

SCHEME FOR
COMPENSATORY AFFORESTATION
OVER DEGRADED RESERVED FOREST (305.59 Ha) OF GOPALPUR
RANGE, UNDER SUNDARGARH FOREST DIVISION OF SUNDARGARH
DISTRICT, ODISHA

AGAINST DIVERSION OF FOREST LAND (i.e. 134.69 Ha)

FOR

KULDA OPEN CAST EXPANSION PROJECT

OF

Mahanadi Coalfields Limited
(A Subsidiary of Coal India Limited)
Jagriti Vihar, Burla, Sambalpur

Prepared by

Divisional Forest Officer,
Sundargarh Forest Division,

CONTENTS

S.No.	Particulars	Page
1	Compensatory Afforestation Scheme	
2	Total Financial outlay of the CA scheme (Annexure-A)	
3	Suitability Certificate from DFO, Sundargarh Division (Annexure-B)	
4	Land Schedule of Forest land involved in diversion (Annexure-C)	
5	Undertaking by User Agency to bear the cost of CA amount (Annexure-D)	
6	DSS Analysis report from DFO, Sundargarh Division (Annexure-E)	
7	DSS Certificate from DFO, Sundargarh Division (Annexure-F)	
8	DGPS map of compensatory afforestation site of Kulda OCP at Pandripani R.F., Sidarmunda R.F., Punjipahar R.F., Panikholia R.F. (Annexure- G)	
9	Topo-sheet showing CA Site of Kulda OCP (Annexure-H)	
10	Cost of ANR plantation and its maintenance as per the one-time cost norm for the year 2023-24 in Annexure-7 (Annexure-I)	
11	Soil Moisture Conservation Measures as per cost norm for the year 2023-24 in Annexure-11 (Annexure-J)	
12	Fencing of Bamboo Twigs & Thorns as per cost norm in Fencing Model – F – I (Annexure-K)	
13	Watering provision to Compensatory Afforestation(CA) plantation as per cost norm in watering Model – W – II (Annexure-L)	

1. INTRODUCTION

Kulda Expansion OCP is located in the north-western part of Ib valley coalfield in Sundargarh District in the state of Odisha. It is situated between latitudes 22°01'02" to 22°03'03" North and Longitudes 83°43'28" to 83°45'35" East and falls mainly in Sundargarh, Jharusguda and Sambalpur districts of Odisha. District headquarter Sundargarh, on State highway-10 (Sambalpur to Rourkela), is at a distance of about 46 Km from the blocks. The Sundargarh(Odisha) – Raigarh(Chattisgarh) all weather road passes through the blocks. The blocks are also well connected by black top road with two different towns of Odisha namely Rourkela at 145Km and Jharsuguda at 75Km. The blocks are around 6 Km south west of Basundhara West Colliery and are connected by part metallic road. The blocks are connected by road to the state capital Bhubaneswar through State Highway-10 and National Highway-42, with a total distance of 450Km. The blocks are well connected with MCL HQ at Sambalpur situated at a distance of about 100 km. The Nearest railhead is Hemgir, on Mumbai-Howrah Broad Gauge of South Eastern Railway at a distance of about 35 km from the blocks. Jharsuguda railway station on Jharsuguda-Sambalpur-Bhubaneswar rail line of East Coast Railway is at a distance of about 75 km. The nearest port at Bay of Bengal is Paradip and situated at a distance of about 600 km. from the block. The Jharsuguda Airport is the nearest airport from the block (Approx. 45 KM).

Kulda OCP is operating since 2007-08. About 120.90 Mt of coal and 86.88 M.Cum of OB have been extracted till 31.03.2022. This project is expansion of existing Kulda Open Cast Mining Project having 218.627 Mt of mineable coal reserve in Kulda, Balinga, Bankibahal, Siarmal(p), Tumulia(p) villages. The Kulda Expansion OCP has got a life span of 11 years. The project extends over an area of 981.705 Ha (incl. existing area) of tenancy land, forest land and Non-Forest land as detailed below:

#	Type of Land	Existing Area (Ha.)	Proposed Area (Ha.)	Total (Ha)
1.	Forest Land	219.371*	134.690	354.061
2.	Govt. Non-Forest Land	320.193	62.670	382.863
3.	Tenancy Land	146.521	98.260	244.781
Total Land		686.085	295.620	981.705

*Out of 227.89 Ha of forest land already diverted for Kulda OCP, 8.52 Ha of forest land has been re-diverted for Basundhara Washery and balance area of 219.371 Ha is existing and another 134.69 Ha is proposed for diversion for Kulda Expansion OCP (Ph-II) of M/s MCL, Basundhara Area.

2. FOREST LAND INVOLVED

Out of the total land requirement of 981.705 Ha, the Kulda OCP involves 354.06 Ha of forest land. Out of this 354.06 Ha of forest land 219.37 Ha (incl. of 15.184Ha of forest safety zone) has already been diverted for Kulda OCP in phase-I, the remaining 134.69Ha of forest land has been proposed for diversion including 9.77 Ha of forest safety zone, which is to be diverted for non-forestry purpose for Kulda OCP in phase –II. The detailed land schedule of Forest land proposed for non-forestry purpose is furnished below:

#	Type of Use	Total (Ha)
1.	Mining Zone	110.92
2.	OB Dump, Embankment, Other infrastructure and Blasting danger zone	13.99
3.	Safety Zone	9.78
Total Land		134.69

3. IDENTIFICATION OF DEGRADED FOREST LAND

As per revised guidelines contained in letter No.11-30/96-FC, dated 10.04.1997 of the Ministry of Forest & Environment a special provision for Central Government Projects has been made for compensatory afforestation by inserting Para 3.2 (viii) (inserted) in the existing guideline. As per revised guideline for diversion of Forest Land under the Forest (Conservation) Act – 1980, compensatory afforestation can be done over degraded forest land twice in extent of forest area being diverted for Central Projects. As per clause 4.7 of the consolidated guidelines for diversion of forest land under the Forest (conservation) Act – 1980 in the matter of mining lease, the forest Area required for safety zone for mining operation should be the part of the forest area proposed for diversion.

Therefore, the present scheme for compensatory afforestation aims at prescribing afforestation program over 286.96 Ha of degraded forest area (twice in extent to the forest area of 134.69 Ha including the area of safety zone i.e.,9.77 ha.) being diverted. Accordingly, a gross area of 305.59Ha (effective area = 286.96 Ha) of degraded forest area has been identified in Pandripani R.F., Panikholia R.F., Sidarmunda R.F., Punjipahad R.F., under

Sundargarh Division (**Annexure-C**). The identified area of degraded forest is in a four patches in the respective Reserved Forest. The DGPS map showing the afforestation site in Pandripani R.F., Panikholia R.F., Sidarmunda R.F., Punjipahad R.F., is furnished herewith as **Annexure – G**. The degraded forest lands identified having found suitable for afforestation; a certificate to that effect is furnished in **Annexure - B**. The compensatory afforestation sites are shown on Topo-sheet enclosed in **Annexure-H**. The DSS Analysis report and Certificate has been attached in **Annexure-E & F**, respectively. The details of quantum of plantation per hectare of CA land and the Forest Range/section under which the plantation shall be carried out is as under:

#	Details of CA Land	Allocated Area (Ha)	Effective Area (Ha)	ANR (Plantation/Ha)	Forest Range	Forest Section	Forest Division
1	Pandripani R.F.	64.10	56.30	600	Gopalpur	Gopalpur	Sundargarh
2	Sidarmunda R.F.	53.56	53.56	400	Gopalpur	Gopalpur	Sundargarh
3	Punjipahar R.F.	131.54	121.00	600	Gopalpur	Duduka	Sundargarh
4	Panikholia R.F.	56.39	56.10	400	Gopalpur	Duduka	Sundargarh

The financial outlay has been calculated taking an average of 500 ANR/Ha in an area of 286.96 (Effective Area) and the total amount for compensatory afforestation shall be disbursed as per the above table to each Forest Range/Division for carrying out the plantation and associated works.

4. ORSAC VERIFICATION OF IDENTIFIED CA SITES AT PANDRIPANI R.F., PANIKHOLIA R.F., SIDARMUNDA R.F., PUNJIPAHAD R.F. (AREA = 305.59 HA)

The CA site identified at **Pandripani R.F., Panikholia R.F., Sidarmunda R.F., Punjipahad R.F** of area 305.59Ha has been verified by the ORSAC after DGPS survey vide their letter vide no. – ORSAC/DGPS-FD/1084/2022/3277(3), dt.–07.09.2022. The DGPS surveyed map certified by ORSAC is attached in **Annexure-G**.

5. DESCRIPTION OF EXISTING VEGETATION

The CA sites identified are having Low Dense Forest (LDF) as well as Moderately Dense Forest (MDF) as categorized by Forest Survey of India. As per the sample tree enumeration carried during site visit, sparse forest growth exists in the areas. Also there are stony patches excluded from planting area. The main species found here are sparse growths of Sal, Asan, Neem, Bija, Bahada, Kendu, Karanja, Char, Mahula, Kusum, Mai, Semuli,

1/4

Tentuli etc. The site is degraded due to repeated biotic interferences like grazing, fire hazard, illicit felling and encroachment. However, whatever regeneration is sprouting do not grow due to trampling effect by domestic cattle of surrounding villages. These species are existing at sparse in deformed shape. Major plant of this area is covered with weeds like *Lantana camara* and *Eupatorium odoratum*.

6. TOPOGRAPHY & SOIL

The identified CA land in Pandripani R.F., Panikholia R.F., Sidarmunda R.F., Punjipahad R.F., is located in the Survey of India; Topo-sheet no. -64 N/12, 64 N/16, 64 O/9, 64 O/13. The topography of the degraded forest land identified for this purpose is plain to undulating, small hilly terrain. The soil is mostly **laterite** & clayey having some portion of **Murom**. The slope varies from moderate to steep. Drainage is good. The thickness of soil varies from very shallow to moderate. The soil is also devoid of humus. At the site, erosion varies from slight to moderate. There are encroachment at some patches which has been removed in the Treatment Plan attached in Vol II and an effective area of 286.96 Ha has been considered for plantation.

7. CLIMATE

The climate of this region is characterized by hot dry summer with well distributed rainfall in South West monsoon season. Cold seasons begin in the month of November and lasts till the end of February. The hot seasons follows thereafter and continues till June. The South-West monsoon starts from mid-June and continues till the end of September. The annual rainfall varies from 1200 to 1500 mm. The months of October and November constitute the post-monsoon seasons. The climate in general is hot, moist and sub-humid. The temperature varies from 15⁰ c to 48⁰ c. May and December are the hottest and coldest months of the year respectively.

8. SPECIAL OBJECTIVES OF MANAGEMENT

- i) To restrict the degradation by reducing the biotic interference to barest minimum and reverse the trend towards the process of restoration of vegetation.
- ii) To develop the Crop composition by providing site-specific silvicultural treatment.
- iii) To facilitate the boosting of natural regeneration and ensure their establishment.

- 115
- iv) To take up appropriate soil moisture conservation measures to improve the soil and moisture regime.
 - v) To improve the bio-diversity of the site.
 - vi) To meet the need of the local villagers with regard to firewood and small timber depending upon the productivity from silvicultural operations like thinning, subsidiary silvicultural operation, climber cutting, cutting of high stumps, double shoot cutting etc.

9. QUANTUM OF WORK TO BE TAKEN UP

The following are the items have been considered for the CA purpose.

- 1. Plantation over the identified degraded forest land.
- 2. Soil Moisture Conservation (SMC) practices as per the MoEF&CC / State specific guidelines
- 3. Watering Provision for the sustainable growth of trees
- 4. Bamboo fencing provision to fence the plantation area for protection from wild animals.

10. NURSERY

- A) A good nursery is the pre-requisite for a successful plantation. All care should be taken to raise healthy and sound seedlings of required size (45 cm height) before they are put to plantation site. Planting of one year and six month old seedling of indigenous species shall be taken up. Nursery Programme must be planned out as per the "Guide-lines" in the plantation manual 1977 so that a good stock of healthy Seedling can be raised. 10% extra seedling is to be raised to cover the shortfall due to casualty in the nursery stage/Plantation Site.
- B) The temporary nursery should be raised near the plantation site as far as practicable.
- C) A seeds should be collected preferably from + trees or purchased from State Siviculturist.
- D) Proper treatment of seeds should be done as per the Plantation manual.
- E) During nursery stage periodical shifting and grading is recommended to avoid roots interlacing/ coiling in to the ground soil.

11. PROTECTION

The important element of successful plantation is Protection. Watchers are to be engaged for the various purpose such as protection, watering, to prevent fire during summer season etc.

12. CONTROL

The nursery journal, plantation journal and other records shall be maintained separately in accordance with the provision of "The Orissa Forest Plantation Manual 1977" indicating the physical and financial achievements. Necessary entries with regard to plantation activities undertaken shall be entered in the journals and shall be produced before the inspecting officers. In case of any eventuality like cyclone, thunderstorm, hail storm etc. if affect the plantation, this should also be noted. It is also necessary to note the distribution of rain fall which not only helps in monitoring the growth of plants at site but also acts as a guideline for the ensuing year's nursery schedule to be formulated.

Protection, measures shall be taken to save the plantation from fire/ grazing incidence. During February / March the cut materials are to be burnt (control burning) under strict supervision. The inspection path shall also have to be laid and weed growths are to be scrapped. Fallen leaves etc. are to be swept regularly.

13. SOIL & WATER CONSERVATION MEASURES

It is indispensable to take up the soil & moisture conservation work. Small gullies are to be plugged by live plants. As the area will be dried out quickly, water conservation measures will be taken up by digging staggered trenches. These trenches will be dug along the contour. The dimensions of the trenches will be 2.5mtr x 0.5mtr x 0.5mtr. and dug out earth will be kept on the lower hill side. Staggered trenches are to be aligned 15mtr. apart along the contour and 7.5mtr. across the contour. In addition to above, leguminous seeds are to be sown in the inter space between the plants. Check dams are proposed to be constructed, out of dry rubbles across the nallas & gullies.

14. PLANTATION

The area will be restocked by planting adequate nos. of seedlings @ 500 nos./Ha (i.e. 1,43,480 nos.) over the identified land for CA purpose. Taking into consideration of soil

117
condition, requirement of local inhabitants and suitability of the site, the following local native species are recommended for plantation.

1. Bamboo- *Dendrocalamus strictus*
2. Neem – *Azadirachta indica*
3. Karanj – *Pongamia pinnata*
4. Amla – *Emblica officinalis*
5. Asan - *Terminalia tomentosa*
6. Jamun – *Syzgium cumini*
7. Khair - *Acacia catechu*
8. Bahada - *Terminalia chebulla*
9. Sissoo – *Dalbergia sissoo* and others.

Following two major operations will be carried out:

A. Regeneration Cleaning:

This operation will be carried out in winter. Following works will be carried out during this operation:

1. For helping the rooted waste to grow better all the unwanted growth including climber and creepers will be cleaned and removed and the useful species will be freed from suppression.
2. The mal formed stems will be coppiced. When there will be more than one shoot, the sound shoot will be singled out.
3. The congested stands of useful species will also be thinned.
4. Where congested bamboo clumps are available, the same will be cleaned.
5. High stumps will be cut flush to the ground

B. Gap Planting:

For filling up the blanks, 500 numbers of seedlings per Hectore is proposed in ANR plantation. The detailed plantation activities & cost has been appended in **Annexure - A**. In the area chosen for plantation work, two stages of weeding are recommended to be carried out. To promote and enhance the growth of the plants, it is necessary to see that, the plants get as much nutrients as possible and that no other plants are competing for space, light and

118

nutrients. Therefore, weeding and soil working must be taken up in a newly created plantation. The period of weeding should be as follows:

(A) 1st weeding and manuring (including casualty replacement) – Last week of July.

(B) 2nd weeding, soil working & manuring – Last week of August/ September

1st weeding is an area weeding and should be taken up after a fortnight of completion of planting. In this weeding, the weeds around the planted seedlings are pulled to a radius of 45 cm and in all other space, they are cut back. During this operation, a dose of NPK fertilizer @ 20 grams per plant will be given to each plant. 2nd weeding is a strip weeding to be taken up in the last week of August/ September. This weeding shall also be carried out along the contour and the cut-out materials will be kept in intermediate lines. In soil, working the soil around each plant is loosened. The soil should be left in clods which will improve soil aeration and help develop root system along with moisture conservation by breaking soil capillary action. The detail plantation cost has been appended in **Annexure - A**.

15. PEOPLE'S PARTICIPATION

The local communities are to be involved for the protection of the plantation. The V.S.S. (Van Surkasha Samiti) is to be formed (if not done earlier) & incentives to be given to the V.S.S. for their active participation in protecting the plantation. Livelihood option and Entry Point Activities are to be taken to improve the socio-economic status of the people living around the forest. For effective protection of area watch and ward shall be provided during the project period (from inception to 10th year) and subsequently the plantation will be looked after by the V.S.S.

16. WATCH AND WARD

Watchers (one watcher for every 10Ha of Plantation) should be engaged from the day of inception of the plantation. Also, extra provision for watch and ward will be considered if applicable towards the successful implementation of scheme and for better protection of plantation.

119

17. TOTAL FINANCIAL OUTLAY AND THE FUNDING AGENCY


M/s Kulda OCP of MCL, Basundhara Area will pay the cost of Compensatory Afforestation amounting to **Rs. 21,91,38,726.00 [Rupees Twenty One Crore, Ninety One Lakh, Thirty Eight Thousand Seven Hundred Twenty Six only]** only on receipt of Demand Notice from D.F.O., Sundargarh Division. However, Kulda OCP has furnished an undertaking to pay any additional amount in case the Wage Rate is escalated between the date of recommendation of this proposal and issue of Stage-II approval issued by MoEF & CC for diversion of forest land. The User Agency has provided an Undertaking to bear the cost of CA amount, which is attached in **Annexure-D**.

18. EXECUTING AGENCY

Divisional Forest Officer, Sundargarh Forest Division.

19. MONITORING AND EVALUATION

Divisional Forest Officer, Sundargarh Forest Division shall monitor and evaluate the scheme periodically.


Divisional Forest Officer,
DIVISION
Sundargarh Forest Division
DIVISION

TOTAL FINANCIAL OUT LAY OF THE PROJECT**A. COST OF AFFORESTATION ACTIVITIES:**

Sl. No	Item of works	Amount (in Rs.)
1	Cost of ANR plantation and its maintenance over 286.96 Ha (as per the one-time cost norm for the year 2023-24_Annexure-7) @ Rs. 150051/- @ 500 plant per Ha (Annexure-I)	4,30,58,634.96
2	Soil Moisture Conservation Measures as per cost norm for the year 2023-24_Annexure-11) (286.96 Ha x 39284) (Annexure-J)	1,12,72,936.64
3	Fencing of Bamboo Twigs & Thorns (286.96 x 250 m = 71740 RMT) @ Rs. 188.00 per RMT (As per cost norm in Fencing Model – F - I) (Annexure-K)	1,34,87,120
4	Watering provision to Compensatory Afforestation(CA) plantation @ Rs. 527321 per Ha over 286.96 Ha (As per cost norm in watering Model – W - II) (Annexure-L)	15,13,20,034.16
	TOTAL	Rs. 21,91,38,725.76 Or 21,91,38,726.00

(Rs. Only)


Divisional Forest Officer
Sundargarh Forest Division

SUITABILITY CERTIFICATE

This is to certify that the Degraded Forest Land identified in the following Reserve Forest Land and as per the effective area mentioned below which has been selected for Compensatory Afforestation against diversion of 134.69 Ha of forest land for Kulda Expansion OCP; Coal Mining Project of M/s MCL are suitable for Afforestation and will be used for the purpose of Compensatory Afforestation:-

Name of Reserve Forest	Legal status	AREA (in Ha)	Effective area in Ha.
Gopalpur Forest Range			
Pandripani R.F.	Reserve Forest /p	64.10	56.30
Sidarmunda R.F.	Reserve Forest /p	53.56	53.56
Punjipahar R.F.	Reserve Forest /p	131.54	121.00
Panikholia R.F.	Reserve Forest /p	56.39	56.10
TOTAL		305.59	286.96



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