

CHECK LIST SERIAL NUMBER: 18


COMPENSATORY AFFORESTATION SCHEME OVER AN AREA OF 3.1 Ha. FOREST LAND IN BARABA RF OF PHULBANI FOREST DIVISION

(FOR Diversion of 1.518 ha of Forest land for
construction of Ranaba-Badagarh PMGSY road under
Package No.OR-25-320 in Kandhamal District)

Plantation Model:

Artificial Regeneration over 3.1 ha @1000 seedlings per ha.

Submitted


Executive Engineer
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Countersigned & forwarded


Divisional Forest Officer,
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SCHEME FOR COMPENSATORY AFFORESTATION

1. Introduction:

Construction of Ranaba-Badagarh PMGSY road in Kandhamal District in the State of Odisha involves diversion of 1.518 ha of Forest land. This project is being executed by the Rural Works Division, Phulbani. As it is a Central Government Project, Degraded Forest Land under the administrative control of Forest Department is required to be provided for Compensatory Afforestation purpose against diversion of 1.518 ha. The required CA Land is $1.518 \text{ ha} \times 2 = 3.036 \text{ ha}$ or 3.1 ha. The said 3.1 ha degraded forest land has been identified in Baraba RF of Phulbani Division. This scheme is prepared for degraded Forest land identified in Phulbani Division over an area of 3.1 ha.

2. Details of Degraded Forest Land for Compensatory Afforestation:

Sl. No.	Name of Forest block	Comp. No	Range	Extent of area identified in ha
1	Baraba RF		Karada	3.1 ha.

The Boundary Point Latitude / Longitude of Baraba RF is on the DGPS map and reproduced below.

DGPS Coordinate of Baraba RF			
Sl. No.	Point ID	Longitude	Latitude
1	PO-1	84° 22' 3.967"	19° 51' 36.644"
2	PO-2	84° 22' 4.599"	19° 51' 34.295"
3	PO-3	84° 22' 5.325"	19° 51' 33.027"
4	PO-4	84° 22' 9.740"	19° 51' 29.349"
5	PO-5	84° 22' 13.626"	19° 51' 33.078"
6	PO-6	84° 22' 9.151"	19° 51' 37.397"
7	PO-7	84° 22' 6.571"	19° 51' 37.367"

The Site is located in survey of India Toposheet No. **E45A05**. The Topomap and DGPS map are enclosed as Plate No.-I & II

2. Description of Area

Soil: The soil is stony with loamy soil in pockets / patches. Organic content is quite appreciable. Due to Podu Cultivation in Baraba RF and now abandoned pocket soil rich in organic content is observed in patches. Some area is affected by soil erosion.

Topography: The topography is hilly with variable slope ranging from 10° to 30°.

Climate: The climate is tropical and average rainfall is 1300 mm to 1400mm with hot climate in most of the period of a year. The average summer temperature is about 35°C and minimum temperature in winter falls below 15°C

Vegetation:

The identified patch was under podu cultivation 4 to 5 years back. The area is devoid of trees except Mai, Salai, Mahila. After the podu cultivators left the area as per podu practices, bushes of Sal, Kendu, Kasi have come up. Due to grazing, the seedlings are not established at present. The area is infested with Eupatorium and invasion to this podu abandoned area is feared. Besides shifting cultivation, grazing and browsing by cattle and fire in Summer season has made the area open forest.

3. Plantation Model:

The total area identified in this site is 3.1 ha .The area will be planted up in AR Plantation Mode @ 1000 plants per ha as per approved cost norm @Rs311.00 per MD.

4. Abstract of Plantation model:

Sl no	Description	Model
	Baraba RF	
1	AR plantation	3.1 ha.
2	Spacing	3m X 3m
3	No of saplings to be planted per ha	1000
4	Total seedlings Proposed for planting	1000X3.1 ha.=3100
5	Vegetative Fencing & Barbed wire fencing	Around 822mt on outer boundary only
6	Add. Soil & Moisture conservation	As required

5. Technical details:-

- (a) The plantation will be taken up in AR plantation model @1000 plants/ ha. in Baraba RF.
- b) **Spacing:** The plant density proposed for planting is @1000 plants per ha. The spacing is 3m X 3m which is generally adopted in this tract. It is suggested to have the line of planting along the contour and plant to plant in adjacent row is staggered.

This will reduce the runoff and encourage percolation of water and enrichment of vegetation.

c) **Choice of Species:** The suitable species for the site as indicated from the present vegetation is preferable drought hardy and pioneer species as per plant succession. Mostly indigenous species will be planted up. The species suggested are

1. *Dalbergia latifolia* (Pahadisiso)
2. *Gmelina arborea* (Gambhari)
3. *Mangifera indica* (Aamba)
4. *Phyllanthus emblica* (Anla)
5. *Syzygiumcumini* (Jamun)
6. *Artocarpus heterophyllus* (Jackfruit)
7. *Annona squamosa* (Custard apple)
8. *Albizzia lebbek* (Sirisa)
9. *Azadirachta india* (Neem)
10. *Dendrocalamusstrictus*. (Baunsha)

(NB: All seedlings will be of 18m old as per guidelines issued by the PCCF, Odisha.)

d) Plantation Method.

d(i) Alignment, stacking and Pitting.

Alignment and stacking will be taken up in the month of January. Pits of size 45 cm x 45cm x 45cm are to be dugout with a spacing of 3mt x 3mt @1000 plants per hectare

d(ii) Planting

Plantation will be done after first regular shower of monsoon and to be completed within a week. Basal dose of NPK/DAP fertilizer @100gm/plant in 2 doses per plant to be given. Utmost care is to be taken to apply insecticides @5gm per pit. Casualty replacement is to be taken up during 1st year of plantation just after one month of planting. 10% causality replacement is also suggested during 2nd Year.

d(iii) Weeding, Soil working and Application of Fertilizer.

Post planting operation is most vital in success of any planting programme. It is proposed to carry out two weeding during first year. Preferable Strip Weeding along the contour will be taken up. One weeding and soil working has to be done in second year and third year of

plantation. Application of 50gms of NPK/DAP to be added to the soil per plant at the time of soil working during rains during 1st & 2nd year of plantation. During second weeding, provision of Half Moon trench is suggested. This will also be repeated during 2nd year also. The design is furnished below.

d(iv) Application of insecticide:

To prevent infestation of planted seedlings with diseases due to influx of insects and pests into the area, it is required to apply insecticides like Phorate at the time of planting. Foliar spraying of insecticide may be done if badly necessary.

d(v) Fire line tracing and maintenance:

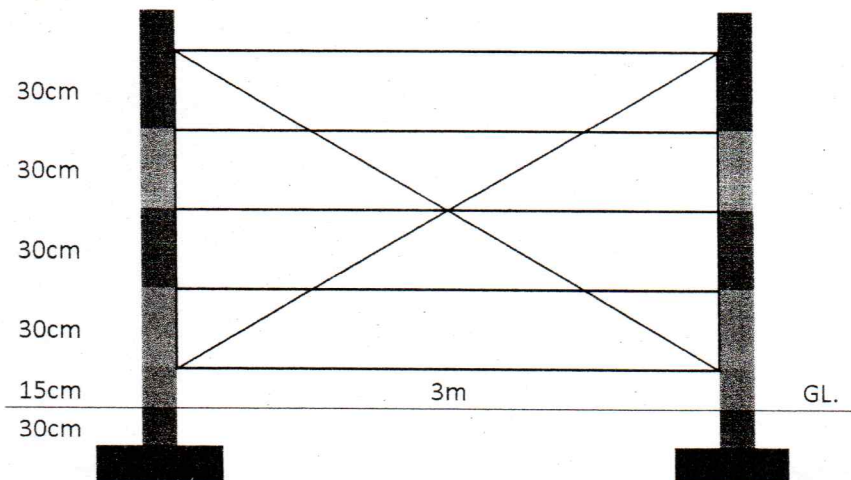
Tender seedlings planted are subject to damage by ground fire. It is required to protect the plantation and forest growth from fire hazard by tracing of fire lines. Boundary of the plantation and several internal lines need to be scrapped to a width of 2mtr during February-March. The cut back materials and dry leaves along with fire lines should be separated and dumped in pits outside the plantation area.

d(vi) Fencing.

Barbed wire fencing is suggested along the plantations and outside interface i.e. boundary of plantation. The length of periphery of the plantation site is 822mt which is required to be fenced completed.

Description of Barbed Wire Fencing.

It is suggested to put T shaped pillars at an interval of 2m. The length of such pillar is 2.10 m. (1.5m above the ground & 0.60m below the ground.) Size:15cmx10cm. The Lower bar of inverted "T" is of 30cm including the width of the pillar. There will be 5 strands of two ply barbed wire at a height of 15cm, 45cm, 75cm, 105cm, and 135cm. Two strands will be put diagonally (connecting 15cm point to 135 cm point & 135cm point to 15cm point)



The Cost norm for barbed wire fencing is at Annexure- II.

d(vii) Watch and ward:

Watch and ward is necessary to protect the area from grazing, fire accident and other biotic interference. Necessary provisions have been made in the approved cost norm.

e) Soil and Moisture Conservation Works:

In order to enhance soil moisture, check run off and arrest carrying of silt in the flow water it is required to have staggered trenches (Size 2m longx0.50 m width X0.5 m Deep) along the contour. Line to line interval is to be kept at 4m or as required considering the degree of slope of the land.

Besides the provisions available in the cost norm, as the tract is hilly and it is suggested to have Loose Boulder Check Dam on the dry seasonal nalla to check soil erosion and enhance ground water recharge. It is also suggested to have two row of contour bonding at an interval of 20m.

f) Protection (Fencing, Watch man, People's Participation etc.):

In order to provide protection to plantation so raised, Provision for Fencing, watchman has been made and discussed and elaborated in foregoing paragraphs. In respect of people's participation, it is proposed to constitute and strengthen the VSS in near by two villages. 15% of the plantation cost is proposed for EPA

g) Proposed Monitoring Mechanism:

Implementation of the planting program will be monitored by the DFO, Phulbani and RCCF, Berhampur periodically. As other technical facilities / tools are now available at the hands of supervising authority and KML file along with Coordinates available it can be easily monitored from Satellite imagery / Google earth maps.

h) Any other information:

The villagers are mostly tribals and they have a liking for fruit bearing trees i.e. Mango, Jackfruit, Jamun and custard apple. It should be our endeavor to plant more fruit bearing trees (about 15%) to encourage their participation. Periodical interaction with VSS will go a long way in its success.

Compensatory Afforestation Cost Estimate

1. For Baraba PRF

For Baraba RF @ Rs 311/- per MD Area 3.1 Hectare					
Sl No	Description	Unit	Rate	Quantum	Total amount in Rs
1	AR plantation (cost of plantation & 10 years maintenance)	Ha	183384	3.1	5,68,490
2	Barbed wire Fencing	Rmt	715/-per mt	822 m	5,87,730
3	Add. Soil & Moisture Conservation Measure				
(a)	Percolation Pit 64 nos per ha @22 MD/ ha	ha	6842/- per ha.	3.1	21,210
(b)	LBCD		20000/-	8	1,60,000
(c)	Contour bonding	RKM	7.00 L	1	7,00,000
4	S. Total				20,37,430
5	EPA 15% of (A+B)				3,05,615
6	Total				23,43,045
7	Add Escalation of labour rate & material cost (20%) on item No-6				4,68,609
8	Grand Total				28,11,654

Total Project Cost under Compensatory Afforestation comes to Rs 28,11,654 or say 28.12 Lakh. (Rupees Twenty eight lakh twelve thousand) only.

Encl: 1. Topo sheet showing area for CA land, (Plate-I)

DGPS map: Plate no II

Cost norm for AR Plantation @1000 seedlings/ha for compensatory afforestation.

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Annexure-I

**COST NORM FOR BLOCK PLANTATION @ 1000 PLANTS PER HECTARE
WAGE RATE @ 311/- PER DAY(NAP)**

Sl. No.	Items of work	Period of Execution	Person days	Labour cost in Rs.	Material cost in Rs.	Total cost in Rs.
1	2	3	4	5	6	7
0 TH YEAR (ADVANCE WORK) PRE PLANTING OPERATION						
1	Survey, Demarcation and pillar posting	Nov/Dec	2	622	0	622
2	Site preparation	Nov/Dec	8	2488	0	2488
3	Alignment and stacking of pits	Jan/Feb	2	622	0	622
4	Digging of pits (30cm cube)	Feb/Mar	25	7775	0	7775
	Total		37	11507	0	11507
6	Monitoring and supervision charge 5% of the total cost					575
	Grand total		37	11507	0	12082
1st YEAR /PLANTING YEAR						
1	Nursery cost for 1100 seedlings @Rs.38/- per seedling.	Apr-Jul			41800	41800
2	Fencing for an average of 250 meters /ha @ Rs.76.80/- per meter for bamboo twigs and bambo thorn fencing	Jan/Feb	38	11818	8560	20378
3	Carraige and planting, casualty replacement and application of insecticides, manure etc	Jul/Aug	13	4043	0	4043
4	Cost of insecticide and fertilizer (a) NPK@50gm/plant as basal dose=50kg @Rs.24/- per kg=Rs.1200.00 (b) Urea @70gms/plant in two subsequent dose @ Rs.6/- per kg=Rs.420/- (c) Granular insecticid(Themet, Forat etc) @5gm/plant @Rs.80/- per kg= Rs.400/-		0	0	2020	2020
5	1st weeding (complete weeding)	Aug/Sep	5	1555	0	1555
6	Manuring Urea 35 gm	Aug/Sep	4	1244	0	1244
7	2nd weeding (complete weeding)	Sep/Oct	4	1244	0	1244
8	Soil working (50cms Radius around plants) & manuring urea 35gm per plant	Sep/Oct	5	1555	0	1555
9	Soil conservatio measures in the form of straggerd trenches of size 2mX0.5mX0.5m @30 nos per ha.	Sep/Oct	10	3110	0	3110
10	Fireline tracing and inspection path	Feb/Mar	3	933	0	933

11	Watch and Ward	Aug-Mar	7	2177	0	2177
	Total		89	27679	52380	80059
12	Monitoring and supervision charge 5% of the total cost					4003
	Grand total		89	27679	52380	84062
2ND YEAR MAINTENANCE						
1	Casualty replacement (10%) with Nursery cost	Jul/Aug	2.5	777.5	3800	4577.5
2	Weeding (complete weeding)	Sep/Oct	4	1244		1244
3	Repair and maintenance of bamboo fence including material cost	Sep/Oct	20	6220	5080	11300
4	Cost of fertilizer (NPK@70gm plant for 1000 plants) (Rs.24/- per kg & insecticide @5gm/plant for 100 plants 500gms@Rs.80/- per kg)		0	0	1720	1720
5	Soil working (50cms Radius around plants)	Oct/Nov	5	1555	0	1555
6	Application of fertilizer and insecticide	Sep/Oct	2.5	777.5	0	777.5
7	Fireline tracing (2m wide fire line over 400 m long)	Feb/Mar	3	933	0	933
8	Watch and Ward	Apr-Mar	15	4665	0	4665
	Total		52	16172	10600	26772
9	Monitoring and supervision charge 5% of the total cost					1338
	Grand total		52	16172	10600	28110
3RD YEAR MAINTENANCE						
1	Weeding and application of fertilizer	Aug/Sep	5	1555	0	1555
2	Cost of fertilizer (NPK@50gm/ plant)@ Rs.24/- per kg		0	0	1200	1200
3	Repair and maintenance of bamboo fence including material cost	Sep/Oct	20	6220	1000	7220
4	Soil working(50cm radius around plants) and application of fertilizer	Oct/Nov	5	1555	0	1555
5	Fireline tracing (2m wide fireline over 400 m length) & cultural operation	Feb/Mar	3	933	0	933
6	Watch and Ward	Apr-Mar	15	4665	0	4665
	Total		48	14928	2200	17128
7	Monitoring and supervision charge 5% of the total cost					856
	Grand total		48	14928	2200	17984

4TH YEAR MAINTENANCE						
1	Fireline tracing (2m wide fireline over 400 m length) & cultural operation	Feb/Mar	3	933	0	933
2	Watch and Ward	Apr-Mar	15	4665	0	4665
	Total		18	5598	0	5598
3	Monitoring and supervision charge 5% of the total cost					280
	Grand total		18	5598	0	5878
5TH YEAR MAINTENANCE						
1	Fireline tracing (2m wide fireline over 400 m length) & cultural operation	Feb/Mar	3	933	0	933
2	Watch and Ward	Apr-Mar	15	4665	0	4665
	Total		18	5598	0	5598
3	Monitoring and supervision charge 5% of the total cost					280
	Grand total		18	5598	0	5878
6TH YEAR MAINTENANCE						
1	Fireline tracing (2m wide fireline over 400 m length) & cultural operation	Feb/Mar	3	933	0	933
2	Watch and Ward	Apr-Mar	15	4665	0	4665
	Total		18	5598	0	5598
3	Monitoring and supervision charge 5% of the total cost					280
	Grand total		18	5598	0	5878
7TH YEAR MAINTENANCE						
1	Fireline tracing (2m wide fireline over 400 m length) & cultural operation	Feb/Mar	3	933	0	933
2	Watch and Ward	Apr-Mar	15	4665	0	4665
	Total		18	5598	0	5598
3	Monitoring and supervision charge 5% of the total cost					280
	Grand total		18	5598	0	5878
8TH YEAR MAINTENANCE						
1	Fireline tracing (2m wide fireline over 400 m length) & cultural operation	Feb/Mar	3	933	0	933
2	Watch and Ward	Apr-Mar	15	4665	0	4665
	Total		18	5598	0	5598
3	Monitoring and supervision charge 5% of the total cost					280
	Grand total		18	5598	0	5878

9TH YEAR MAINTENANCE						
1	Fireline tracing (2m wide fireline over 400 m length) & cultural operation	Feb/Mar	3	933	0	933
2	Watch and Ward	Apr-Mar	15	4665	0	4665
	Total		18	5598	0	5598
3	Monitoring and supervision charge 5% of the total cost					280
	Grand total		18	5598	0	5878
10TH YEAR MAINTENANCE						
1	Fireline tracing (2m wide fireline over 400 m length) & cultural operation	Feb/Mar	3	933	0	933
2	Watch and Ward	Apr-Mar	15	4665	0	4665
	Total		18	5598	0	5598
3	Monitoring and supervision charge 5% of the total cost					280
	Grand total		18	5598	0	5878

ABSTRACT

Sl. No.	Year	No. Person day	Labour cost @Rs.311/-per day	Material cost in Rs.	Monitoring and supervision charge 5% of the total cost	Total cost in Rs.
1	2	3	4	5	6	7
1	0th year	37	11507	0	575	12082
2	1st year	89	27679	52380	4003	84062
3	2nd year	52	16172	10600	1338	28110
4	3rd year	48	14928	2200	856	17984
5	4th year	18	5598	0	280	5878
6	5th year	18	5598	0	280	5878
7	6th year	18	5598	0	280	5878
8	7th year	18	5598	0	280	5878
9	8th year	18	5598	0	280	5878
10	9th year	18	5598	0	280	5878
11	10th year	18	5598	0	280	5878
Total		352	109472	65180	8732	183384

Annexure-II**ESTIMATE FOR BARBED WIRE FENCE**

7 stands straight + 2 diagonal strands of 2 ply barbed wire on RCC posts fixed at 2.5 mt intervals.

Two struts at every 10th pillar,

Fence post size length -8ft , Bottom width 6" x 6" , top width -4" x 4' reinforced with 6mm rods minimum wage rate Rs 311/- per day for unskilled labourer.

ANALYSIS OF RATE

1	Earth work in hard or gravelly soil within 50m. initial lead and 1.5m initial lift including rough dressing of clods to maximum 5 cm to 7cm and laying in layers not exceeding 0.3 m in depth (per 100 cum)			
	Mulia	43	311	13373
	2% sundries and T & P etc.			267.46
	Total			13640.46
2	Cement concrete (1:4:8) with 4 cm hard granite metal including lying, compacting curing with all cost, conveyance, royalty of materials etc. (per 1 cum)			
	HG metal	0.96 cum	Rs 1223.40	1174.64
	Sand	0.48 cum	Rs 443.00	212.62
	Cement	1.72qntl	Rs 630.00	1083.60
	Mason 2 nd class	0.18	Rs 401	72.18
	Man mulia	1.80	Rs 311	559.80
	Woman mulia	1.40	Rs 311	435.40
	Man mulia	0.70	Rs 311	217.70
	Total			3755.94
3	Cement concrete (1:2:4) with 12mm size CBGH chips including cost, carriage & royalty etc complete			
	HG metal 12 mm	0.96cum	Rs 1581.40	1518.14
	Sand	0.45cum	Rs 443.42	199.53
	Cement	3.23qntl	Rs 630.00	2034.90
	Mason 2 nd class	0.60	Rs 401	240.60
	Mulia	4.60	Rs 311	1430.60
	Total			5423.77
4	Cutting, bending, binding , straightening and tying the grills and			

	placing in position including cost of MS tor steel and binding wire etc . Taking output for 1 quintal			
	cost & carriage HYSD steel including 5% for wastage& overlapping	1.05qntl		5775.00
	Binding wire	8 kg	Rs 90/kg	720.00
	Labour for Cutting, bending, bending , shifting to site and tying and placing in position	0.44	351	154.44
	Mate			
	Blacksmith special	4	461	1844
	Semiskilled mulia	8	351	2808
	Total			11301.44

ESTIMATE

- 1) 02 PLY barbed wires 5 rmt per kg)
 7 Straight stand x 1000 mt = 7000mt
 2 diagonal stand = $2 \times \sqrt{\{(6.5)^2 + (8.2)^2\}} = 2 \times 10.50\text{ft}$
 = 21.00 ft x 400 nos = 8400 ft or = 2560 mt
 = 9560 mt

Requirement of Barbed wire per km

Cost per km = $9560/5 = 1912 \text{ kg @ Rs } 90/\text{kg}$ = **Rs 1,72,080.00**

- 2) Construction of RCC Pillar size of length 8ft, Bottom width 6" x 6" ,
 Top width – 4"x4" Reinforced with 6mm rods with proper curing
 $\{8 \times (6" + 4")/2\} \times (6" + 4")/2 = 1.34\text{ft or } 0.038 \text{ cum}$

- i) Cost of CC work 1:2:4 **0.038cum @ 5423.77/cum** = 206.10
 ii) Cost of rod including cutting bending & binding
 $0.038 \times 0.9 \text{ qtl} = 0.0342 \text{ qtl @ Rs } 11301.44 / \text{qtl}$ = 386.50
 iii) Contingency (15%) including = 88.90
 curing, stacking ,provision of hooks etc

Rs 681.50

Requirement of pillars per kilometer

Spacing = 2.5m x 2.5mt

Requirement = $1000\text{mt} / 2.5\text{mt}$ = 400

Strut pillar in every 10th pillar = $(400/10) \times 2 = 80$

480 nos

Cost of pillars per km = **480@681.50 /-**

Rs 327120.00