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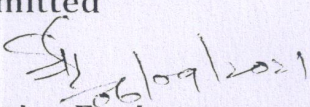
**COMPENSATORY AFFORESTATION SCHEME
OVER AN AREA OF 34.7Ha. FOREST LAND IN
PHULBANI FOREST DIVISION**

**(FOR Diversion of 27.343 ha of Forest land for
widening of NH-157- A Central Govt. Project)**

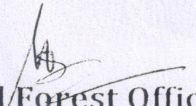
Plantation Model:

Bald Hill Plantation 18.00 Ha @1600 seedlings per ha
ANR Gap plantation 16.70 Ha @600 plants per ha

Submitted


Executive Engineer
NH Division, Sambalpur

Countersigned & forwarded


Divisional Forest Officer,
Phulbani Division
~~Divisional Forest Officer~~
Phulbani Forest Division

SCHEME FOR COMPENSATORY AFFORESTATION

1. Introduction:

Widening of existing 2 lane to 2 lane with 1.5 mtr wide paved shoulder from Km 0/00 to Km 81/00 Km & Km 93/00 to Km 119/00 of NH-157 on EPC mode in Kandhamal and Ganjam District in the State of Odisha involves diversion of 27.343 ha of Forest land. This project is being executed by the National Highway Division, Sambalpur – A State Government Organization. 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 27.343 ha. The required CA Land is 27.343ha x 2= 54.686 ha Out of 54.686 ha of Degraded Forest Land 34.70 ha has been identified in Phulbani Division and 20ha in Ghumsur North Division. This scheme is prepared for degraded Forest land identified in Phulbani Division over an area of 34.70 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	Talarimaha PRF		G. Udayagiri	18.00
2	Paburia PRF		G. Udayagiri	16.70
	Total 2 patches			34.70 ha

The 1st patch is bounded by

Latitude: 20°11'12.57895" N to 20°11'33.8569"N and

Longitude: 84°22'01.5966" E to 84°22'19.68927" E.

The Boundary Point Latitude / Longitude of Talaromaha PRF Patch-I is on the DGPS map and reproduced below.

DGPS coordinate of Talarimaha PRF			
Sl no	Point ID	Latitude	Longitude
1	po.1	E84°22'08.92083"	N20°11'23.63862"
2	po.2	E84°22'7.956"	N20°11'21.152"
3	po.3	E84°22'08.43933"	N20°11'18.82815"
4	po.4	E84°22'08.42369"	N20°11'13.88548"
5	po.5	E84°22'12.64414"	N20°11'12.94609"
6	po.6	E84°22'15.01588"	N20°11'12.57895"
7	po.7	E84°22'16.87774"	N20°11'16.29099"
8	po.8	E84°22'18.66759"	N20°11'18.80476"
9	po.9	E84°22'19.68927"	N20°11'19.58209"
10	po.10	E84°22'18.87017"	N20°11'23.82893"

11	po.11	E84°22'17.57122"	N20°11'26.60173"
12	po.12	E84°22'16.23233"	N20°11'28.50596"
13	po.13	E84°22'13.70714"	N20°11'29.79357"
14	po.14	E84°22'11.45192"	N20°11'30.82324"
15	po.15	E84°22'08.99829"	N20°11'32.04367"
16	po.16	E84°22'05.83500"	N20°11'33.85690"
17	po.17	E84°22'01.59660"	N20°11'30.15384"
18	po.18	E84°22'03.48203"	N20°11'27.71003"
19	po.19	E84°22'05.94995"	N20°11'25.78084"
20	po.20	E84°22'06.38821"	N20°11'24.42627"

The 2nd Patch is in Paburia PRF. The selected area is bounded by

Latitude: 20°11'28.576" N to 20°11'41.783"N and

Longitude: 84°16'15.333" E to 84°16'34.652" E.

The Boundary Point Latitude / Longitude of PaburiaPRF Patch-II is on the DGPS map and reproduced below.

DGPS coordinate of Paburia PRF			
Sl no	Point ID	Latitude	Longitude
1	PO.1	E84°16'17.270"	N20°11'28.576"
2	PO.2	E84°16'15.941"	N20°11'29.530"
3	PO.3	E84°16'15.495"	N20°11'30.544"
4	PO.4	E84°16'15.333"	N20°11'36.243"
5	PO.5	E84°16'15.641"	N20°11'37.560"
6	PO.6	E84°16'15.607"	N20°11'39.359"
7	PO.7	E84°16'16.531"	N20°11'40.130"
8	PO.8	E84°16'17.323"	N20°11'40.951"
9	PO.9	E84°16'18.454"	N20°11'41.635"
10	PO.10	E84°16'20.260"	N20°11'41.783"
11	PO.11	E84°16'21.897"	N20°11'41.409"
12	PO.12	E84°16'24.238"	N20°11'40.370"
13	PO.13	E84°16'27.502"	N20°11'40.206"
14	PO.14	E84°16'30.138"	N20°11'39.499"
15	PO.15	E84°16'32.227"	N20°11'39.290"
16	PO.16	E84°16'33.180"	N20°11'38.991"
17	PO.17	E84°16'33.963"	N20°11'38.466"
18	PO.18	E84°16'34.652"	N20°11'34.749"
19	PO.19	E84°16'34.652"	N20°11'33.674"
20	PO.20	E84°16'33.463"	N20°11'33.002"
21	PO.21	E84°16'27.082"	N20°11'31.385"
22	PO.22	E84°16'24.575"	N20°11'29.845"

23	PO.23	E84°16'23.035"	N20°11'28.609"
24	PO.24	E84°16'20.684"	N20°11'28.780"

Both the patches are found on Survey of India Topo Sheet No F45S8 (73D/8) (1:50000 Scale)
The topo map & DGPS Map are at Plate No I,II & III enclosed.

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 Talarimaha PRF 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 5° to 30° Some plain areas are observed in Paburia PRF

Climate:The climate is tropical and average rainfall is 1300 mm to 1400mm with a cool climate in most of the period of a year. The average summer temperature is about 35°C and minimum temperature in winter falls below 5°C Due to hilly terrain occasional flash flood is experienced in the region / locality.

Vegetation:

1st patch: (Talarimaha PRF)

The identified patch was under podu cultivation 2 to 3 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 are observed. Due to grazing, the seedlings are not established at present. The area is infested with Latena and invasion to this podu abandoned area is feared.

2nd patch (Paburia PRF)

This patch is heavily affected by Bio Tic interference. Blank areas are dotted with some left out standing trees of Sal, Mango, mahula, Jamu, Asan etc. The area is partly infested with weeds like eupatorium and lantana. The land is partly vegetated (Crop density <20%).

Biotic interference:

Besides Shifting Cultivation which this tract heavily experiences, grazing / browsing by cattle and Goat. Fire also occurs in summer.

Villages surrounding the area.

The population in these villages is as given below.

Name	No_HH	TOT_P	TOT_M	TOT_F	P_SC	P_ST	Remark
Near to Talarimaha PRF							
Panganaju	28	92	40	52	26	66	
Badamaha	151	563	258	305	152	389	
RudaBiringia	145	633	315	318	33	585	
Near to Paburia PRF							
Sartagurra	58	403	151	252	29	345	
Kutinaju	51	192	87	105	11	115	
Ponagoberi	33	125	58	67	0	53	

3. Plantation Model:

Patch –I (Talarimaha PRF)

The total area identified in this site is 18.0 ha .The area will be planted up in a Bald hill Plantation Mode @ 1600 plants per ha will be planted up as per approved cost nor @Rs311.00 per MD

2nd Patch (Paburia PRF)

Total area identified is 16.70 ha. It will be treated under ANR Mode with gap planting @600 seedlings per ha.

Abstract of Plantation Model

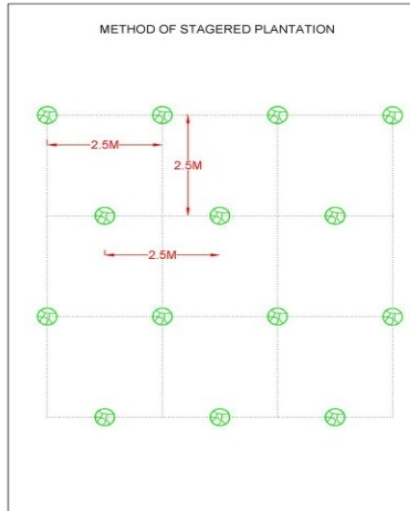
Sl no	Description	Model		
	Talarimaha PRF (Patch-I)		Paburia PRF (Patch-II	
1	Bald Hill plantation	18.00 ha	ANR	16.70 ha
2			Silvicultural Cleaning	16.70 ha
3	Spacing	2.5mx2.5m	Spacing	2.5mx2.5m on blank available space
4	No of saplings to be planted per ha	1600	Seedling per ha (Gap planting)	600 per ha
5	Total seedlings Proposed for planting	1600*18ha= 28800	Total seedlings to be Planted	16.7x600= 10,020
6	Vegetative Fencing & Barbed wire fencing	Around 2.5km on outer boundary only	Barbed wire fencing	1.50 km
	Add. Soil & Moisture conservation	As required		As required.

5. Technical details:-

General:(Patch-I) Talarimaha PRF: The plantation will be taken up bald hill plantation model.

In patch-II (Paburia PRF):Plantation will be taken up in ANR with gap plantation @600 plants/Ha. with silvicultural tending operation. The year wise activities to be implemented has been enumerated in the approved Cost norm at annexure-I, II & II

- b) Spacing:** The plant density proposed for planting is @1600 plants per ha. The spacing is 2.5mX2.5m 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.

In case of Patch-II ,Paburia PRF the spacing 2.5mx2.5m will also be adopted for gaps.

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. In the plain / moderate slope species suggested are

1. *Bombax ceiba* (Simili)
2. *Cassia fistula* (Sunari)
3. *Dendrocalamus strictus*. (Baunsha)
4. *Dalbergia latifolia* (Pahadisiso)
5. *Gmelina arborea* (Gambhari)
6. *Mangifera indica* (Aamba)
7. *Phyllanthus emblica* (Anla)
8. *Syzygium cumini* (Jamun)
9. *Bridelia retusa* (Kasi)
10. *Terminalia tomentosa* (Asan)
11. *Ziziphus mauritiana* (Bara koli)
12. *Bauhinia vahlii* (Siali)

(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.

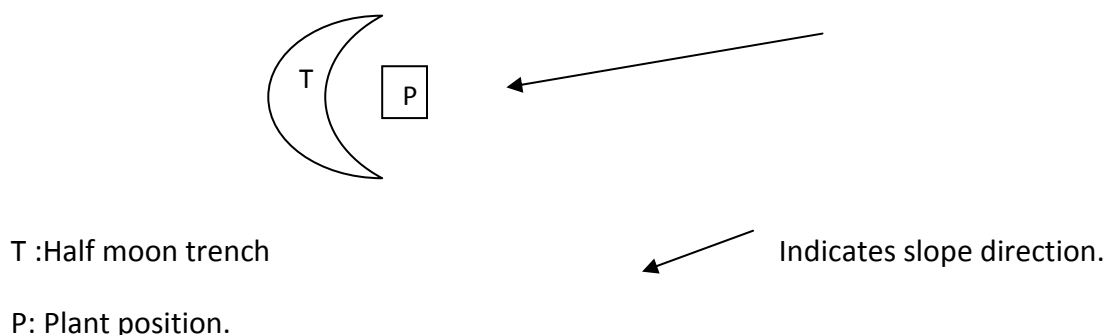
Alignment and stacking will be taken up in the month of January. Pits of size 45 cm x 45cm x 45cm are to be dugout with a spacing of 2.5mt x 2.5mt @1600 plants per hectare. Pitting of size 45 cmx45cmx45cm will be adopted for all three models proposed above.

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:

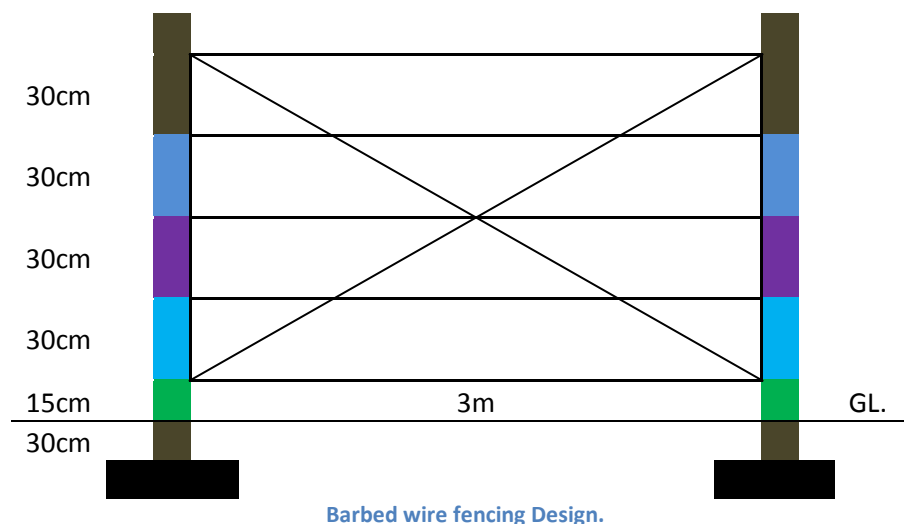
Tender seedlings planted are subject to damage by ground fire. It is required to protect the plantation and forest growth from fire hazard by tracing of fire lines. Boundary of the plantation and several internal lines need to be scrapped to a width of 2mtr during February-March. The cut back materials 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 standard norm for fencing is 126 Rmt per hectare. Hence it is proposed to fence (1st Patch 34.76 ha = 4380 meter for 2nd patch (Additional Land): 8.552ha = 1078 meter.

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- IV.

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 two rivulets are passing through 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 tribal's and they have a liking for fruit bearing trees i.e. Mango, Jack Fruit and Jamun. 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 Talarimaha PRF

For Talarimaha PRF @ Rs 311/- per MD (Patch-I) Area 18 Hectare					
SI No	Description	Unit	Rate	Quantum	Total amount in Rs
1	Bald hill plantation	Ha	504626.75	18.00	9083281.50
A	S. Total				9083281.50
B	Barbed wire Fencing	RKM	714701	2.5	1786752.5
4	Add. Soil & Moisture Conservation Measure				
A	Percolation Pit 64 nos per ha @22 MD/ ha	ha		18	123156
B	LBCD		20000/-	15	300000
C	Contour bonding	RKM	7.00 L	3	2100000
C	S. Total				2523156
5	EPA 15% of (A+B)				1630505
	Total				150,23,695

2. For Paburia PRF

For Paburia PRF @ Rs 311/- per MD (Patch-II) over 16.7 Hectare					
SI No	Description	Unit	Rate	Quantum	Total amount in Rs
1	ANR with Gap planting @600 plants per ha	Ha	105012.6	16.7	1753710.40
2	Barbed wire Fencing	RKM	714701	1.50	1072051.50
A	Sub total				2825761.9
4	Add. Soil & Moisture conservation				
A	Percolation Pit 64 nos per ha @22 MD/ ha	ha		16.7	114261.4
B	LBCD		20000/-	15	300000
C	Contour bonding	RKM	7.00 Lakh	2	1400000
B	S. Total				1814261.4
5	EPA 15% of (A)				423864
	Total				50,63,887.30

Total Project Cost under Compensatory Afforestation comes to Rs 2,00,87,582. 30 or say 200.87 Lakh. (Rupees Two Crore Eighty seven thousands Only)

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

DGPS map: Plate no II & III

Cost norm for Bald Hill Plantation, & ANR with gap planting @600 plants per ha (annexure-I,II,III)

Executive Engineer
NH Division, Sambalpur

Divisional Forests Officer
Phulbani Forest Division.
Divisional Forest Officer
Phulbani Forest Division.

Annexure-I

Cost Norm for Bald Hill Plantation @1600 plants per Hectare						
(Labour cost @Rs311 per manday)						
Sl. No	Item of Work	Preferable period of Execution	Person days	Labour cost @Rs311/- per day	Material cost per ha in (Rs)	Total cost per ha (Rs)
0th Year						
1	Survey and demarcation	June	2	622.00	0.00	622.00
2	Fencing (i) For an average of 126 meters/ha @ Rs.76.19/- per meter for bamboo twigs and bamboo thorn fencing (L:M=40:60)	June-Sept	19	5909.00	4280.00	10189.00
	(ii) To be strengthened by planting of bamboo and other seedlings in two rows. Bamboo to be planted at 2 meters spacing in staggered manner on the two rows, and the rest of the species to be planted at 1/2 meter spacing along the two rows, the rows being 2m apart. Thus 500 plant (125 bamboo and 375 others) to be planted in two rows to cover 126 m of periphery/Ha by the vegetative fence (Bamboo seedlings @ Rs.12.43 per seedling X 125 = Rs.1553.75, Agave seedling @ Rs.4.90 per seedling X 375 = Rs.1837.50)	June-Sept	11	3421.00	3391.25	6812.25
3	Pitting (1600 per ha) each pit-45 cm ³	Nov-Dec	128	39808.00	0.00	39808.00
4	Soil and water conservation measures (a) Staggered trench along the contour @ 300 per ha (2.5mx0.5 m x0.5m), digging of percolation pits @ 600 per ha in lieu of staggered trenches, gully plugging and Drainage line treatment, half moon trench on the uphill side of each planting pit (100 MD for staggered trench / percolation pits and 30 MD for gully plugging, drainage line treatment and half moon trench).	Sept-Nov	130	40430.00	0.00	40430.00
	(b) Site clearance- 8 MD, alignment and staking of contour lines on ground, planting pits, contour trenches / percolation pits and check dam sites, etc.- 2 MD	July-Aug	10	3110.00	0.00	3110.00
5	Raising of seedlings in poly bags 18 month old (@37.96 per seedlings and now required Rs. 13.58 for 0 th Year for 1760 saplings to be raised for one hectare)	Oct-Mar	114.5	35609.5	4787	40396.5
	Sub Total		414.5	128909.5	12458.25	141367.75

6	Monitoring & Supervision charge 5% of the total cost					7068
	Grand Total Oth Year		414.5	128909.5	12458.25	148435.75
Planting Operation(1st Year)						
1	Cost of sapling (balance) from April-June/July @ Rs 14.87 per seedling for 1760 seedlings	Apr- Jun	62	19282	7131	26413
2	Freshening of pits -64 MD, filling with fertile soil and farm yard manure (FYM) -24 MD, application of insecticide and planting of 60 cm tall saplings including carriage of plants- 21 MD	June-July	109	33899.00	0.00	33899.00
3	Cost of Fertile Soil 0.25 cft @ Rs.8 per cft/FYM 0.25cft@ Rs.15 per cft per pit		0	0.00	9200.00	9200.00
4	Sowing of seeds on dug out earth of trench	June	6	1866.00	200.00	2066.00
5	Transportation of seedlings from Central Nursery to Plantation site @6/- per seedling for 1760 seedlings		0	0	10560	10560
6	Carriage -6 MD, Planting including Casualty replacement-6 MD, fertilizer application- 5 MD, 1st weeding-7 MD, 2nd weeding -5 MD, soil working- 7 MD	July-Aug	36	11196.00	0.00	11196.00
7	cost of Fertilizer and insecticide (Granular Insecticide @ 5 gms/plant @ Rs.80/- per kg=Rs.640.00, NPK 100 gms/plant in two doses @ Rs.24 per kg= 3840		0	0.00	4480.00	4480.00
8	Repair and maintenance of bamboo fence including material cost	Aug-Oct	15	4665.00	2540.00	7205.00
9	Maintenance of soil and Moisture Conservation measures (20% of cost)	Oct-Dec	26	8086.00	0.00	8086.00
10	Closure to grazing fire and other biotic interference by engaging watch & ward	April-Mar	30	9330.00	0.00	9330.00
11	Fire tracing and control, display board construction, painting / writing, other miscellaneous cost	Jan-feb	10	3110.00	360.00	3470.00
	Sub Total		294	91434	34471	125905
12	Monitoring & Supervision charge 5% of the total cost					6295
	Grand Total		294	91434	34471	132200
Maintenance operation (2nd Year)						
1	Casualty replacement- 6 MD including seedling cost @Rs.37.96 per seedling and its transportation	June-July	16	4976	1098	6074
2	Soil working- 7 MD, 1st weeding-6 MD, 2nd weeding -6 MD and fertilizer application -4 MD	Aug-Oct	23	7153.00	0.00	7153.00

3	Cost of fertilizer @ 50 gms NPK per plant @ Rs.24/- per kg for 1600 plants =Rs.1920.00 Insecticide @ 5 gm per plant for 160 nos. of plants @ Rs. 80 per KG = Rs. 64.00		0	0.00	1984.00	1984.00
4	Repair and maintenance of bamboo fence including material cost	Aug-Oct	15	4665.00	2540.00	7205.00
5	Maintenance of Soil and Moisture Conservation measures (20% of cost)	Aug-Oct	26	8086.00	0.00	8086.00
6	Fire tracing and control and other miscellaneous cost	Feb-Mar	10	3110.00	0.00	3110.00
7	Closure to grazing, fire and other biotic interference by engaging watch and ward	Apr-Mar	30	9330.00	0.00	9330.00
	Sub Total		120	37320	5622	42942
8	Monitoring & Supervision charge 5% of the total cost					2147
	Grand Total		120	37320	5622	45089

Maintenance operation (3rd Year)

1	Repair and maintenance of fence-15 MD/ (in case of barbed wire fencing Rs.9000/- for repair), SMC measures (Renovation)-26 MD and maintenance of plantation-14 MD as per requirement	April-Mar	55	17105.00	500.00	17605.00
2	Closure to grazing, fire and other biotic interference by engaging watch and ward	April-Mar	18	5598.00	0.00	5598.00
	Sub Total		73	22703.00	500	23203
3	Monitoring & Supervision charge 5% of the total cost					1160
	Grand Total		73	22703	500	24363

Maintenance operation (4th Year)

1	Repair and maintenance of fence-13 MD / no maintenance in case of barbed wire fencing, SMC measures - 21 MD and maintenance of plantation-14 MD	April-Mar	48	14928.00	500.00	15428.00
2	Closure to grazing, fire and other biotic interference by engaging watch and ward	Apr-Mar	18	5598.00	0.00	5598.00
	Sub Total		66	20526.00	500	21026
3	Monitoring & Supervision charge 5% of the total cost					1051
	Grand Total		66	20526	500	22077

Maintenance operation (5th Year)

1	Repair and maintenance of fence-13 MD / no maintenance in case of barbed wire fencing, SMC measures - 21 MD and maintenance of plantation-14 MD	April-Mar	48	14928.00	500.00	15428.00
2	Closure to grazing, fire and other biotic	Apr-Mar	18	5598.00	0.00	5598.00

	interference by engaging watch and ward					
	Sub Total		66	20526.00	500	21026
3	Monitoring & Supervision charge 5% of the total cost					1051
	Grand Total		66	20526	500	22077
Maintenance operation (6th Year)						
1	Repair and maintenance of fence-13 MD / no maintenance in case of barbed wire fencing, SMC measures - 21 MD and maintenance of plantation-14 MD	April-Mar	48	14928.00	500.00	15428.00
2	Closure to grazing, fire and other biotic interference by engaging watch and ward	Apr-Mar	18	5598.00	0.00	5598.00
	Sub Total		66	20526.00	500	21026
3	Monitoring & Supervision charge 5% of the total cost					1051
	Grand Total		66	20526	500	22077
Maintenance operation (7th Year)						
1	Repair and maintenance of fence-13 MD / no maintenance in case of barbed wire fencing, SMC measures - 21 MD and maintenance of plantation-14 MD	April-Mar	48	14928.00	500.00	15428.00
2	Closure to grazing, fire and other biotic interference by engaging watch and ward	Apr-Mar	18	5598.00	0.00	5598.00
	Sub Total		66	20526.00	500	21026
3	Monitoring & Supervision charge 5% of the total cost					1051
	Grand Total		66	20526	500	22077
Maintenance operation (8th Year)						
1	Repair and maintenance of fence-13 MD / no maintenance in case of barbed wire fencing, SMC measures - 21 MD and maintenance of plantation-14 MD	April-Mar	48	14928.00	500.00	15428.00
2	Closure to grazing, fire and other biotic interference by engaging watch and ward	Apr-Mar	18	5598.00	0.00	5598.00
	Sub Total		66	20526.00	500	21026
3	Monitoring & Supervision charge 5% of the total cost					1051
	Grand Total		66	20526	500	22077
Maintenance operation (9th Year)						
1	Repair and maintenance of fence-13 MD / no maintenance in case of barbed wire fencing, SMC measures - 21 MD and maintenance of plantation-14 MD	April-Mar	48	14928.00	500.00	15428.00
2	Closure to grazing, fire and other biotic interference by engaging watch and ward	Apr-Mar	18	5598.00	0.00	5598.00

	Sub Total		66	20526.00	500	21026
3	Monitoring & Supervision charge 5% of the total cost					1051
	Grand Total		66	20526	500	22077
Maintenance operation (10th Year)						
1	Repair and maintenance of fence-13 MD / no maintenance in case of barbed wire fencing, SMC measures - 21 MD and maintenance of plantation-14 MD	April-Mar	48	14928.00	500.00	15428.00
2	Closure to grazing, fire and other biotic interference by engaging watch and ward	Apr-Mar	18	5598.00	0.00	5598.00
	Sub Total		66	20526.00	500	21026
3	Monitoring & Supervision charge 5% of the total cost					1051
	Grand Total		66	20526	500	22077
	Grand Total		1246.5	387662	81403	492518

ABSTRACT.					
Year	Person days	Labour Component	Material Component	Monitoring & Supervision charge 5% of total cost	Total
0th Yr	414.5	128909.5	12458.25	7068	148435.75
1st yr	294	91434	34471	6295	132200
2nd Yr	120	37320	5622	2147	45089
3rd Yr	73	22703	500	1160	24363
4th Yr	66	20526	500	1051	22077
5th Yr	66	20526	500	1051	22077
6th Yr	66	20526	500	1051	22077
7th Yr	66	20526	500	1051	22077
8th Yr	66	20526	500	1051	22077
9th Yr	66	20526	500	1051	22077
10th Yr	66	20526	500	1051	22077
Total	1363.5	424048.5	56551.25	24027	504626.75

Annexure-II

Cost Norm For ANR (@600 Plants per Hectare)						
With 10 Years Maintenance.						
Wage rate- @Rs.311/-Manday						
Sl. No	Item of Work	Preferable period of Execution	Person days	Labour (Rs)	Material (Rs)	Total (Rs)
0th Year						
1	Survey, Demarcation and Pillar Posting, GPS Reading with mapping	Nov/ Dec	2	622	0	622
2	Site Preparation	Nov/ Dec	2	622	0	622
3	Silvicultural Operation including clearance of weed, climber cutting, high stump cutting, singling of shoots etc.	Jan/ Feb	5	1555	0	1555
4	Nursery cost (18months old seedling) part @ Rs. 37.96 seedling (Rs 25.00 in 0th year + Rs 12.96 in 1st year) for 660 seedlings (600+60)	Jan/ March	43	13373	1795	15168
5	Contingency and Unforeseen Expenditure		0	0	198	198
	Sub Total		52	16172	1993	18165
6	Monitoring & Supervision charge 5% of the total cost					908
	Grand Total		52	16172	1993	19073
1st Year						
1	Nursery cost (18 months old seedling) balance part @ Rs37.96 for 660 seedlings	Apr- June	23	7153	2733	9886
2	Pitting 45 cm cube size	Feb/ Mar	48	14928	0	14928
3	Transportation cost of seedlings from Central Nursery to Plantation site@Rs.6/-per seedlings for 660 seedlings.		0	0	3960	3960
4	Carriage and planting including casualty replacement	Jul/ Aug	15	4665	0	4665
5	Complete weeding, Soil working, manuring	Aug /Sep	18	5598	0	5598
6	Cost of Vermi compost @ 200 gms/plant @ Rs 20/- per Kg = Rs 2400.00 and Granular insecticides 5 gms/plant @ Rs 80/- per Kg = Rs 240.00	Aug /Sep	0	0	2640	2640

7	Cost of Chemical Fertilizer (a) Urea 70 gms/plant in two subsequent doses @ Rs 6/- per Kg = Rs 252.00 (b) NPK 50 gms/plant @ Rs 24/- per Kg = Rs 720.00 as basal dose		0	0	972	972
8	Fire line tracing and inspection path	Sep/Oct	3	933	0	933
9	Silvicultural Operation involving clearance of weeds, cutting of climbers, singling of shoot etc.	Sep/Oct	15	4665	0	4665
10	Soil conservation measures (staggered trenches of dimension 2 m x 0.5 m x 0.5 m @ 60 nos per ha) or its equivalent	Sep/Oct	20	6220	0	6220
11	Watch & Ward	Aug- Mar	7	2177	0	2177
12	Contingency and unforeseen expenditure		0	0	353	353
	Sub Total		149	46339	10658	56997
13	Monitoring & Supervision charge 5% of the total cost					2850
	Grand Total		149	46339	10658	59847

2nd Year

1	Casualty Replacement including cost of seedling, carriage and planting 60 seedlings.	Jul/Aug	3	933	1344.6	2277.6
	Transportation cost of 60 seedlings from Central Nursery to Plantation site @ Rs.6/- per seedling		0	0	360	360
2	Complete weeding and cultural operations	Sep/Oct	6	1866	0	1866
3	Soil working and manuring	Sep/Oct	6	1866	0	1866
4	Cost of Fertilizer and insecticide (a) Vermi compost @ 200 gms/plant @ Rs 20/- per Kg = Rs 2400.00 (b) Granular insecticides 5 gms/plant for 60 plants 100 gms @ Rs 80/- per Kg = Rs 24.00	Sep/Oct	0	0	2424	2424
5	Fire line tracing and inspection path	Feb/ Mar	1	311	0	311
6	Soil conservation measures(Renovation of staggered trenches etc.)	Sep/Oct	8	2488	0	2488
7	Watch & Ward (Whole Year)	Apr-Mar	7	2177	0	2177
8	Contingency and unforeseen expenditure		0	0	193	193
	Sub Total		31	9641	4321.6	13962.6
9	Monitoring & Supervision charge 5% of the total cost					698
	Grand Total		31	9641.00	4321.6	14660.60

3rd Year						
1	Compete weeding and cultural operations	Aug /Sep	3	933	0	933
2	Soil working	Aug /Sep	3	933	0	933
3	Fire line tracing and inspection path	Feb/ Mar	1	311	0	311
4	Watch & Ward (Whole Year)	Apr-Mar	7	2177	0	2177
	Sub Total		14	4354	0.00	4354.00
5	Monitoring & Supervision charge 5% of the total cost					218
	Grand Total		14	4354.00	0.00	4572
4th Year						
1	Fire line tracing and inspection path	Feb/ Mar	1	311	0	311
2	Watch & Ward & Pruning	Apr-Mar	2	622	0	622
	Sub Total		3	933	0.00	933.00
3	Monitoring & Supervision charge 5% of the total cost					47
	Grand Total		3	933.00	0.00	980
5th Year						
1	Fire line tracing and inspection path	Feb/ Mar	1	311	0	311
2	Watch & Ward & Pruning	Apr-Mar	2	622	0	622
	Sub Total		3	933	0.00	933.00
3	Monitoring & Supervision charge 5% of the total cost					47
	Grand Total		3	933.00	0.00	980
6th Year						
1	Fire line tracing and inspection path	Feb/ Mar	1	311	0	311
2	Watch & Ward & Pruning	Apr-Mar	2	622	0	622
	Sub Total		3	933	0.00	933.00
3	Monitoring & Supervision charge 5% of the total cost					47
	Grand Total		3	933.00	0.00	980
7th Year						
1	Fire line tracing and inspection path	Feb/ Mar	1	311	0	311
2	Watch & Ward & Pruning	Apr-Mar	2	622	0	622
	Sub Total		3	933	0.00	933.00
3	Monitoring & Supervision charge 5% of the total cost					47
	Grand Total		3	933.00	0.00	980

8 th Year						
1	Fire line tracing and inspection path	Feb/ Mar	1	311	0	311
2	Watch & Ward & Pruning	Apr-Mar	2	622	0	622
	Sub Total		3	933	0.00	933.00
3	Monitoring & Supervision charge 5% of the total cost					47
	Grand Total		3	933.00	0.00	980
9 th Year						
1	Fire line tracing and inspection path	Feb/ Mar	1	311	0	311
2	Watch & Ward & Pruning	Apr-Mar	2	622	0	622
	Sub Total		3	933	0.00	933.00
3	Monitoring & Supervision charge 5% of the total cost					47
	Grand Total		3	933.00	0.00	980
10 th Year						
1	Fire line tracing and inspection path	Feb/ Mar	1	311	0	311
2	Watch & Ward & Pruning	Apr-Mar	2	622	0	622
	Sub Total		3	933	0.00	933.00
3	Monitoring & Supervision charge 5% of the total cost					47
	Grand Total		3	933.00	0.00	980
	Grand Total		195.5	60800.50	28878.50	94163

ABSTRACT.					
Year	Person days	Labour Component	Material Component	Monitoring & Supervision charges @ 5% of total cost	Total
0th Yr	52	16172	1993	908	19073
1st yr	149	46339	10658	2850	59847
2nd Yr	31	9641.00	4321.6	698	14660.6
3rd Yr	14	4354.00	0.00	218	4572
4th Yr	3	933.00	0.00	47	980
5th Yr	3	933.00	0.00	47	980
6th Yr	3	933.00	0.00	47	980
7th Yr	3	933.00	0.00	47	980
8th Yr	3	933.00	0.00	47	980
9th Yr	3	933.00	0.00	47	980
10th Yr	3	933.00	0.00	47	980
Total	267	83037	16972.6	5003	105012.6

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. intial 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 Mate	0.44	351	154.44
	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 x 0.9 qtl = 0.0342 qtl @ Rs 11301.44 /qtl = 386.50

iii) Contingency (15%) including curing, stacking ,provision of hooks etc = 88.90

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

- 3) Fitting of fixing of RCC pillars in position with HBG metal (4cm) in C.M (1:4:8)
- i) Digging of pits $1.5' \times 1.5' \times 1.5' = 3.375 \text{ cft/pit}$
For 480 pits $480 \times 3.375 = 1620 \text{ cft}$ or 45.86 cum @ $13640.46/100 \text{ cum} =$ **Rs 6255.51**
- ii) Fixing of pillars with 4cm hbg metals in C.M 1:4:8
Pit size $1.5' \times 1.5' \times 1.5' = 3.375 \text{ cft}$
Deduct $1/3$ th of butt of pillar i.e $3.375/3 = (-) 1.125 \text{ cft}$
Total C.C work per pillar -----
2.25 cft
For 480 pillars $= 480 \times 2.25 = 1080 \text{ cft}$ or 30.577 cum @ $3755.94/\text{cum}$ **Rs 114845.38**
- 4) Labour for straightening the barbed wire and fixing & clipping with pillars 70 M.D per km @311/- **Rs 21,770.00**
- 5) Carriage of Barbed wire & pillars to work site @ Rs 1000/tl and cost of loading & unloading within 5km distance
Approximately 10 tld @800/tld **Rs 18000.00**
- 6) Provision of one iron Gate of size (4'x5') on LS **Rs 7500.00**
- Total =
-
- Rs 667570.89**
- Labour Cess 1% = **Rs 6675.70**
- Expenditure per 1km of barbed wire fencing* **Rs 674246.60**
- 7) Expenditure towards maintenance for 3 years 3rd, 6th & 9th year)
@ 2% cost per rkm $= 3 \times 2\%$ of Rs 674246.60 **Rs 40454.79**
Expenditure per 1km of barbed wire fencing including maintenance **Rs 714701.39**

Or Say Rs 714701/-

Expenditure per meter of running fencing = 714.7 or 715/-