

**SCHEME FOR
COMPENSATORY AFFORESTATION
FOR 17.337 Ha (42.84 Ac)

AT
VILLAGE KOPSINGHA, SUNDARGARH

AGAINST ULTRA MEGA POWER PROJECT
OF
M/S. ORISSA INTEGRATED POWER LIMITED
BHEDABAHAL**

**Prepare by
Divisional Forest Office
Sundargarh Division**

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**SCHEME FOR COMPENSATORY AFFORESTATION OVER AN AREA OF 17.337 Ha
(42.84 acres) IN NON- FOREST LAND AT VILLAGE KOPSINGHA IN SUNDARGARH
DIVISION AGAINST ULTRA MEGA POWER PROJECT
OF M/S. ORISSA INTEGRATED POWER LIMITED BHEDABAHAL**

1.0 INTRODUCTION:

Ministry of Power, Government of India has initiated the scheme for development of Ultra Mega Power Project in India at pit head and Coastal locations to overcome acute power shortage in the country. The objective is to develop large capacity power projects in India and attract potential investors including private participation for development of such projects. Ministry of Power has designated Power Finance Corporation (PFC) as nodal agency for developing these Ultra Mega Power Projects (UMPP's) through Special Purpose Vehicles (SPVs) under the technical guidance of Central Electricity Authority (CEA). These SPVs would be transferred to the developers selected through the tariff based international competitive bidding. Government of Orissa has decided to support the development of UMPP in Orissa in providing necessary assistance and same was conveyed to Government of India.

Accordingly Orissa Integrated Power Limited (OIPL) a SPV of Power Finance Corporation (PFC), Government of India got the administrative approval of CEA, Government of India for getting all statutory clearances for establishment of project.

After several rounds of discussions between representatives of District Administration, OIPL and local people, the proposal for setting up of the project was approved in the Gram Sabhas held in January, 2010.

As per Gram Sabha resolution and Government of Orissa instruction, 1302.30 Ha (3218.102 acre) of land is being acquired. As per pre feasibility report, total land required for the project is 995.54 Ha (2459.998 acre). The excess land will be used for Compensatory Afforestation as per requirement and the balance is proposed for R & R Township for the project.

Within that project area Forest land constitutes for 17.02 Ha and OIPL has applied for forest diversion for the same. The purpose wise break up being as follows.

| Item wise break-up of land | Forest Area | | | | | | | | | |
|------------------------------|-------------|--------|----------------|----|----|----|-------|----|-------|-------|
| | Revenue | Forest | Reserve Forest | | PF | | DLC F | | Total | |
| | Ac | Ha | Ac | Ha | Ac | Ha | Ac | Ha | Ac | Ha |
| Switchyard Area | 0.00 | 0.00 | | | | | | | 0.00 | 0.00 |
| Main Plant | 0.00 | 0.00 | | | | | | | 0.00 | 0.00 |
| Reservoir Area | 6.77 | 2.74 | | | | | | | 6.77 | 2.74 |
| Coal Handling Area | 2.42 | 0.98 | | | | | | | 2.42 | 0.98 |
| Water System + Cooling Tower | 12.50 | 5.06 | | | | | | | 12.50 | 5.06 |
| Others | 0.00 | 0.00 | | | | | | | 0.00 | 0.00 |
| Green Belt Area | 0.00 | 0.00 | | | | | | | 0.00 | 0.00 |
| (A) Main Plant Area | 21.69 | 8.78 | - | - | | - | - | | 21.69 | 8.78 |
| (B) Ash Dyke Area | 20.36 | 8.24 | - | | - | | - | | 20.36 | 8.24 |
| (C) Colony Area | 0 | 0 | - | | - | | - | | 0 | 0 |
| Plant Area (A+B+C) | 42.05 | 17.02 | - | - | - | - | - | | 42.05 | 17.02 |

As per the provisions of FC Act the proposal for forest diversion has to include a compensatory afforestation scheme over equivalent non forest land. The equivalent non forest land was identified in the village Kopsingha in the Sundargarh Tehsil out of the excess area earmarked for the project. Accordingly this scheme is prepared in the Office of the Sundargarh Forest Division.

2.0 IDENTIFICATION OF NON-FOREST LAND

The proposal involves diversion of 17.02 Ha of forest land. As such equal extent of Non-Forest land has been identified in village Kopsingha in the Sundargarh Tehsil of Sundargarh district. The said non forest land for proposed CA site and revenue forest land within the project site was inspected by the DFO Sundargarh Division on 28.07.2015. The DFO Sundargarh vide his letter dated 14.08.2015

wrote to the Tehasildar, Sadar, Sundargarh to provide non-Encumbrance & non-Encroachment certificate for the identified CA site in village Kopsingha.

Accordingly, Tehasildar, Sadar, Sundargarh has provided non - Encumbrance & non - Encroachment certificate for the identified CA site in village Kopsingha. The land schedule for the non forest land for Compensatory Afforestation has been identified subject to certificate by the Tehasildar after the process of land acquisition and eviction from private land. Suitability certificate to this extent is enclosed as **Annexure-E**.

| Khata No. | Name of Raiyat | Plot No. | Classification of Land | Full Area of the Plot (Acre) | Area to be used for Compensatory Afforestation (Acre) | Remarks |
|---------------------|--|----------|------------------------|------------------------------|---|---------|
| PRIVATE LAND | | | | | | |
| 1 | Gopi Kalo, Pralada Kalo, Ganga Kalo, S/o Hari Kalo, Caste: Gond, Village: Own | 319 | Be Sa | 1.170 | 1.170 | |
| | | 386 | Gharbari | 0.260 | 0.260 | |
| 27 | Indra mani Karsal,S/o Mohan Karsal , Caste : Gauda, village:Own | 330 | Gharabari | 0.160 | 0.160 | |
| 33 | Kapil seth,Sashi seth,Rabiratna seth,Rusi Seth Chaitanya seth, Bansidhar seth Chandan seth S/o Basudev seth,Bhama seth,W/o Basudev Seth, Nilamani seth,S/o-Sukha Seth,Kulamani Seth,Tila seth,S/o Ram seth Caste: Dhoba, Village:Own | 387 | Gharbari | 0.340 | 0.340 | |
| 37 | Kalakar Prusest, Brunadaban Prusest, Parkhit Prusest, S/o Jayram Prusest, Arna Prusest, W/o Jayram Prusest Caste: Teli, Village: Own | 373 | Goda-1 | 0.120 | 0.120 | |
| 48 | Kulamani Seth,Tila Seth, S/o Ram Seth, Caste:Dhoba, Village: Own | 361 | Goda-2 | 0.300 | 0.300 | |
| 51 | Kailash kumra , S/o Nira kumra Caste: Gond, Village : Own | 382 | Gharbari | 0.050 | 0.050 | |
| 52 | Khagaswar Prusest S/o Balabhadra Prusest Caste: Teli, Village: Own | 378 | Goda- 1 | 0.130 | 0.130 | |

| Khata No. | Name of Raiyat | Plot No. | Classification of Land | Full Area of the Plot (Acre) | Area to be used for Compensatory Afforestation (Acre) | Remarks |
|-----------|--|----------|------------------------|------------------------------|---|---------|
| 59 | Gadadhar Negi S/o Satya Negi, caste: Gond, Vill: Own | 389 | Gharbari | 0.210 | 0.210 | |
| 61 | Ganjiya majhi,S/o : Mahakulu majhi,Caste: majhiya, Village : Own | 354 | Ma Sa | 0.500 | 0.500 | |
| 69 | Godabari Pruseth, Dhuki Pruseth, S/o Pabitra Pruseth, Caste: Teli, Village: Own | 372 | Goda- 1 | 0.140 | 0.140 | |
| 74 | Nilambara Pruseth,Kumari Pruseth,S/o-Mathura Naik,Caste-Teli,Vill-Own | 366 | Goda- 1 | 0.560 | 0.560 | |
| 79 | Chandra sekhar Kesari ,Gajaraj kesari, Nila kanta Kesari, Jagannath Kesari, S/o Birat Kesari, Chakra dhar Kesari, Purnachandra KesariS/o Bhojoraj Kesari, Caste: Khatriya, Village : Own | 325 | Goda- 1 | 0.280 | 0.280 | |
| | | 336 | Gharbari | 0.330 | 0.330 | |
| | | 346 | Ma Sa | 0.560 | 0.560 | |
| | | 347 | Ba Sa | 0.470 | 0.470 | |
| | | 348 | Ba Sa | 0.620 | 0.620 | |
| | | 363 | Goda- 1 | 0.530 | 0.530 | |
| | | 380 | Gharbari | 0.150 | 0.150 | |
| 81 | Chintamani Nagi,Parakhita Nagi Basudev Nagi, Kulamani Nagi, S/o Chakaradhar Nagi, Kumari dhrua, W/o Banamali dhrua,Kumudini majhi w/o Parakhita majhi, Caste:Gond, Village: own | 379 | Goda- 1 | 0.140 | 0.140 | |
| | | 388 | Gharbari | 0.380 | 0.380 | |
| | | 377 | Goda-2 | 0.120 | 0.120 | |
| 82 | Chitamani Nagi,Parakhita Nagi Basudev Nagi, Kulamani Nagi, S/o Chakaradhar Nagi, Caste:Gond, Village: own | 315 | Goda- 2 | 0.100 | 0.100 | |
| | | 349 | Ba Sa | 0.880 | 0.880 | |
| | | 316 | Nala | 0.640 | 0.640 | |
| | | 317 | Ba Sa | 0.860 | 0.860 | |
| 103 | Tirtha Kumura S/o Sama kumura Caste: gond Village: Own | 383 | Gharbari | 0.100 | 0.100 | |
| 113 | Dala Ganjan Kesari, Tribhuban Kesari,Pruthiraj Kesari,Priyaraj Kesari,Tejraj Kesari,S/o Dwarika Kesari, Chandrasekhar Kesari,Gajaraj Kesari,Nilakantha Kesari,S/o Birat Kesari,Jagannath Kesari,S/o chakaradhar Kesari,Purnachandra Kesari, S/o Bhukhan Kesari, Caste:Khatriya, Village: Own | 322 | Ma Sa | 0.400 | 0.400 | |
| | | 323 | Ma Sa | 0.610 | 0.610 | |
| | | 324 | Ma Sa | 0.660 | 0.660 | |
| | | 326 | Be Sa | 0.500 | 0.500 | |
| | | 327 | Be Sa | 0.570 | 0.570 | |
| | | 329 | Goda-2 | 0.120 | 0.120 | |
| | | 333 | Be Sa | 0.530 | 0.530 | |

| Khata No. | Name of Raiyat | Plot No. | Classification of Land | Full Area of the Plot (Acre) | Area to be used for Compensatory Afforestation (Acre) | Remarks |
|-----------|--|----------|------------------------|------------------------------|---|---------|
| | | 338 | Ba Sa | 2.250 | 2.250 | |
| | | 341 | Ba Sa | 2.500 | 2.500 | |
| | | 342 | Be Sa | 0.190 | 0.190 | |
| | | 344 | Ba Sa | 2.000 | 2.000 | |
| | | 345 | Goda-1 | 1.380 | 1.380 | |
| | | 385 | Gharbari | 0.270 | 0.270 | |
| | | 402 | Gharabari | 0.120 | 0.120 | |
| | | 371 | Goda-1 | 0.660 | 0.660 | |
| 115 | Dama Pruseth,S/o Suru Pruseth, Caste: Teli, Village:Own | 374 | Goda-1 | 0.110 | 0.110 | |
| 156 | Puti Majhi S/o Bhuluku Majhi, Ganjhiya Majhi, Ratu Majhi, Bhola Majhi, Renga Majhi S/o Mahakul Majhi Caste: Majhi, Village :Own | 350 | Goda-1 | 0.300 | 0.300 | |
| | | 351 | Panitala | 0.160 | 0.160 | |
| | | 356(P) | Goda-2 | 0.740 | 0.480 | |
| | | 352 | Goda-2 | 0.180 | 0.180 | |
| 177 | Bhikari Naik, S/o-Kanu Naik,Caste-Agaria, Village: Samina | 317/1718 | Ba. Sa. | 0.260 | 0.260 | |
| | | 309 | Bandha | 0.280 | 0.280 | |
| | | 311 | Adi | 0.220 | 0.220 | |
| 178 | Maheswara Naik,S/o-Bhubana Naik,Malabati Dei,w/o-Bhikari Naik,Rabiratna Naik,Durga charan Naik,S/o-Bhikari Naik, Caste-Agria,Village-Samina | 302 | Goda 1 | 3.910 | 3.910 | |
| | | 304 | Ba. Sa. | 1.720 | 1.720 | |
| | | 303 | Tala | 0.750 | 0.750 | |
| | | 310 | Bandha | 0.700 | 0.700 | |
| | | 312 | Ba. Sa. | 2.120 | 2.120 | |
| 189 | Mahaswar Naik S/o Bhuban Naik Caste: Agria, Village:Samina | 314 | Goda2 | 0.190 | 0.190 | |
| | | 313 | Nala | 0.200 | 0.200 | |
| | | 302/1705 | Goda 1 | 0.280 | 0.280 | |
| | | 312/1706 | Ba.Sa | 0.650 | 0.650 | |
| | | 317/1862 | Ba.Sa | 0.080 | 0.080 | |
| 200 | RabiRatna Naik,S/o-Bhikari Naik,Caste-Agria,Village-Samina | 306 | Be Sa | 1.000 | 1.000 | |
| | | 308 | Be Sa | 0.340 | 0.340 | |
| 214 | Rushi Naik,Kumari Naik, Lalani Naik Munu Naik, Raja Naik, Parbati Naik, S/o Gangadhar Naik, Gulabati Naik W/o Gangadhar Naik, Caste: Gond, Village:Own | 381 | Gharabari | 0.050 | 0.050 | |

| Khata No. | Name of Raiyat | Plot No. | Classification of Land | Full Area of the Plot (Acre) | Area to be used for Compensatory Afforestation (Acre) | Remarks |
|-----------------------------------|--|----------|------------------------|------------------------------|---|---------|
| 218 | Lambodhara Naik, S/o-Baghia Naik, Caste-Gond, Village- Own | 384 | Gharabari | 0.090 | 0.090 | |
| 223 | Satiya Pruseeth, Satrugan Pruseeth S/o Basudev Pruseeth, Caste:Teli, Village:own | 375 | Goda- 1 | 0.070 | 0.070 | |
| Total | | | | | 37.000 | - |
| Government Non Forest Land | | | | | | |
| 261 | Sarbasadharana | 328 | Dharsa | 0.18 | 0.18 | |
| | | 307 | Road | 0.11 | 0.11 | |
| | | 331 | Road | 0.12 | 0.12 | |
| | | 332 | Road | 0.16 | 0.16 | |
| | | 334 | Dharsa | 0.16 | 0.16 | |
| | | 335 | Road | 0.22 | 0.22 | |
| | | 365 | Road | 0.26 | 0.26 | |
| 262 | Abada Jogya Anabadi | 318 | Gochar | 3.04 | 3.04 | |
| | | 321 | Gochar | 0.36 | 0.36 | |
| | | 362 | Gochar | 0.41 | 0.41 | |
| | | 364 | Gochar | 0.6 | 0.6 | |
| | | 320 | Ma Sa | 0.16 | 0.16 | |
| | | 343 | Be Sa | 0.11 | 0.11 | |
| | | 353 | Patit | 0.38 | 0.38 | |
| | | 355(P) | Patit | 3.1 | 2.52 | |
| Total | | | | | 8.79 | |
| G.Total | | | | | 45.790 | |

| | |
|---------------|---|
| Note : | Plot No. 316, 351, 309, 311, 303, 310 and 313 are not suitable for compensatory afforestation which measures an area of: 2.95 acres to be reduced from G. Total Area. Thus there remains an area of <u>42.840 acres / 17.337 Ha.</u> |
|---------------|---|

The area of 17.337 Ha / 42.84 acres non- forest land has been verified jointly by revenue and forest department officials. The details of land schedule, boundary description of all plot and field book of the boundary survey data are enclosed in the scheme as per the following details.

| S. No | Description | Particulars |
|--------------|---|----------------------|
| 1 | Compensatory Afforestation site depicted on Survey of India Topo-Sheet on scale 1: 50000 | Plate No I |
| 2 | Original Village sheets showing the proposed boundary of Compensatory Afforestation site. | Plate No II, III, IV |
| 3 | Land schedule | Annexure - A |
| 4 | Coordinates of the CA boundary site | Annexure - B |
| 5 | Encumbrance & Encroachment Free Certificate | Annexure - C |
| 6 | Certificate to transfer recorded land for CA | Annexure - D |
| 7 | Suitability Certificate | Annexure - E |
| 8 | Certificate to Hand over non forest land for C A | Annexure - F |
| 9 | Plantation norm for block plantation | Annexure – G |
| 10 | Cost estimate for staggered trench | Annexure – H |
| 11 | Detail estimate for loose boulder structure (S.C.M) | Annexure – I |

3.0 TOPOGRAPHY AND SOIL

The topography of the non- forest land identified for this purpose is almost plain with few mounds. The soil is mostly laterite & clayey. At places there are continuous stony patches and one big pond not suitable for plantation and so the gross area selected is 18.53 Ha / 45.790 acres which after excluding the pond area will come to 17.337 Ha / 42.84 acres. Thus plantation in compensatory afforestation site in an area of 17.337 Ha / 42.84 acres will be carried out.

4.0 TEMPERATURE

The average temperature varies from 15°C to 49°C the minimum being in December- January and the maximum being in May-June.

5.0 RAINFALL

The annual rainfall varies from 780 to 1880 mm. The maximum rainfall is received during the rainy season from July to August.

6.0 EXISTING VEGETATION:

The area identified contains no forest growth. There are occasional occurrences of trees like Sal, Karla, Mahula, Kusuma, Tentuli, etc

7.0 OBJECTIVE OF THE SCHEME:

The proposed scheme is prepared with the following objectives.

- i) To fulfill statutory requirements of the forest conservation act 1980 relating to provisions of compensatory afforestation in non-forest land against use of forest land for non forestry purposes.
- ii) To increase the cover of identified non forest land so as to develop it into a dense forest.
- iii) To improve the micro-edaphic conditions by understanding suitable soil and moisture conservation measures.

- iv) To protect the area against encroachment, illicit felling fire occurrence grazing etc. so as to check further degradation of the area.
- v) To provide gainful employment to the local people mainly involving SC/ST population.
- vi) To create awareness among the local villagers on protection and maintenance of plantation and forest.

8.0 PROPOSED TREATMENT:

The non forest land contains no forest growth and it has almost blank patches. So only block plantation model will be applicable. The blank area will be planted with 1600 plants per hectare. In addition to that the Soil moisture conservation measures will be done in the entire area as a special package in addition to minor SMC work of the plantation component. The protection against grazing and biotic factors will also be given preferences. The plantation norm for block plantation is enclosed as **Annexure- “G”**.

8.1 SURVEY AND DEMARCATION:

The area has been surveyed and pillars posted by the user agency. Still before one year of planting the treatment area will be surveyed and demarcated in the field by posting survey pillars. The planted area to be divided into 4 ha per plots. This operation will be helpful in future maintenance and management. The plantation areas to be indicated by signboards at corners or at points of intersection with roads, inspection paths and boundary lines. The signboard should contain the name of the plantation site, area, year of planting and other details.

8.2 PLANTATION:

The area will be stocked by way of raising plantations @1600 plants per hectare in block plantation model .Though many local species will be given preferences in planting yet the following species has been recommended.

1. Tectona grandis (Teak)
2. Pongamia piñata (Karanja)

3. Azadiracta indica (Neem)
4. Pterocarpus marsupiun (Bija)
5. Emblic officinalis (Amla)
6. Terminalia belerica(Bahada)
7. Terminlia chebula(harida)
8. Dalbergia latifolia(PahadiSissoo)
9. Gmelina arborea (Gambhar)
10. Terminalia tomentosa(Asan)

Different operations those will be taken up for plantation are as follow.

i) Raising of nursery

Seedling required for plantation shall be raised a temporary nursery nearer to the planting site and perennial water sources. Nursery work will start one year before the year of plantation, so that second year seedlings will be available for plantation, Seeds shall be collected from plus trees and should be treated before dibbling. Polythene bag seedling should be raised 10% extra besides the actual requirement to compensate the casualties. Standard nursery practices will be followed for raising such polythene bag nursery.

ii) Alignment and pitting

Alignment and pitting will be taken up in the month of February to April, pits of size 30 cm x 30 cm will be dug maintaining a spacing of 2.5 mtr x 2.5 mtrs. The area will be divided into plots of 4 Ha. size.

iii) Actual planting

The seedling will be planted in the dug out pits of size 30cm x 30 cm x 30 cm with a spacing of 2.5 mtr x 2.5 mtr. 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, weeding soil working and manuring are necessary. It is prescribed that two weeding, 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 area weeding and the second will be of strip weeding. The weeding of third year will be an area weeding which will be carried out during august.

After each weeding, soil working will be done 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 eat and damage the tender leaves and shoots of the plants. To get rid of such insects attack application of the insecticides will be taken up in required doses at desired intervals. Spraying of insecticides shall be done preferably in a sunny day in the afternoon.

vi) Fire line tracing and maintenance

Fire causes heavy losses to the forest during fire season. To prevent incidence of fire, the area shall be divided in to suitable blocks by tracking fire lines. Boundaries of the plantation patches and these block lines will be scrapped of forest growth to width of 3.0 mtr during February-March and the cut back materials and the dry leaves stacked along these lines will be burnt under strict supervision. This operation shall be carried out for three years.

vii) Soil and Moisture Conservation Measure

The area contains number of small nallas and water channels. It is also adjoins the Ib river. So to check soil erosion staggered trenches of suitable sizes will be dug. In addition loose boulder check dams will also be erected at suitable locations.

viii) Special Soil Conservation Measure

The slope of the area varies from gentle to moderate and at places steep. Soil conservation measures are indispensable and area to be appropriately addressed. The following measures are proposed to be taken.

1. Staggered contour interval are to be due in sloped area of a size 2m X 50 cm X 50 cm at a contour interval of 5 meter and vertical interval of 2 meter. 1500 such staggered trenches are proposed to be due which shall be place in between the plantation contour line. This will help in conserving water for planted seeding and checking soil stabilized with vegetative plantation.
2. Linear contour bund is to be erected at foot over 2.5 km with vegetative plantation on the bund which will retard the velocity of water coming from the upper label to the plains, thereby help in checking soil erosion.
3. Check dams are proposed to be constructed out of dry rubble work in small nallah specially to be given on the upper reaches of the nallah. Ten such dams have been proposed to be taken up.
4. To check soil erosion and the rain water draining out of the area, it has been proposed to take up special conservation measures by digging staggered trenches along the contour over the area @200 nos per Ha. The size of the trenches will be 2 mtr X 0.5 mtr. Digging of staggered trenches will be done during September of first year. Agave planting will also be taken up on the dugout soil of the trench for its stabilization and to restrict the dugout soil from refilling into the trench. The cost norms are enclosed at **Annexure “ H ”**.

ix) Watering

To plants will be watered ones in a week in a rotation during lean seasons for about six months in the year to achieve faster growth.

9.0 Loose Boulder Structure (LBS):

Taking into the consideration the degradation of the area due to soil erosion it has been proposed to take up Soil Conservation Measures by construction of Loose Boulder Structure over the area of size (1mt=2 Nos., 2mt = 2 Nos.& 3mt= 1 Nos.)

| Name of the Range | Name of the site | Area in Ha. | Nos. of LBS | | |
|-------------------|------------------|-------------|--|--|---|
| | | | 1mt | 2mt | 3mt |
| Sundargarh | Kopsingha | 17.337 | 4 | 3 | 2 |
| | | | @Rs.3591/- per LBS = Rs. 14,364/- | @ Rs. 7119/- per LBS = Rs. 21,357/- | @ Rs. 14,931/- per LBS= Rs. 29,862/- |

The details of estimate of different size of Loose Boulder Structure are given in **Annexure - “ I ”**.

10.0 WATCH AND WARD:

To protect the area against grazing, fire accident and other biotic interference it is proposed to engage five watchers for three years after planting. In addition at strategic locations fencing will be done to check sudden intrusion of cattle.

11.0 FENCING

As the area adjoins Ib river there is every chances of biotic interference to the plantation area. Therefore it has been proposed to provide fencing along the boundary i.e strategic points over 2150 mtrs for 17.337 Ha @ 124 mtrs per Ha. The type of fence will be barbed wire as per the field requirement at the time of planting and detail estimate to be prepared at that time.

12.0 MOTIVATION OF PEOPLE

As per Govt. resolution of 1993, the villagers of neighboring villages have to be involved in protection of plantation raised under compensatory scheme. For this purpose, meeting will be conducted and V.S.S will be constituted. To improve the people in this direction they will be provided with incentives in shape of different community articles, buildings. Health camps shall also be organized in the village.

Success of any plantation the willingness of the villagers is essential. So the villagers will be taken into confidence about the benefit and medicinal value of the plantation.

13.0 INSPECTION, MONITORING & EVALUATION

To have this Afforestation scheme quite success, intensive inspection of the plantation by forest field staff and the officers at the divisional level is badly necessary. Moreover, frequently monitoring & evaluation shall have to be done at different fuel and cost of wear & tear of the Govt. vehicles to be used for inspection of nursery and plantation.

14.0 CONTROL

The nursery journal, the plantation journal and other records shall be maintained 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.

15.0 EXECUTIVE AGENCY

The Divisional Forest Officer, Sundargarh forest division through his staff will execute the scheme as per fund deposited by the user agency. The Infrastructure facility of course will be purchased by the user agency and supplied to the DFO Sundargarh division.

16.0 FUNDING AGENCY:

Orissa Integrated Power Ltd.

17.0 TOTAL FINANCIAL OUTLAY FOR THE SCHEME:

The total financial outlay of the scheme is **Rs.1,27,87,619 /-**

**Divisional Forest Officer
Sundargarh Division**

TOTAL FINANCIAL OUTLAY

| SI No. | PARTICULARS | AMOUNT (Rs.) |
|--------|---|-----------------------|
| 1. | Cost of Block Plantation and its maintenance for 10 years @ Rs. 92,600/- per ha. | 16,05,406.00 |
| 2. | Barbed wire Fencing over 2.15 km | 17,17,850.00 |
| 3. | Special Conservation Measures over 17.337 Ha | |
| | i. Loose Boulder Structure Span – 1 mt. @ 3591/- X 4 = 14,364/- | |
| | ii. Loose Boulder Structure Span – 2 mt. @ 7119/- X 3 = 21,357/- | |
| | iii. Loose Boulder Structure Span – 3 mt @ 14931/- X 2 = 29,862/- | |
| | Total Loose Boulder Structure (S.C.M) | 65,583.00 |
| 4. | Staggered Trench of size 2 mtr x 0.5 mtr x 0.5 mtr along with Avage Plant on the dugout soil for 2.15 km | 67,510.00 |
| 5. | Cost of protection (watchers) for 10 years (Rs. 6000 per month x 12 month x 10 watchers x 10 years) | 72,00,000.00 |
| | Sub Total | 1,06,56,349.00 |
| 6 | Cost of price escalation @ 20 % | 21,31,270.00 |
| | Grand Total Financial Outlay for Scheme | 1,27,87,619.00 |

(Rupees One Crore Twenty Seven Lakhs Eighty Seven Thousand Six Hundred Nineteen Only)

**Divisional Forest Officer
Sundargarh Division**

DETAILS ESTIMATE FOR BARBED WIRE FENCING

| Sl.No | Particulars | Amount (Rs.) |
|--|--|---------------------|
| 1 | Cost of One Pillar | 568.00 |
| 2 | Transportation charges to the side | 244.00 |
| 3 | Cost of base fixing | 325.00 |
| 4 | Cost for fixing barbed wire @ Rs.65 / rmt. | 65.00 |
| 5 | Total Cost of fixing one pillar (Sl 1 – 5) | 1,202.00 |
| 6 | Cost of fixing 500 pillars in one KM | 6,01,000.00 |
| 7 | Cost of 15 quintals of barbed wire (5+2 strand) @ Rs.13,200/- per quintal | 1,98,000.00 |
| 8 | Total Cost of fencing per KM | 7,99,000.00 |
| 9 | Barbed wire fencing over 2.15 Kms @ 7,99,000 per Km | 17,17,850.00 |
| Total cost of barbed wire fencing | | 17,17,850.00 |

Divisional Forest Officer
Sundargarh Division

ANNEXURE – G**COST ESTIMATE FOR BLOCK PLANTATION OF 1600 SEEDLINGS/PER HECT.**

| | | |
|---|--|--|
| 1 | Type of the Plantation | Block Plantation |
| 2 | No. of seedlings to be planted | 1600 Nos. per hectare |
| 3 | Spacing to be adopted | 2.5 m x 2.5 m |
| 4 | Size of pits | 30 cm x 30 cm x30 cm |
| 5 | Wage rate | Rs. 200.00 per Man day |
| 6 | Species to be planted | 1. Tectona grandis (Teak) 2. Pongamia piñata (Karanja) 3. Azadiracta indica (Neem) 4. Pterocarpus marsupium (Bija) 5. Emblic officinalis (Amla) 6. Terminalia belerica (Bahada) 7. Terminlia chebula (harida) 8. Dalbergia latifolia (Pahadi Sissoo) 9. Gmelina arborea (Gambhar) 10. Terminalia tomentosa (Asan) |
| 7 | The user agency will pay the wage rate as and when enhanced. | |

0th year (Advance work) Pre-Planting Operation.

| S.No. | Item of work | Mandays | Labour rate @ Rs. 200.00 | Material Cost. | Total |
|------------------|--|------------|-----------------------------|-------------------|------------------|
| 1 | Survey, Demarcation & pillar posting | 2 | 400.00 | | 400.00 |
| 2 | Site preparation | 8 | 1600.00 | | 1600.00 |
| 3 | Alignment and stacking of pits | 2 | 400.00 | | 400.00 |
| 4 | Digging of Pitting (30 cm.cube) | 40 | 8000.00 | | 8000.00 |
| 5 | Nursery cost (eight month old seedling) part | 80 | 8000.00 | 8000.00 | 16000.00 |
| Sub Total | | 132 | 18,400.00 | 8,000.00 | 26,400.00 |

| S.No. | Item of work | Mandays | Labour rate @ Rs. 200.00 | Material Cost. | Total |
|--|--|------------|-----------------------------|-------------------|------------------|
| 1st year/Planting | | | | | |
| 6 | Nursery cost (eight month old seedling) balance | 16 | 2800.00 | 400.00 | 3200.00 |
| 7 | Carriage & planting, CR, manuring, insecticides appln | 21 | 4200.00 | | 4200.00 |
| 8 | Cost of insecticide & Fertilizer | 21 | 0.00 | 4200.00 | 4200.00 |
| 9 | 1st weeding (complete weeding) | 7 | 1400.00 | 0.00 | 1400.00 |
| 10 | Manuring | 5 | 1000.00 | 0.00 | 1000.00 |
| 11 | 2nd Weeding (complete weeding) | 5 | 1000.00 | 0.00 | 1000.00 |
| 12 | Soil working (50 cm radius around plants) | 7 | 1400.00 | 0.00 | 1400.00 |
| 13 | Fireline Tracing & inspection path | 3 | 600.00 | 0.00 | 600.00 |
| 14 | Soil conservation measures in the form of staggered trenches of 2 mt.L x 50 cm D | 10 | 2000.00 | 0.00 | 2000.00 |
| 15 | Watch & ward | 7 | 1400.00 | 0.00 | 1400.00 |
| Sub Total | | 102 | 15,800.00 | 4,600.00 | 20,400.00 |
| 2nd year Maintenance | | | | | |
| 16 | Casualty replacement with nursery cost | 12 | 2400.00 | 0.00 | 2400.00 |
| 17 | Weeding (complete weeding) | 6 | 1200.00 | 0.00 | 1200.00 |
| 18 | Application of Fertilizer | 4 | 800.00 | 0.00 | 800.00 |
| 19 | Cost of Fertilizer | 12 | 0.00 | 2400.00 | 2400.00 |
| 20 | Soil working (50 cm radius around plants) | 7 | 1400.00 | 0.00 | 1400.00 |
| 21 | Fireline tracing (2 m wide fire line over 400 m long) | 3 | 600.00 | 0.00 | 600.00 |
| 22 | Watch and ward | 15 | 3000.00 | 0.00 | 3000.00 |
| Sub Total | | 59 | 9,400.00 | 2,400.00 | 11,800.00 |
| 3rd year Maintenance | | | | | |
| 23 | Weeding and application of fertilizer | 7 | 1400.00 | 0.00 | 1400.00 |

| S.No. | Item of work | Mandays | Labour rate @ Rs. 200.00 | Material Cost. | Total |
|---|---|-----------|-----------------------------|-------------------|-----------------|
| 24 | Cost of Fertilizer | 12 | 0.00 | 2400.00 | 2400.00 |
| 25 | Soil working (50 cm radius around plants) | 7 | 1400.00 | 0.00 | 1400.00 |
| 26 | Fire line tracing (2 m wide fire line over 400 m long) pruning | 3 | 600.00 | 0.00 | 600.00 |
| 27 | Watch and ward | 15 | 3000.00 | 0.00 | 3000.00 |
| Sub Total | | 44 | 6,400.00 | 2,400.00 | 8,800.00 |
| 4th year Maintenance | | | | | |
| 28 | Fire line tracing (2 m wide fire line over 400 m long) pruning | 3 | 600.00 | 0.00 | 600.00 |
| 29 | Watch and ward | 15 | 3000.00 | 0.00 | 3000.00 |
| Sub Total | | 18 | 3,600.00 | 0.00 | 3,600.00 |
| 5th year Maintenance | | | | | |
| 30 | Fire line tracing (2 m wide fire line over 400 m long) pruning | 3 | 600.00 | 0.00 | 600.00 |
| 31 | Watch and ward | 15 | 3000.00 | 0.00 | 3000.00 |
| Sub Total | | 18 | 3,600.00 | 0.00 | 3,600.00 |
| 6th year Maintenance | | | | | |
| 32 | Fire line tracing (2 m wide fire line over 400 m long) pruning | 3 | 600.00 | 0.00 | 600.00 |
| 33 | Watch and ward | 15 | 3000.00 | 0.00 | 3000.00 |
| Sub Total | | 18 | 3,600.00 | 0.00 | 3,600.00 |
| 7th year maintenance. | | | | | |
| 34 | Fire line tracing (2 m wide fire line over 400 m long) pruning | 3 | 600.00 | 0.00 | 600.00 |
| 35 | Watch and ward | 15 | 3000.00 | 0.00 | 3000.00 |
| Sub Total | | 18 | 3,600.00 | 0.00 | 3,600.00 |
| 8th year maintenance. | | | | | |
| 36 | Fire line tracing (2 m wide fire line over 400 m long) pruning | 3 | 600.00 | 0.00 | 600.00 |
| 37 | Watch and ward | 15 | 3000.00 | 0.00 | 3000.00 |

| S.No. | Item of work | Mandays | Labour rate @ Rs. 200.00 | Material Cost. | Total |
|--|--|------------|-----------------------------|-------------------|------------------|
| Sub Total | | 18 | 3,600.00 | 0.00 | 3,600.00 |
| 9th year maintenance. | | | | | |
| 38 | Fire line tracing (2 m wide fire line over 400 m long) pruning | 3 | 600.00 | 0.00 | 600.00 |
| 39 | Watch and ward | 15 | 3000.00 | 0.00 | 3000.00 |
| Sub Total | | 18 | 3,600.00 | 0.00 | 3,600.00 |
| 10th year maintenance. | | | | | |
| 40 | Fire line tracing (2 m wide fire line over 400 m long) pruning | 3 | 600.00 | 0.00 | 600.00 |
| 41 | Watch and ward | 15 | 3000.00 | 0.00 | 3000.00 |
| Sub Total | | 18 | 3,600.00 | 0.00 | 3,600.00 |
| Grand Total | | 463 | 75,200.00 | 17,400.00 | 92,600.00 |

ABSTRACT FOR @1600/- SEEDLINGS PER HA.

| Year | Mandays | Labour Cost | Materials | Total |
|-----------------------|----------------|--------------------|------------------|---------------|
| 0 th Year | 132 | 18,400.00 | 8,000.00 | 26,400.00 |
| 1 st Year | 102 | 15,800.00 | 4,600.00 | 20,400.00 |
| 2 nd year | 59 | 9,400.00 | 2,400.00 | 11,800.00 |
| 3 rd year | 44 | 6,400.00 | 2,400.00 | 8,800.00 |
| 4 th year | 18 | 3600.00 | 0.00 | 3600.00 |
| 5 th Year | 18 | 3600.00 | 0.00 | 3600.00 |
| 6 th year | 18 | 3600.00 | 0.00 | 3600.00 |
| 7 th year | 18 | 3600.00 | 0.00 | 3600.00 |
| 8 th year | 18 | 3600.00 | 0.00 | 3600.00 |
| 9 th year | 18 | 3600.00 | 0.00 | 3600.00 |
| 10 th year | 18 | 3600.00 | 0.00 | 3600.00 |
| Total | 463 | 75,200 | 17,400 | 92,600 |

Total cost of Block plantation per ha. for 1600 seedlings = Rs. 92,600.00

Therefore cost of Plantation over 17.337 ha. = Rs 16,05,406.00

Prepared by

**Divisional Forest Officer
Sundargarh Division**

ANNEXURE - H

Estimate for digging of Staggered Trench of size 2 Mtr X 0.5 X 0.5 Mtr along with Agave plant on the dug out soil.

| SI | Description of work | Amount in Rs. |
|------|--|------------------|
| (i) | Earth work in excavation if staggered trench in hard soil including Rough dressing and leveling the beds and heaping the dugout soil at the downhill side of the trench and leveling the same too. | |
| | Size of a trench = 2.0 Mtr X 0.5 X 0.5 Mtr =, 0.5 Cum @ 395 per 2.83 Cum | 70.00 |
| (ii) | Cost of agave planting on the dugout soil and its maintenance including weeding, soil working, manuring, cost of fertilizer etc. for ten year. | |
| | 03 nos. of average plants per trench @ Rs. 29.000 per plant on LS | 87.00 |
| | TOTAL | 157.00 |
| | Cost of 200 nos. of staggered Trenches per Km (200 X 157) | 31,400.00 |
| | Total cost for staggered trenches over 2.15 km @ 31,400/- | 67,510.00 |

**Divisional Forest Officer
Sundargarh Division**

ANNEXURE - Ia**I. Detail Estimate of Loose Boulder Structure (S.C.M.)**

Span-1 mt. Ht. = 0.6 mt. Slope-U/S:- 1:1.5 D/S slope: 1:2

Geo-Coordinate of the four LBS

| LBS SI No | North | East |
|-----------|----------------|----------------|
| 1 | 22° 04' 38.80" | 83° 59' 47.10" |
| 2 | 22° 04' 30.00" | 83° 59' 39.30" |
| 3 | 22° 04' 24.00" | 83° 59' 34.20" |
| 4 | 22° 04' 26.10" | 22° 04' 43.10" |

| | | | |
|---|--|--------------|------------------------------|
| 1. Leveling the unshaped surface of the selected site & layout the structure foundation L.S. 1 MD. | | | Rs. 200.00 |
| 2. Excavation of foundation in hard soil within initial lead of 50 mtr. Including rough dressing and breaking of clods to maximum size 5 cm. to 7 cm. laying in layer not exceeding 0.3 in depth to strengthening both side U/S approx. bund of loose boulder structure. Base with apron- $1 \times 3.60 \times 1.60 \times 0.30 =$ Wing wall – $4 \times 0.50 \times 0.30 \times 0.30 =$ @ Rs. 8890.00 per 100 cum | 1.728 <u>0.180</u> cum | 1.908 | Rs. 170.00 |
| 3. Rough stone dry packing up to GL Base with apron – $1 \times 3.60 \times 1.60 \times 0.30 =$ Wing wall – $4 \times 0.50 \times 0.30 \times 0.30 =$ Above GL Super structure - $1 \times 1.00 \times \frac{2.60 + 0.50}{2} \times 0.60$ Wing wall – $4 \times 0.50 \times 0.30 \times 0.30 =$ Side wall- i. $2 \times \frac{0.3+0.9}{2} \times 0.3 =$ ii. $2 \times 0.3 + \frac{0.9 \times 1.2}{2} \times 0.3 =$ iii. $2 \times 0.5 \times 0.9 \times 0.3 =$ iv. $2 \times 1.0 \times 0.3 \times 0.3 =$ @Rs. 762.53 per cum | 1.728 <u>0.180</u> cum 0.930 0.180 0.324 0.432 0.270 0.180 <u>2.316 cum</u> 4.224 cum | 1.908 | Rs. 3221.00 |
| | | | G. Total Rs. 3,591.00 |

(Rupees Three Thousand Five Hundred Ninety One) only

**Divisional Forest Officer,
Sundargarh Forest Division**

II. Detail Estimate of Loose Boulder Structure (S.C.M.)

Span - 2 mt. Ht. = 0.6 mt. Slope-U/S:- 1:1.5 D/S slope: 1:2

Geo-Coordinate of the three LBS

| LBS SI No | North | East |
|------------------|-----------------------|-----------------------|
| 1 | 22° 04' 34.76" | 83° 59' 43.70" |
| 2 | 22° 04' 25.00" | 83° 59' 39.60" |
| 3 | 22° 04' 27.90" | 83° 59' 46.10" |

| | | |
|--|--|----------------------------------|
| 1. Leveling the unshaped surface of the selected site & layout the structure foundation L.S. 1 MD | | Rs. 2,00.00 |
| 2. Excavation of foundation in hard soil within initial lead of 50 mtr. including rough dressing and breaking of clods to maximum size 5 cm. to 7 cm. laying in layer not exceeding 0.3 in depth to strengthening both side U/S approx. bund of loose boulder structure. Base with apron- $1 \times 3.70 \times 3.00 \times 0.30 =$ Wing wall – $4 \times 0.50 \times 0.50 \times 0.30 =$ @ Rs. 8890.00 per 100 cum | 3.33 <u>0.30</u> cum 3.63 | Rs. 3,23.00 |
| 3. Rough stone dry packing up to GL Base with apron – $1 \times 3.70 \times 3.00 \times 0.30 =$ Wing wall – $4 \times 0.50 \times 0.50 \times 0.30 =$ Above GL Super structure- $1 \times 2.00 \times \frac{2.70 + 0.60}{2} \times 0.6$ Wing wall – $4 \times 0.50 \times 0.50 \times 0.50 =$ Side wall- i. $2 \times \frac{0.50 + 1.10}{2} \times 0.9 \times 0.5 =$ ii. $2 \times \frac{0.5 + 1.10}{2} \times 1.2 \times 0.5 =$ iii. $2 \times 0.6 \times 0.6 \times 0.5 =$ iv. $2 \times 1.0 \times 0.5 \times 0.5 =$ @ Rs. 762.53 per cum | 3.33 0.30 1.98 0.50 0.72 0.96 0.36 <u>0.50</u> 8.65 cum | Rs. 6,596.00 |
| | | G. Total Rs. 7,119.00 |

(Rupees Seven Thousand One Hundred Nineteen) only

**Divisional Forest Officer,
Sundargarh Forest Division**

III. Detail Estimate of Loose Boulder Structure (S.C.M.)

Span- 3 mt. Ht. = 1.0mt. Slope-U/S:- 1:1.5 D/S slope: 1:2.0

Geo-Coordinate of the two LBS

| LBS SI No | North | East |
|------------------|-----------------------|-----------------------|
| 1 | 22° 04' 31.00" | 83° 59' 52.80" |
| 2 | 22° 04' 32.60" | 83° 59' 42.80" |

| | | |
|---|--|------------------------------|
| 1 Leveling the unshaped surface of the selected site & layout the structure foundation L.S. 1 MD | | Rs.200.00 |
| 2 Excavation of foundation in hard soil within initial lead of 50 mtr. including rough dressing and breaking of clods to maximum size 5 cm. to 7 cm. laying in layer not exceeding 0.3 in depth to strengthening both side U/S approx. bund of loose boulder structure. Base with apron- $1 \times 5.10 \times 4.00 \times 0.30 =$ Wing wall – $4 \times 0.50 \times 0.50 \times 0.30 =$ @ Rs. 8890.00 per 100 cum | 6.12 0.30 cum 6.42 | Rs. 571.00 |
| 3 Rough stone dry packing up to GL Base with apron – $1 \times 5.10 \times 4.00 \times 0.30 =$ Wing wall – $4 \times 0.50 \times 0.50 \times 0.30 =$ Above GL Super structure- $1 \times \frac{4.10 + 0.60}{2} \times 1.00 \times 3.0$ Wing wall – $4 \times 0.50 \times 0.50 \times 0.50 =$ Side wall- i. $2 \times \frac{0.50 + 1.50}{2} \times 1.5 \times 0.5 =$ ii. $2 \times \frac{0.5 + 1.50}{2} \times 2.0 \times 0.5 =$ iii. $2 \times 0.6 \times 1.0 \times 0.5 =$ iv. $2 \times 1.0 \times 0.5 \times 0.5 =$ @ Rs. 762.53 per cum | 6.12 0.30 7.05 0.50 1.50 2.00 0.60 0.50 18.57 cum | Rs.14160.00 |
| | | G. Total Rs. 14931.00 |

(Rupees Fourteen Thousand Nine Hundred Thirty One) only

**Divisional Forest Officer,
Sundargarh Forest Division**