SCHEME FOR

COMPENSATORY AFFORESTATION
OVER 15.702 HA. IN NON FOREST LAND
OF
VILLAGE ANKALBIRA IN HEMGIRI TAHASIL,
SUNDERGARH DIST. AND
SUNDARGARH FOREST DIVISION

AGAINST DIVERSION OF 15.701 HA. FOREST LAND
FOR
COAL MINING IN MANOHARPUR COAL MINE
BY
M/S ODISHA COAL & POWER LTD

Prepared by
Divisional Forest Officer
Sundargarh Forest Division

formulated and submitted to the Central Govt.". Therefore, this Scheme is prepared.

As per Para 3.2.(i) of Guideline to F (c) Act, Compensatory Afforestation shall be done over **equivalent area** of non-forest land. Therefore, on receipt of a requisition from A.D.M., Sundergarh, Tahasildar, Hemgiri has identified non-forest land over **15.702 ha** in village- Ankalbira.

As per recent Guideline issued by MoEF & CC Vide their Letter Dt.08.11.2017, Compensatory afforestation in forest areas will be raised to the tune of 1,000 plants per Ha at the minimum.

i) **Map showing the required forest land, boundary of adjoining forest on a 1 : 50,000 Scale map.**

The following maps are submitted with this proposal.

Sl. No.	Particulars	Scale	Plate No.
01	Location Map in Topo Sheet indicating Comp. Affn. area.	1: 50,000	Plate– 1
02	Village Sheet indicating CA land	1: 4,000	Plate- 2

0: . **DETAILS OF THE SITE SELECTED:**

Due to biotic interference, the vegetation of identified patches in Ankalbira village is in degraded condition. This includes bushy growth, pole size crop with scattered matured trees. The growing stock is struggling against the biotic interference like grazing, fire hazard, illicit felling and encroachment. However, whatever regeneration is sprouting do not grow vigorously due invading of domestic cattle of surrounding villages.

a) Crop Composition:

The main species noticed in this area are Sal (*Shorea robusta*), Asan (*Terminalia alata*), Dhaura (*Anogeissus latifolia*), Moi (*Lannea coromandelica*), Kendu (*Diospyros melanoxylon*), Simal (*Bombax ceiba*), Karada (*Cleistanthus*

collinus), Ta igan (*Albizzia lebbek*), Char (*Buchnania lanzan*) and Salia bamboo (*Dendocalam s strictus*). Crop density is <10%. In such areas efforts are necessary to restrict the biotic interference to maximum possible extent for restricting fu ther degradation.

(b) Soil & T pography:

Basica lly this is a valley area. The ANR (Assisted natural Regeneration) with 1,000 pl nts per ha will be mainly raised in the foothill and flat land where he soil is loa ny, skeletal and coarse loamy.

(c) Tempera ure:

The av rage annual temperature varies from 17°C to 41°C the minimum cing in Dece mber- January and the maximum in May-June.

(d) Rain fall

The an nual average rainfall is 920.55 mm. The maximum rainfall is eceived duri g the rainy season from July to August.

e) Climate:

The cli nate of this area is characterized by a hot dry summer and well distributed ra infall by the South-West monsoon. The hot season starts from March and co ntinues till May, which is the hottest month of the year with mean daily maximu n temperature of 41°C and the mean daily minimum temperature of 17° C. The rainy season starts from June to September, July being the month with the heav est shower. Relative humidity is high in the South-West monsoon season. The ra infall is fairly uniform throughout the Division.

03 **SPECIA OBJECTS OF MANAGEMENT:**

i) To restric 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 forest by providing site specific silvicultural treatment.

iii) To facilitate the boosting of natural regeneration and ensure their establishment.

iv) To take up appropriate soil moisture conservation measures to improve the soil and moisture regime.

v) To improve the bio-diversity of this block.

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, louble shoot cutting etc.)

C I. ITEMS OF WORK TO BE TAKEN UP:

To achieve the objective narrated in the foregoing para, the following items of work are mainly prescribed to be taken up.

i) *SURVEY AND DEMARCATION OF BOUNDARY*

The area should be surveyed by GPS in the field with reference to the Cadastral map to ascertain the exact area available for plantation. The boundary of the site shall be demarcated by erecting masonry pillars with **barbed wire fencing** at project cost.

The land schedule of non-forest land identified in Village Ankalbira in Hemgiri Tahasil of Sundargarh district is furnished below:-

Name of Mouza / Village	Khata No.	Plot No.	Kissam	Total area in acres	Area for compensatory Afforestation in Acres	Area for compensatory Afforestation in Ha.
Ankalbira	51	349 (P)	Patra Jungle (AJA)	39.770	33.657	13.621
Ankalbira	49	291 (P)	Bada Jungle (Rakhit)	18.670	5.143	2.081
Total				58.440	38.800	15.702

SU !VEYED DETAILS OF COMPENSATORY AFFORESTATION

GPS CO-ORDINATES OF CA LAND AREA BOUNDARY				
SL. No.	EASTING	NORTHING	LONGITUDE	LATITUDE
1	7 32765.007	2416463.202	83°44'07.44468"	21°49'46.09560"
2	7 32761.024	2416645.854	83°44'07.41912"	21°49'52.03200"
3	7 32757.423	2416827.722	83°44'07.40616"	21°49'57.94248"
4	7 32806.911	2416868.943	83°44'09.15360"	21°49'59.25324"
5	7 32767.635	2416966.849	83°44'07.84752"	21°50'02.45652"
6	7 32902.124	2416962.589	83°44'12.52464"	21°50'02.24052"
7	7 33085.771	2416827.328	83°44'18.83112"	21°49'57.74016"
8	7 33174.608	2416829.725	83°44'21.92388"	21°49'57.76644"
9	7 33170.652	2416634.843	83°44'21.66576"	21°49'51.43764"
10	7 33128.083	2416578.319	83°44'20.14944"	21°49'49.62576"
11	7 33100.185	2416532.763	83°44'19.15044"	21°49'48.16200"
12	7 33095.852	2416464.733	83°44'18.95748"	21°49'45.95448"
13	7 33013.885	2416464.066	83°44'16.10520"	21°49'45.98004"
14	7 33081.009	2416646.353	83°44'18.55356"	21°49'51.86316"
15	7 33026.416	2416670.694	83°44'16.66896"	21°49'52.68576"
16	7 32956.253	2416465.414	83°44'14.10072"	21°49'46.05708"

ii) FENCI G

As the rea is nearer to the habitation and lies adjacent to the agricultural land there is every chances of biotic interference to the plantation area. Therefore : has been proposed to provide Barbed wire Fencing all along the boundary. The total periphery of the patch is 2.1 K.M.

iii)PROTE TION MEASURE:

The ide tified site of Ankalbira village is having very thin forest cover with a few scatt ed trees of miscellaneous species. Due to biotic interference and to save the area from damage, the following protection measures have been prescribed.

(a) ***Watch and ward.***

The Compensatory Afforestation area will have to be protected by engaging watchers for **10 years.**

PLANTATION:

The area will be stocked by way of raising plantations @ 1,000 plants per hectare in AFNR model with the following species

1. *Terminalia alata* (Asan)
2. *Pongamia pinata* (Karanja)
3. *Simaruba glauca* (Simaruba) on border of the plantation area.
4. *Azadiracta indica* (Neem)
5. *Pterocarpus marsupium* (Bija)
6. *Emblica officinalis* (Amla)
7. *Terminalia belerica* (Bahada)
8. *Terminlia chebula* (Harida)
9. *Dalbergia latifolia* (Pahadi sissoo)
10. *Cassia siamea* (Chakunda)
11. *Gmelina arborea* (Gambhar)
12. *Mullaca latifolia* (Mohula)

Different operations those will be taken up for plantation are as follows :-.

i) Raising of nursery:

Seedlings required for this plantation shall be raised in an in-situ nursery in close proximity of the planting site and perennial water sources. Nursery work will start one year in advance to the year of plantation, so that one year old seedlings will be available for plantation; Seeds shall be collected from plus/ selected trees and should be treated before dibbling. Poly-pot seedlings should be raised with 20% extra than the actual requirement to compensate the casualties during nursery stage as well as planting time. Standard nursery practices will be followed for raising such nursery.

ii) Alignment and pitting:

Alignment and piting will be taken up in the month of November-December and pits of size 30 cm x 30 cm x 30 Cm will be dug maintaining a spacing of 2.5 mtr x 2.5 mtr and dug up earth will be piled preferably on the northern aspect.

iii) Actual planting:

The seedlings will be planted in the dugout pits with initial dose of manure. Plantation should be taken up after first regular shower of monsoon and should be completed by the end of July. Species should be planted as per the suitability of the soil condition. NPK fertilizer @ 30gms per plant should be given as basal dosage. Anti-termite insecticide should also be applied to each pit while planting. Casualties if any noticed should be replaced with the excess seedling raised for the purpose. During second year also casualty replacement will be done for which seedling shall be raised.

iv) Weeding, Soil working & manuring:

For establishment and better growth of the planted seedling, circular weeding, soil working and manuring are necessary. It is prescribed that two weedings; soil working and manuring will be done during the first year and second year of plantation and one weeding and soil working during third year. During the first year and second year first weeding and manuring shall be carried out during August-September and the second one during October November. First weeding shall be an entire area weeding (scraping) and the second will be of strip weeding along the contour. The weeding of third year will be a strip weeding which will be carried out during August.

Each weeding will be followed by a soil working around each plant at a radius of 0.5 mtr and manuring of each plant will be done @ 30 grms of NPK per plant.

v) Application of insecticides.

The plantation site after planting good healthy seedling may cause influx of insects, which usually damage the roots of the plants. To get rid of such insects attack application of insecticides will be taken up in required doses while planting. Spraying of insecticides shall be done preferably in a sunny day in the afternoon, if required.

It was told by Late H.F.Mooney, Conservator of Forests that every visit of Forest Officer to plantation site will add manure to the plantation. Therefore, to make this Afforestation scheme successful, intensive Inspection of the plantation by forest field staff and the Officers at the division level will be organized. Moreover for frequent monitoring &

evaluation proper infrastructure facility shall have to be made in the scheme.

06. **CONTROL:**

The nursery journal, the plantation journal and other records shall be maintained in accordance with the provision of "The Odisha 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. The date of inspection and comments of the visitor will also find place in the journal.

07. **EXECUTIVE AGENCY:**

The Divisional Forest Officer, Sundargarh Forest Division through his staff will execute the scheme as per fund to be provided by the user agency

08. **FUNDING AGENCY:**

Odisha Coal & Power Ltd. will deposit the fund to DFO, Sundargarh in CAMPA be e-payment after approval of the Scheme by the Addl.PCCF, Forest Diversion and Nodal Officer, F C Act and on receipt of Demand Notice from DFO, Sundargarh Division.

09. **TOTAL FINANCIAL OUTLAY FOR THE SCHEME:**

The total financial outlay of the scheme is ***Rs.54,16,244/-***

Divisional Forest Officer
Sundargarh Division

COST NORM FOR ANR PLANATION @ 1000 PLANTS PER HECTARE FOR SITE IDENTIFIED IN VILLAGE ANKALBIRA OVER AN AREA OF 15.702 HA.

Sl. NO	ITEMS OF WORK	Preferable period of Execution	Person Days	Labour cost@Rs.280.0/-per day	Material Cost(Rs)	Total cost(Rs)
1	2	3	4	5	6	7
	0th year (Advance work) pre-planting operation					
1	Survey, demarcation and pillar posting	Nov/Dec	2	560	0	560
2	Site preparation	Nov/Dec	8	2240	0	2240
3	Alignment and marking of pits	Jan/Feb	2	560	0	560
4	Digging of pits (30 cm cube)	Feb/Mar	25	7000	0	7000
5	Nursery cost (6 months old seedling)part@ Rs.12.43/-per seedling (Rs.8.67 in 0th year +Rs.3.76 in 1st year) for 1100 seedlings(1000+100)	Jan-Mar	27.5	7700	1837	9537
	Total		64.5	18060	1837	19897
6	Monitoring and Supervision charge 5% of the total cost					994.85
	Grand Total		64.5	18060	1837	20892
	1st year/planting year					
1.	Nursery cost(6 months old seedling) balance@ Rs.3.38 for 1100 seedlings.	Apr-Jul	13	3640.0	496	4136
2.	Fencing for an average of 250 meters/ha @ Rs. 76.80/- per meter for bamboo twigs and bamboo thorn fencing	Jan/Feb	38	10640	8560	19200
3.	Carriage & planting, casually replacement and application of insecticides, manure etc.	Jul/Aug	13	3640	0	3640
4.	Cost of insecticide and fertilizer (a) NPK@50gms/plant as basal dose=50kg@Rs.24/-per kg=Rs.1200.00. (b)Urea @70gms/plant in two subsecquent doses@Rs.6/- per kg=Rs.420/- (c) Granular insecticide(Themet, Forate etc.)@5 gms/plant@ Rs.80/-per kg=Rs.400/-		0	0	2020	2020
5.	1st weeding(complete weeding)	Aug/Sep	5	1400	0	1400
6.	Mounding urea 5 gm	Aug/Sep	4	1120	0	1120
7.	2nd weeding(complete weeding)	Sep/Oct	4	1120		1120

	Soil working (50cms.radius around plants)&manuring urea 35gms per plant	Sep/Oct	5	1400	0	1400
	soil conservation measures in the form of staggered trenches of size 2m x 0.5m x0.5m@ 80 nos. per ha	Sep/Oct	10	2800	0	2800
	Fire line tracing & Inspection path	Feb/Mar	3	840	0	840
	watch & ward	Aug-Mar	7	1960	0	1960
	Total		102	28560	11076	39636
	Monitoring and Supervision charge 5% of the total cost					1981.80
	Total		102	28560	11076	**41618.00**

2nd year Maintenance

1	Casualty replacement(10%) with cursery cost	Jul/Aug	2.5	700	1036	1736
2	Weeding(complete weeding)	Sep/Oct	4	1120	0	1120
3	Repair and maintenance of Bamboo fence including material cost	Sep/Oct	20	5600	5680	10680
4	Cost of fertilizer(NPK@ 70 gms/plant for 1000 plants@Rs.24/-per kg & insecticide@500gms/plant for 100 plants 500gms@Rs.8/- per Kg)		0	0	1720	1720
5	soil working (50 cms. Radius around plants)	Oct/Nov	5	1400	0	1400
6	Application of fertilizer & insecticide	Sep/Oct	2.5	700	0	700
7	Fire line tracing(2 m. wide fire line over 400 m long	Feb/Mar	3	840	0	840
8	watch & ward	Apr-Mar	15	4200	0	4200
	Total		52	14560	4836	22396
9	Monitoring and Supervision charge 5% of the total cost					1119.80
	Total		52	14560	4836	23516

3rd year Maintenance

1	weeding and application of fertilizer	Aug/Sep	5	1400	0	1400
2	Cost of fertilizer(NPK@ 50gms/plant)@Rs.24/-per kg		0	0	1200	1200
3	Repair and maintenance of Bamboo fence including material cost	Sep/Oct	20	5600	1000	6600
4	soil working(50cms.radius around plants)& application of fertilizer	Oct./Nov	5	1400	0	1400

	Total		18	5040	0	5040
3	Monitoring and Supervision charge 5% of the total cost					252
	Grand Total		18	5040	0	5292
	8th year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length) & cultural operation	Feb/Mar	3	840	0	840
2	watch & ward	Apr-Mar	15	4200	0	4200
	Total		18	5040	0	5040
3	Monitoring and Supervision charge 5% of the total cost					252
	Grand Total		18	5040	0	5292
	9th year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length) & cultural operation	Feb/Mar	3	840	0	840
2	watch & ward	Apr-Mar	15	4200	0	4200
	Total		18	5040	0	5040
3	Monitoring and Supervision charge 5% of the total cost					252
	Grand Total		18	5040	0	5292
	10th year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length) & cultural operation	Feb/Mar	3	840	0	840
2	watch & ward	Apr-Mar	15	4200	0	4200
	Total		18	5040	0	5040
3	Monitoring and Supervision charge 5% of the total cost					252
	Grand Total		18	5040	0	5292

Abstract

Year	Person Days	Labour (Rs)	Material (Rs)	Monitoring & Supervision charge 5% of the total cost	Total Cost (Rs)
0th Year	64.5	18060	1837	905	20802
1st Year	102	28560	11076	1582	41618
2nd Year	52	14560	7836	1120	23516
3rd Year	48	13440	2200	782	16422
4th Year	18	5040	0	252	5292
5th Year	18	5040	0	252	5292
6th Year	18	5040	0	252	5292
7th Year	18	5040	0	252	5292
8th Year	18	5040	0	252	5292
9th Year	18	5040	0	252	5292
10th Year	18	5040	0	252	5292
TOTAL	**314.5**	**109900**	**22949**	**6642**	**139491**

Abstract of Plantation Cost Only

Rs. 1,39,491.00 per Ha x 15.71 Ha = Rs.21,91,403.61 or **Rs. 21,91,404.00**

. Additional 25% on plantation cost for Soil Moisture Conservation like Staggered Trenches and LBCD (Loose Boulder Chek Dam) **Rs. 5,47,851.00**

. 20% plantation cost for weed clearance and extra Watch and ward **Rs. 4,38,281.00**

Sub Total ... ... Rs. 31,77,536.00

(Rupees Thirty one lakh Seventy seven thousand Five hundred thirty six) Only

ESTIMATE FOR BARBED WIRE FENCING

1 02 p.y barbs : wire (5 Rmt per kg)

7 Straight S rand X 1000 Mt =7000Mt

Mt 2 Diagora Strand = 2X $\sqrt{(6.5')^2 + (8.2')^2}$ = 2X10.50ft
21.00 ftX400 nos=8400ft or =2560 Mt

=9560 Mt

Requirement of Barbed wire per Km Rs.1,52,960.00

Cost per KM 9560/5=1912 kg @Rs.80/kg

2 Construction of RCC pillars of size-
Length-8ft, bottom width 6"X6", Top width -4"X4"
Reinforced with 6mm rods with proper curing
{8'X 6"+4"/2 } X 6"+4/2=1.34 cft or 0.038 cum

i) Cost of C.C Work 1:2:4=0.038 cum @**5262.57**/cum =199.98

ii) Cost of rod including cutting, bending & binding
0.038X0.9 qtl =0.0342 qtl@ Rs. **10, 595, 80**/qtl. =362.38

iii) Contingency (15%) including =81.05
Curing, Stacking, provision of hooks etc.

Rs. 643.41 or
Rs. 644

Requirement of Pillars per KM-

Spacing =2.5 mt X2.5 mt =400

Requirement =1000 mt/2.5 mt =80

Strut pillar in every 10th pillar = (400/10)X2
480 Nos.

Cost of Pillar per Kilometer = 480@644/- Rs.3,09,120.00/-

3 Fitting fixing of RCC pillars in position with hbg metal (4cm) in C.M (1:4:8)

i. Digging of pits 1.5'X1.5'X1.5'=3.375 cft/pit
for 480 pits, 480X3. 375=1620 cft or 45.86 cum@ Rs. =5521.54
12,040/100 cum

ii. Fixing of pillars with C.C using metals in C.M 1:4:8

Pit Size - 1.5' X1.5'X1.5' =3.375

Deduct 1/3rd of butt of pillar i.e 3.375/3 = (-) 1.125 cft

Total C.C work per pillar

2. 25 cft

	For 480 pillars = 480 x 2.25= 1080 cft or 30.577 cum @	Rs.3629.46/ cum	Rs.1,10,978.00
4	Labour of straightening the barbed wire and fixing & clipping with pillers 70 M.d per Km @ 280/-		Rs. 19,600.00
5	Carriage of barbed wire & piller to worksite @ Rs. 1000/- t. And cost of loading and unloading within 5 km distance Approximately 10 tld @800/tld		= Rs. 18,000.00
6	Provision of one Iron Gate of Size (4' x 5') on I.S		Rs. 7,500.00
	Total		= Rs. 6, 23,680.00
	Labour cess1 %		= Rs. 6,237.003
	Expenditure per km of Barbed wire fencing		**Rs. 6,29,917.00**
	Or say Rs. 629.91/- or Rs. 630/- per meter		
7	Expenditure towards maintenance for 3 year (3rd, 6th & 9th)@ 2% of cost per rkm = 3 x2% x Rs. 6, 29,917/-		= Rs 37,795.00
	Expenditure per 1 km of barbed wire fencing including Maintenance		= Rs. 6,67,712.0

So expenditure per running meter for fencing = 667.71/meter or say Rs. 668/- meter (Rupees six hundred sixty eight) only/-

The total periphery of the proposed plantation area comes to1873.342 m or 2.0 K.M. (2000 m) Total expenditure for 2000m x Rs. 668.00 = Rs. 13.36 lac.

(Rupees Thirteen lac and thirty six thousand only)

FINANCIAL OUTLAY OF THE SCHEME

SL NO	DESCRIPTION	AMOUNT (RS.)
1.	Cost of ANR Plantation over an area of 15.71 Ha.	21,91,404.00
2.	Cost of SMC Activities @ 25% of Plantation cost	5,47,851.00
3.	Weed clearance and extra Watch and ward @ 20% of Plantation cost	4,38,281.00
4.	Cost of barbed wire fencing over 2 K.M. @ Rs.6.68 lac per K.M.	13,36,000.00
	Sub Total	45,13,536.00
	Escalation (20%)	9,02,708.00
	Total	**54,16,244.00**

Rupees Fifty four Lakhs Sixteen thousand two hundred and forty four Only

Divisional Project Officer
Sundarban Division