Ha) falls in Class III DF forest. As such Rate of NPV comes out as Rs 12,28,590/ Ha for 16.49 Ha of the proposed forest land for diversion.

Table 2: Calculation rate for NPV in respect of Kuya Colliery		
Description	Amount in Rs.	Amount in Rs. Lakhs
Total NPV @Rs. 12,28,590 per Ha for 16.49 Ha of the forest land proposed for diversion	12,28,590*16.49 = 2,02,59,449.1/-	202.59
10% NPV Value	20,25,944.91/-	20.259
30% NPV Value	60,77,834.73/-	60.778
50% NPV Value	1,01,29,724.55/-	101.29

Table 3: Rate of land as per circle rate		
Name of Village	Forest Land (in Ha)	Circle rate per Decimal (in Rs)
Kuya	16.49 Ha	4,81,866

Total circle rate of 16.49 Ha= **Rs. 19,634.49 Lakhs**

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

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**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 16.49 Ha = **Rs. 12,28,590\* 16.49 = 202.59 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. 20.259 lakhs** (ref Table 2)

Since 10% of NPV is more, thus as per guideline

Loss of animal husbandry productivity, including loss of fodder = **Rs. 20.259 lakhs**

**3. Cost of human resettlement as per R&R Plan =Rs 0 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. 19,634.49 Lakhs** (Ref Table 3)

30% NPV = **Rs. 60.778 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 19634.49 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. 101.29 Lakhs** (Ref table 2)

**8. Compensatory afforestation and soil & moisture conservation cost: 225.14**

Rate of Compensatory afforestation = Rs. 350000 / Ha

Forest land = 16.49 Ha, Therefore CA land= 33 Ha

Cost of Compensatory Afforestation = **Rs. 115.5 Lakhs**

Soil Conservation cost =0.5% of the project cost =  $0.005 \times 4385.67$  Lakh = **Rs 21.928 Lakh**

Cost of Wild life Management Plan= 2% of the project cost= $0.02 \times 4385.67$  Lakh = **Rs 87.713 Lakh**

Total estimated Cost due to diversion of forest (in Rs. Lakhs) = **20,183.77 Lakhs**

  
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## 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  
=  $723 \times 7.783 \times 10^6$  = Rs 56271.09 lakh

### 2. Benefits to economy due to specific project: **Rs 78101.3098 Lakhs**

A. CSR cost = 2 % of Profit =  $0.02 \times \text{Rs } 56271.09 \text{ Lakh}$  = Rs. 1125.4218 Lakh

B. Royalty to the exchequer (15% of Sales Value) = Sale price x 7.783 MT x 15 %  
=  $2687 \times 7.783 \times 1000000 \times 15/100$  = Rs 31369.381 Lakhs

C. District Mining Fund (DMF) = 30 % of Royalty = Rs. 9410.81 Lakhs

D. National Mineral fund = 2 % of Royalty = Rs. 627.387 Lakh

E. Coal Cess/Clean Energy cess =  $\text{Rs } 400/T \times 7.783T \times 1000000$  = Rs. 31132 Lakh

F. Forest transit fee (Rs 57/tonnee) =  $\text{Rs } 57 \times 7.783 \times 1000000$  = 4436.31 Lakh

Total Benefit = A+B+C+D+E+F = Rs. 78101.3098 Lakhs

### 3. No. of population benefitted due to specific project

Direct employment = 836

Indirect Employment = 250

Considering avg. family size 5, then no. of Population benefitted =  $1086 \times 5 = 5430$

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

#### A. For indirect employment generated for= 250 people

Avg. days of Working (as in Jharkhand) = 200 days

Rate of unskilled manpower = Rs. 346/- day

Life of mine = 30 years

Economic benefits due to indirect employment = Rs. 5190 Lakhs

#### B. For direct employment = 836 people (EMS-Rs 5412 /Day)

Economic benefits due to direct employment =  $836 \times 300 \times 30 \times 5412$  = Rs. 4,07,198.88 Lakhs

Economic benefits due to of direct and indirect employment due to project = A+B = **Rs. 412388.88 lakhs**

### 5. Economic benefits due to compensatory afforestation

CA Land =  $16.49 \times 2 = 33 \text{ Ha}$

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 x 33 Ha = 89.367 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 33 Ha for 50 yrs = Rs. 47.93 Lakhs

Total Economic benefits due to compensatory afforestation = (A+B) = **Rs 137.297 Lakhs**

Kuya Colliery ( 16.49 Ha)

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<b>Table 4: Estimation of cost of forest diversion (as per table B of guidelines)</b>		
<b>Sl No</b>	<b>Parameter</b>	<b>Result(in Lakhs)</b>
1	Ecosystem services losses due to proposed forest diversion	202.59
2	Loss of animal husbandry productivity, including loss of fodder	20.259
3	Cost of human resettlement	0
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	19634.49
6	Cost of suffering of oustees	0
7	Habitat Fragmentation cost	101.29
8	Compensatory afforestation and soil & moisture conservation cost	225.14
	<b>Total Loss in lakhs</b>	<b>20183.77</b>

<b>Table 5: Existing guidelines for estimating benefits of forest – diversion in CBA (As per Table C of Guidelines)</b>		
<b>Sl No</b>	<b>Parameters</b>	<b>Result(in Lakhs)</b>
1	Increase in productivity attribute to the specific project	56271.09
2	Benefits to economy due to specific project	78101.3098
3	No of population benefitted due to specific project	5430
4	Economic benefits due to of direct and indirect employment due to project	412388.88
5	Economic benefits due to compensatory afforestation	137.297
6	<b>Total Benefit (2+4+5) in Lakhs</b>	<b>4,90,627.487</b>

**Cost to benefit ratio =  $20183.77/4,90,627.487 = 1:0.041138=24.308$**

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