

Industrial Growth Center, Siltara  
Raipur (CG) 493111, India  
Tel: +91 771 2216100  
Fax : +91 771 2216198/99  
PAN No.: AAACR6149L  
CIN : L27100MH1973PLC 016617  
www.seml.co.in  
info@seml.co.in

An ISO 9001, ISO 14001 & OHSAS 18001  
Certified Company



## Sarda Energy & Minerals Limited – Sahapur West Coal Mine

Cost Benefit Analysis in respect of diversion of 80.590 Hectares of Forest Land (34.240 Ha. - Reserve Forest, 12.248 Ha – Protected Forest and 34.102 Ha.- Revenue Forest Land.

(As per guidelines dated 01.08.2017 issued by MoEF & CC)

**Table A :- Category of proposals for which Cost Benefit Analysis is applicable at Sahapur West Coal Mine , Tehsil-Pali and Sohagpur, District- Umaria and Shahdol & Forest Division - Umaria and South Shahdol of Madhya Pradesh.**


S. No.	Nature of Proposal	Applicable/Not Applicable	Remarks
1	All categories of proposals involving forest land up to 20 hectares in plains and up to 5 hectares in hills	Not Applicable	Nil
2	Proposal for defense installation purposes and oil prospecting (Prospecting only)	Not Applicable	Nil
3	Habitation, establishment of industrial units, tourist lodges / complex and other building construction	Not Applicable	
4	All other proposals involving forest land more than 20 hectares in plains and more than 5 hectares in hills including roads, transmission lines, minor medium and major irrigation projects, hydel projects, mining activities, railway lines, location specific installation like Micro-wave stations, Auto repeater center, TV towers etc.	Applicable	These are cases where a Cost Benefit Analysis is necessary to determine the forest land due to non-forest use is in the overall public interest.

*[Handwritten signature]*  
30/06/2023



Table B :- Estimation of cost of Forest Diversion

S.No	Parameters	Cost in Cr. Rs.	Remarks
1	Ecosystem services losses due to proposed forest diversion	1.089	Economic value of loss of eco-system services due to diversion of forests shall be the applicable Net Present Value (NPV) amount of the forest land being diverted (80.590 Ha) as prescribed by the MoEF & CC, Govt. of India. Since the maximum surface strain for Sahapur West Coal Block as predicted by IIT Kharagpur through 3-D subsidence prediction model is 9.45 mm/m, 10% of the NPV will be applicable for undisturbed Forest Land i.e. 79.695 Ha and 100% for Forest land under Surface Utilization for Roads i.e. 0.895 Ha hence the amount so determined is calculated as under $(1228590 \times 79.695 \times 0.1 = 97,91,248) +$ $(1228590 \times 0.895 = 10,99,588) =$ 1,08,90,836
2	Loss of Animal Husbandry	0.990	a. As per calculation, loss of animal husbandry productivity including loss of fodder is Rs. 0.898 Crores b. Estimated quantity of fodder/grass = Average production fodder/grasses in MT x Area Applied

  
22/06/2023



			<p>(based on assumption that on closer an area is capable of yielding an average of 2 to 4 MT of grass per Ha (MT) :- <math>3 \text{ MT} \times 80.590 = 241.77 \text{ MT}</math></p> <p>c. Value of fodder = Estimated quantity x Market rate = <math>241.77 \text{ MT} \times 4500 \text{ per MT} = 0.109 \text{ Crores}</math></p> <p>d. Hence, considered 10% of NPV which is maximum</p>
3	Cost of Human Resettlement	NIL	No Human Resettlement is envisaged in the Project.
4	Loss of public facilities and administrative infrastructures (Roads, Buildings, Schools, Dispensaries, Electric lines, Railways etc.) on forest land, which would require forest land if these facilities were diverted due to the project	NIL	No loss to public facilities & administrative infrastructure on Forest Land proposed to be diverted.
5	Possession value of Forest Land diverted	5.641	<p>a. Circle rate of adjoining area in the district as a cost component as possession value of forest land is arrived as Rs 7 lakhs x 80.590 ha = Rs 5.641 crores. (Circle rate of village Shahpur has been considered)</p> <p>b. 30% of environmental costs (NPV) due to</p>

*Handwritten signature and date: 20/10/22*





			<p>loss of Forest (9.901 crores x 0.30 = 2.97 Crores)</p> <p>c. Since, amount determined based on calculation considering the circle rates is high it has been considered towards Possession value of Forest Land diverted.</p>
6	Cost of suffering of Oustees	NIL	No suffering is envisaged being underground Coal Mine.
7	Habitat Fragmentation Cost	0.5445	The cost due to fragmentation has been determined as 50% of the applicable NPV amount as per Standard Industry Practice i.e. Rs. 1.089 Crores x 0.50 = 0.544 Crores.
8	Compensatory afforestation and soil & moisture conservation cost	0.341	Since only 0.895 Ha of Forest Land proposed to be utilized for Road hence requirement of providing CA land will not be applicable and only CA plantation of 10 times of the trees proposed to be felled is to be deposited with State Govt. Only 357 trees say 360 trees are proposed for felling and hence CA of 3600 trees will be required. As per standard practice 2500 trees per Ha are planted under CA and hence CA plantation @ 9,00,000/- Ha for 1.44 Ha is worked out as Rs

*[Handwritten signature]*  
30/6/23



			<p>0.13 Crores.</p> <p>Soil and moisture conservation cost @ 0.5% of the project cost (as per Forest Conservation Division MoEF &amp; CC letter dated 07.06.2022) = 0.211 Crores</p> <p>So the total cost of compensatory afforestation and soil &amp; moisture = Rs. 0.341 Crores.</p>
Total Loss against the proposed forest land diversion = Rs. 8.6055 Crores			

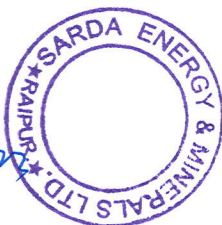
Table – B1- Project Cost Estimates			
S.No	Particulars	Value in Crores	Remarks
1	Capital investment including pre-operative expenses	421.86	
2	R&R Cost	Nil	No human resettlement envisaged in the project.
3	Cost of public facilities including administrative cost	Nil	No disturbance to the public facilities envisaged due to UG mining.
4	Net Present Value (NPV) payable to Forest Deptt for total forest land of 80.185 Ha.	Nil	Cost included in the Forest cost in the Project
5	Cost of Compensatory Afforestation payable to Forest Deptt. The cost of Afforestation on Revenue Land - 80.185 Ha	Nil	Cost included in the part of Forest Cost of the Project
Total Project Cost – 421.86 Crores			

Table C :- Estimation of benefits of Forest Diversion						
Life of the Project		19 years				
Construction Period		1 Year				
S.No	Parameters	Calculation				
1	Increase in productivity	Net Revenue due to Coal				
		S.No	Parameters	Rate (Rs.)	Unit	Amount in




	attribute to the Sahapur West Coal Mine	i	Gross revenue from RoM Coal for life of the Underground Mine (G-7 Average Grade) up to 151 meter depth total reserve is 22.184 MT out of which 10.38 is considered as extractable reserve i.e 10.38 MT @ 3658/ MT (Basic selling Price)	3658	MT	3797.004	
		ii	Tentative operating cost including depreciation, interest on loan payment, tax liability etc. @ (10.38 MT x Rs 2000/ MT)	2000	MT	2076	
		Net Revenue benefits due to Coal (i-ii)					1721.004
		Net Revenue against Royalty, DMF, NMET, Compensation cess, Environmental and Infrastructure cess, Forest Fee etc Rs 1000 per ton					1038
		Net Revenue against Revenue sharing to State Govt @ 951/ton					987.221
2		Net Revenue to State Govt.					2025.221
3	No. of population benefited due to the project	a. Population directly benefitted - 700 b. Population indirectly benefitted- 1000 i) Employment generated on non-forest land in Afforestation programme ii) Local people will have income opportunities in various ancillary work & other activities • Benefits due to direct employment for 700 persons in an average category of semi-					1012.020

Handwritten signature and date 25/6/2022



		skilled for 30 years (700 x 196200x30 years) = 412.020 Crores • Benefits due to indirect employment for 1000 persons for 30 years (1000 x 200000 x 30) = 600 crores	
4	Economic benefits due to compensatory afforestation	Benefits from such Compensatory Afforestation accruing over next 50 years monetized and discounted to the present value has been included as benefit of compensatory afforestation. Cost of CA excluding land has been considered as 880000/ha with a benefit of 10% per annum for 50 years. The value so derived has been discounted to 4% for present value.	41.238
<b>Total Benefits</b>			<b>4799.483</b>

**D. Calculation of Cost Benefit Ratio:-**

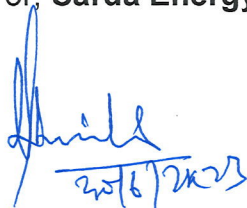
Total Benefits as per Table C:- Rs. 4799.483 Crores

Total Cost as per Table B and B1 = Losses of Forest + Cost of the Project = Rs. 8.606 Crores + Rs. 421.86 Crores = Rs. 430.466 Crores.

Hence, Benefit/Cost Ratio = 11.15

Thus the project gives positive Benefit/Cost Ratio. The monetary returns of the Project are positive over the environmental losses.

For, **Sarda Energy & Minerals Limited**



**SS Shrivastava**  
Vice President – Coal Mines

