



COST BENEFIT ANALYSIS REPORT

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



Central Coalfields Limited
(A Miniratna Company)

Magadh OCP Chatra Part (192.36 Ha)

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Project Officer
Magadh OCP
23/7/21
NIRPENDRA NATH
Project Officer
Magadh Project

Introduction:

Three power projects are proposed to be set up by NTPC under the Mega Power Policy of Govt. of India. The three power projects are (i) North Karanpura/Tandwa STPS (2000 MW) (ii) Barh STPS (2000 MW) and (iii) Kahalgaon TPS (1500MW). Out of these three STPS/TPS, North Karanpura/Tandwa STPS and Barh STPS have been linked to North Karanpura Coalfield of CCL, which has huge reserves of power grade coal. The Hon'ble Prime Minister of India has already laid the foundation stone of these mega power projects on 6th March'99.

Two Opencast Projects in N.K. Coalfield have been identified for supplying coal to above two STPS. The opencast projects are Magadh OCP, which is envisaged to feed coal to North Karanpura/Tandwa STPS and Amrapali OCP, which is envisaged to feed coal to Barh STPS. The requirement of power grade coal will be around 10 M.te per annum for each STPS and with these objective in view, the above two OCP's have been prepared for a rated capacity of 12 MTPA each. It is envisaged that these two OCPs will be worked at an operating efficiency of not less than 85%.

Magadh Opencast Project has been identified for a rated capacity of 12.0 MTY for supplying coal to North Karanpura STPS (2000 MW). The proposed mining area is remote and no basic infrastructure like Road, Power, Railway, Water Supply arrangement are available in this project. To develop the area, these facilities are to be made available, which normally take a long period.

Communication:

Name of Project Officer	:	Ashok Kumar
Address	:	Office of Project officer, kundi, Tandwa
Mobile no.	:	
Email Address	:	pomagadhcl@gmail.com

Detail of Household shifting: Nil

The nature of forest land for which application for diversion of forest land to be applied at Magadh OCP Chatra Part (192.36 Ha) falls in Class III MDF forest. As such Rate of NPV comes out as Rs 8,03,000 per ha for 192.36 Ha of the proposed forest land for diversion.

Table 3: Calculation rate for NPV in respect of Amrapali railway siding

Description	Amount in Rs.	Amount in Rs. Lakhs
Total NPV @Rs.803000/Ha for 192.58 Ha of the forest land proposed for diversion	8,03,000*192.36	1544.65
10% NPV Value	15446508	154.46
30% NPV Value	46339524	463.39
50% NPV Value	77232540	772.32

Table 4:**Rate of land as per circle rate**

Name of Village	Circle rate per decimal(in Rs)	Forest Land (in Ha)	Circle rate per Hectare(in Rs)	Circle Rate of the villages (in Rs)
Masilong	3200	45.49	790720	35969852.80
Develgada	2700	1.00	667170	667170
Saradhu	7100	145.87	1754410	255915787
Kundi	3000	0.00	0	0.00
Total				2925.52

Total circle rate of 192.36 Ha= Rs. 2925.52 Lakhs

Other conversion factor

100 decimal = 1 acre

1 Ha = 2.471 Acre = 247.1 Decimal

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Project Officer
Magadh OCP

NIRPENDRA NATH
Project Officer
Magadh Project

CALCULATION AS PER MOEFCC CIRCULAR NO. 7-69/2011-FC(PT.) Ddt. 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 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 192.36 Ha = **Rs. 1544.65 Lakhs**
(Ref Table 3) (for density of forest land as stated in part II of DFO Report)

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 Loss of animal husbandry productivity, including loss of fodder = $0 \times 6 \times 365 \times 60 = \text{Rs. } 0$

10% of NPV = **Rs. 154.46 lakhs** (ref Table 3)

Since 10% of NPV is more

Thus as per guideline

Loss of animal husbandry productivity, including loss of fodder = **Rs 154.46 lakhs**

3. Cost of human resettlement as per R&R Plan =Rs 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 = Rs. 0.00

5. Amount as per Circle rate of adjoining area= **Rs 2925.52 Lakhs**(Ref Table 4)

30% NPV = **Rs. 463.39 Lakhs** (Ref Table 3)

Since circle rate of adjoining area is more than NPV paid therefore as per guideline,

Possession value of forest land diverted= **Rs 2925.52 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. 772.32 Lakhs** (Ref table 3)

8. Compensatory afforestation and soil & moisture conservation cost

Rate of Compensatory afforestation = Rs. 176009/ Ha

Forest land = 192.36 Ha, Therefore CA land= 384.72 Ha

Cost of Compensatory Afforestation = **Rs. 677.14 Lakhs**

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Project Officer
Magadh OCP

23/8/21
NIRPENDRA NATH
Project Officer
Magadh Project

II. Estimating benefits of forest – diversion in CBA

1. Increase in productively attribute due to railway siding assuming the freight difference from rail to road (freight charge for road is about 50% more than rail for about 1000kms distance. Freight charges for rail is Rs 1900 per tonne per 1000 kms (approx), while for road it is about Rs 2600 per tonne per 1000 kms (approx.))

Amount of coal to be dispatched and transported from Magadh OCP to Northern and Western India is around 20 MTPA. Life of the rail project= 30years

= Rs.68,40,000 lakhs

2. Benefits to economy due to specific project

A. CSR cost for the life of the project = 2 % of Profit= Rs 37980 Lakhs

B. Consultancy charge to RITES (@8% approx.) = Rs. 202.56 Lakhs

C. GST on Cost of Works (@ 18%) = Rs 36.36 Lakhs

Total Benefits to the economy= Rs 38218.92 Lakhs

3. No. of population benefitted due to specific project

Direct employment = 260

Indirect Employment = 600

Considering avg. family size 5, then no. of Population benefitted = $860 \times 5 = 4300$

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

- A. For indirect employment generated for= 600 people

Avg. days of Working (as in Jharkhand) = 230 days

Rate of unskilled manpower = Rs. 229/- day

Life of mine = 30 years

Economic benefits due to indirect employment = Rs. 9480.60 Lakhs

- B. For direct employment for= 260

Minimum Wage for Skilled labour= Rs 604/day

Assumed working Days = 330

Life of mine = 30 years

Economic benefits due to direct employment = Rs. 15546.96 Lakhs

Economic benefits due to of direct and indirect employment due to project

=A+B=Rs. 25027.56 lakhs

5. Economic benefits due to compensatory afforestation

CA Land = $192.36 \times 2 = 384.72$ Ha

Class of degraded forest land supposed to change from LDF to MDF

- A. Thus change in benefits (as per NPV) [@ Rs (8.03 – 6.26) lakhs/ha

= 340.47 Lakhs

- B. Economic value of carbon storage

Change in economic value [@ Rs (270040 – 95721)= Rs. 174319 = Rs. 1.74319 [Lakhs] for 60 yrs.

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APPENDRA NATH
Project Officer
Magadh Project

Thus economic value for 50 yrs = Rs.375.72 lakh

Total Economic benefits due to compensatory afforestation = (A+B)= Rs 715.72 Lakhs

Table: 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	1544.65
2	Loss of animal husbandry productivity, including loss of fodder	154.46
3	Cost of human resettlement	NIL
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	Possession value of forest land diverted	2925.52
6	Cost of suffering of oustees	Nil
7	Habitat Fragmentation cost	772.32
8	Compensatory afforestation and soil & moisture conservation cost	677.14
	Total Loss in lakhs	6074.09

Table: 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 productively attribute to the specific project	68.40
2	Benefits to economy due to specific project	38218.92
3	No of population benefitted due to specific project	4300
4	Economic benefits due to of direct and indirect employment due to project	25027.56
5	Economic benefits due to compensatory afforestation	715.72
6	Total man-days of work generated due to indirect employment during life of the project	180(Lakhs)
7	Total	64210.60

Cost to benefit ratio = 6074.09/64210.60= 1:11

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NIRPENDRA NATH
Project Officer
Magadh Project

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Project Officer
Magadh Project
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