

COMPENSATORY AFFORESTATION SCHEME

FOR

TALCHER-DUBURI-CHANDIKHOLE SECTION (NH-200)

SCHEME FOR COMPENSATORY AFFORESTATION (RDF) IN DEGRADED FOREST LAND OVER AN AREA OF 210.916 HA IN MADHI RF OF KAMAKHYA NAGAR WEST RANGE IN LIEU OF FOR FOREST DIVERSION PROPOSAL FOR TALCHER-DUBURI-CHANDIKHOLE SECTION OF NH-200 OVER 105.456 HA OF ANGUL, DHENKANAL AND CUTTACK FOREST DIVISIONS.

1. INTRODUCTION

The project road starts from Balar Chowk junction at Talcher Km 8.500 of NH-23 (301.890 of NH-200) proceeding to Pitiri junction of NH-23 ,near Km 302.000 of NH-200(15.205 of NH-23) and goes up to and end Km. 428.030, the junction with NH-5 in Chandikhole town. Total length of road from Talcher to Chandikhole including 6.705 Kms length of NH-23 (Talcher to Pitiri junction), known as the missing link, 132.515 Km (say 133.00).

The Existing carriageway is a mixture of two-lane, intermediate lane and single lane and it is proposed to widen to 2/4 lane. Paved shoulders and earthen shoulders have been proposed to be 1.5 mt and 1.0 mt wide respectively. Toll plazas have been proposed to be at Pitiri junction (Km15.0) and at Km 399.00. Truck parking has been proposed at Balar Chowk (Km 9.0) and Km 426.0. Earthen and masonry drains will be provided for stretches having problems of drainage. The options of concentric widening and widening to the left or right hand side have been considered for the project so as to utilize the existing ROW as far as possible with the object of minimization of acquisition of additional land. The existing ROW varies between 13.0 mt and 22.0 mt against the proposed ROW 60 mt. Total 69 no. of village falls on proposed alignment and total benefited population would be 15324888. Total 57 villages out of 69 villages falls in Dhenkanal Forest Division. Project will provide 2.25 lakh man days direct employment. The road has mixed traffic of slow and fast moving vehicles. The quarries, haul road and borrow areas have not been located in any Reserve or Protected Forest.

The project evolves 105.458 ha of forest land in Angul, Dhenkanal & Cuttack Forest Division. In lieu of this 105.458 ha x 2= 210.916 ha degraded Forest land has been identified for raising

Compensatory afforestation in assisted Natural Regeneration with Gap planting in Madhi RF comprising two patches i.e 162 ha and 49 ha respectively near village Jantankhol & Gundichanoli of patch - I & II

K.Nagar West Forest Range of Dhenkanal Division. The land schedule and map of sites are enclosed herewith

The Total area of Madhi RF is 417.70 ha, which is allotted to eco-restoration Working Circle. The Special object of management of this working circle areas detailed below:-

- (i) To improve the Condition of exiting forest through protection against grazing fire and illicit felling.
- (ii) To enhance soil productivity through soil and moisture conservation measure.
- (iii) To stabilize ration between water run-off during rainy session and that of during dry season.
- (iv) To restock barren areas through artificial regeneration of most desirable indigenous species.
- (v) To involve the local community in protection and management of the forest.
- (vi) To restore and improve the micro- climate an micro-edaphic condition.
- (vii) To increase the bio-diversity in the forest crop by encouraging natural regeneration.

This Compensatory afforestation area has been allotted to Madhi RF. The area over 210.916 ha has been identified for ANR with gap plantation is in Madhi RF. This area comes under Category II of the treatment series. These areas have gaps in between. Artificial regeneration with soil moisture conservation and strict supervision to eradicate any biotic interference for 10 years will improve the condition of the forest growth naturally found in the area


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2. ALLOCATION OF DEGRADED FOREST LAND FOR COMPENSATORY AFFORESTATION

The degraded forest land identified is mostly undulating ground which processed good growth of Misc. species but due to biotic interference like collection of firewood by the local stake holders, grazing and forest fire has degraded the foothills which need to be covered under bald hill plantation (2mtx2mt. spacing)

3. Description of existing vegetation

Some forest growth having 10-25% crown density existing in Madhi RF. The main species noticed are Sal (*Shorea robusta*), Asan (*Terminalia tomentosa*), Dhaura (*Anogeisus acuminate*), Kasi (*Bridelia retusa*), Mankada Kendu (*Diospyrus melanoxylon*), Karada, Bel (*Aegle marmelos*), Bahada (*Terminalia belerica*), Kochila (*Strychnos nux-vomica*), Sunari (*Cassia fistula*), Cane, Kalucha, Nahalbeli, Chatian (*Alstonia scholaris*), Khajuri, Amla(*Emblca officinalis*), Kaju, etc.

4. Topographic & soil

The site is shown in Topo-sheet Number 73H/09. The soil type occurring in the area is shallow, somewhat exclusively drained, gravelly loamy soil on moderately hill slopes with loamy surface, susceptible to erosion associated with deep and well drained.

5. Climatic Condition

The climate condition of the area favouring growth of dry deciduous forest having average annual rainfall of 75-100 cm and maximum temperature 45degree C. The summer season is from March to June, winter from November to February and rainy season is from July to September.

6. Objective of the Scheme

It is mandatory requirement under the Provision of FC Act, 1980.

- (a) To replenish the loss of forest land to be diverted for non- forestry purpose, i.e. for widening of NH-200 from Talcher to Chandikhoe via Kamakhya Nagar & Duburi.
- (b) To generate employment to the villagers living around the area.
- (c) To increase the ground water table through soil & moisture conservation.
- (d) To increase the bio-diversity for improvement of the local ecology.

- (e) To fulfill the requirement of fuel wood and small timber of the local inhabitants.
- (f) To provide a green clothing to the area by means of artificial regeneration or plantation in order to reduce soil erosion.

7. Eco restoration operation

- (a) All high stumps are to be removed.
- (b) Coppice with multiple shoots should be singled out by retaining the sound ones.
- © Complete protection against fire, grazing & illicit felling shall be ensured.
- (d) The area should be managed under JFM mode, i.e. involving local VSS members from inception of this project.
- (e) The indigenous hardy species as shown in the choice of species should be preferred for artificial regeneration.
- (f) Preference should be given to species suitable for elephant fodder.

8. Plantation Technique

The area should be well demarcated before raising plantation by GPS survey. A map should be prepared and followed for execution of the plantation basing on the soil depth. Preferably indigenous species are to be planted coupled with soil & moisture conservation measures.

9. Choice of species

Considering the edaphic & micro climatic conditions of the site, the following species are recommended.

| Common Name | Scientific name | Suitable for |
|-------------|-----------------------|-------------------------|
| Simuli | Bombax ceiba | ANR with gap plantation |
| Sissoo | Dalbergia sissoo | -do- |
| Bija | Pterocarpus marsupium | -do- |
| Asana | Terminalia tomentosa | -do- |
| Neem | Azadirachta indica | -do- |
| Karanja | Pongamia pinnata | -do- |

| | | |
|------------|-------------------------|------|
| Bamboo | Dendrocalamus strictus | -do- |
| Jack fruit | Artocarpus hetrophyllus | -do- |
| Amla | Emblica officinalis | -do- |
| Bara | Ficus bengalensis | -do- |
| Bel | Aegle marmelos | -do- |
| Kaitha | Limoniaa acidissima | -do- |
| Mango | Mangifera indica | -do- |
| Jari | Ficus benjamins | -do- |
| Jamun | Syzigium cuminii | -do- |

10. Survey & Demarcation

The area should be clearly surveyed by GPS in the field with reference to the map to ascertain the exact area available for plantation. The masonry pillars of 4 feet height should be erected on the boundary of the site preferably on the curvatures painted in white colour & the pillar number with GPS reading, i.e., latitude & longitude has to be written on the pillars in black.

The plantation area needs to be indicated by sign boards at corners or point of intersection with artifacts like roads, inspection paths & boundary lines. The sign board should contain the names of plantation site, area, year of planting, planting module, number of seedlings planted and other details if necessary.


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COST NORM FOR ASSISTED NATURAL REGENERATION (ANR) WITH GAP PLANTATION PER HECTARE (300 SEEDLINGS)

Cost norm for assisted natural regeneration (ANR) with gap plantation (300 seedlings per ha)

0th year (Advance work) Pre-planting operation

| Sl. No | Items of work | Man-days per ha | Labour rate @Rs. 200/- | Materials cost in Rs. | Total cost in Rs. |
|--|--|-----------------|------------------------|-----------------------|-------------------|
| 1 | Survey, demarcation & pillar posting | 2 | 400.00 | 0 | 400.00 |
| 2 | Site preparation | 2 | 400.00 | 0 | 400.00 |
| 3 | Cutting of high stumps | 3 | 600.00 | 0 | 600.00 |
| 4 | Alignment and stacking of pits | 1 | 200.00 | 0 | 200.00 |
| 5 | Pitting(30 Cm cube) | 8 | 1600.00 | 0 | 1600.00 |
| 6 | Cost of raising 300 seedlings (Part) | 14 | 1600.00 | 1200.00 | 2800.00 |
| | Sub Total | 30 | 4800.00 | 1200.00 | 6000.00 |
| 1st year/Planting | | | | | |
| 7 | Cost of raising 300 seedlings(Balance) | 6 | 1200.00 | 0 | 1200.00 |
| 8 | Carriage of seedlings to site including causality replacement | 6 | 1200.00 | 0 | 1200.00 |
| 9 | 1 st weeding | 2 | 400.00 | 0 | 400.00 |
| 10 | 2 nd weeding | 2 | 400.00 | 0 | 400.00 |
| 11 | Soil working | 2 | 400.00 | 0 | 400.00 |
| 12 | Manuring/Insecticide application | 1 | 200.00 | 0 | 200.00 |
| 13 | Fire line tracing & inspection path | 2 | 400.00 | 0 | 400.00 |
| 14 | Cost of insecticides for plantation | 3 | 0 | 600.00 | 600.00 |
| 15 | Cost of chemical fertilizer for plantation 12 Kg @ Rs. 35/- with transportation, etc | 6 | 0 | 1200.00 | 1200.00 |
| 16 | Silvicultural operation involving clearance of weed and cutting of climbers, singling of shoots, etc | 15 | 3000.00 | 0 | 3000.00 |
| 17 | Soil Conservation | 12 | 2400.00 | 0 | 2400.00 |
| 18 | Watch & ward | 5 | 1000.00 | 0 | 1000.00 |
| 19 | Contingencies | 3 | 0 | 0 | 600 |
| | Sub Total | 65 | 13000.00 | 1800 | 14800.00 |
| 2nd Year Maintenance | | | | | |
| 20 | Causality replacement | 2 | 400.00 | 0 | 400.00 |
| 21 | Weeding | 2 | 400.00 | 0 | 400.00 |
| 22 | Soil working and manuring | 2 | 400.00 | 0 | 400.00 |
| 23 | Fire Line Tracing | 1 | 200.00 | 0 | 200.00 |
| 24 | Cost of fertiliser | 4 | 0 | 800.00 | 800.00 |
| 25 | Soil Conservation | 6 | 1200.00 | 0 | 1200.00 |
| 26 | Watch & ward | 8 | 1600.00 | 0 | 1600.00 |
| 27 | Contingencies | 2 | 0 | 0 | 400.00 |
| | Sub Total | 27 | 5400.00 | 800.00 | 6200.00 |
| 3rd year Maintenance | | | | | |
| 28 | Weeding & pruning | 2 | 400.00 | 0 | 400.00 |
| 29 | Soil working | 2 | 400.00 | 0 | 400.00 |
| 30 | Fire line tracing | 1 | 200.00 | 0 | 200.00 |
| 31 | Soil Conservation | 6 | 1200.00 | 0 | 1200.00 |

| | | | | | |
|--|---|------------|-----------------|----------------|-----------------|
| 32 | Watch & ward | 6 | 1200.00 | 0 | 1200.00 |
| 33 | Contingencies | 2 | 400.00 | 0 | 400.00 |
| | Sub total | 19 | 3800.00 | 0 | 3800.00 |
| 4th year Maintenance | | | | | |
| 34 | Weeding & pruning | 2 | 400.00 | 0 | 400.00 |
| 35 | Fire line tracing (2 mt wide fire line over 600 mt long) | 1 | 200.00 | 0 | 200.00 |
| 36 | Watch & ward | 6 | 1200.00 | 0 | 1200.00 |
| 37 | Contingencies | 1 | 200.00 | 0 | 200.00 |
| | Sub total | 10 | 2000.00 | 0 | 2000.00 |
| 5th year Maintenance | | | | | |
| 38 | Weeding & pruning | 2 | 400.00 | 0 | 400.00 |
| 39 | Fire line tracing (2 mt wide fire line over 600 mt long) | 1 | 200.00 | 0 | 200.00 |
| 40 | Watch & ward | 6 | 1200.00 | 0 | 1200.00 |
| 41 | Contingencies | 1 | 200.00 | 0 | 200.00 |
| | Sub total | 10 | 2000.00 | 0 | 2000.00 |
| 6th year Maintenance | | | | | |
| 42 | Weeding & pruning | 2 | 400.00 | 0 | 400.00 |
| 43 | Fire line tracing (2 mt wide fire line over 600 mt long) | 1 | 200.00 | 0 | 200.00 |
| 44 | Watch & ward | 6 | 1200.00 | 0 | 1200.00 |
| 45 | Contingencies | 1 | 200.00 | 0 | 200.00 |
| | Sub total | 10 | 2000.00 | 0 | 2000.00 |
| 7th year Maintenance | | | | | |
| 46 | Weeding & pruning | 2 | 400.00 | 0 | 400.00 |
| 47 | Fire line tracing (2 mt wide fire line over 600 mt long) | 1 | 200.00 | 0 | 200.00 |
| 48 | Watch & ward | 6 | 1200.00 | 0 | 1200.00 |
| 49 | Contingencies | 1 | 200.00 | 0 | 200.00 |
| | Sub total | 10 | 2000.00 | 0 | 2000.00 |
| 8th year Maintenance | | | | | |
| 50 | Weeding & pruning | 2 | 400.00 | 0 | 400.00 |
| 51 | Fire line tracing (2 mt wide fire line over 600 mt long) | 1 | 200.00 | 0 | 200.00 |
| 52 | Watch & ward | 6 | 1200.00 | 0 | 1200.00 |
| 53 | Contingencies | 1 | 200.00 | 0 | 200.00 |
| | Sub total | 10 | 2000.00 | 0 | 2000.00 |
| 9th year Maintenance | | | | | |
| 54 | Weeding & pruning | 2 | 400.00 | 0 | 400.00 |
| 55 | Fire line tracing (2 mt wide fire line over 600 mt long) | 1 | 200.00 | 0 | 200.00 |
| 56 | Watch & ward | 6 | 1200.00 | 0 | 1200.00 |
| 57 | Contingencies | 1 | 200.00 | 0 | 200.00 |
| | Sub total | 10 | 2000.00 | 0 | 2000.00 |
| | Grand Total | 201 | 39000.00 | 3800.00 | 42800.00 |


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ABSTRACT

| Year | Labour cost in Rs. | Material cost in Rs. | Contingencies in Rs. | Total cost in Rs. |
|--|--------------------|----------------------|----------------------|-------------------|
| 0 th year | 4800.00 | 1200.00 | 0 | 6000.00 |
| 1 st year | 12400.00 | 1800.00 | 600.00 | 14800.00 |
| 2 nd year | 5000.00 | 800.00 | 400.00 | 6200.00 |
| 3 rd year | 3600.00 | 0 | 400.00 | 3800.00 |
| 4 th year | 1800.00 | 0 | 200.00 | 2000.00 |
| 5 th year | 1800.00 | 0 | 200.00 | 2000.00 |
| 6 th year | 1800.00 | 0 | 200.00 | 2000.00 |
| 7 th year | 1800.00 | 0 | 200.00 | 2000.00 |
| 8 th year | 1800.00 | 0 | 200.00 | 2000.00 |
| 9 th year | 1800.00 | 0 | 200.00 | 2000.00 |
| Total | 36600.00 | 3800.00 | 2400.00 | 42800.00 |
| Person days equivalent | 183 | 19 | 12 | |
| Additional incentives (3%) for VSS/Fr/FG proposed for more than 80% survival and very good growth during 4 th year of maintenance as per recommendation of DFO & RCCF | | | | 1284.00 |
| Additional EPA expenses if implemented through VSS @Rs. 1500/- in 0 th year, Rs. 2700/- in 1 st year, Rs. 2100/- in 2 nd year, Rs. 900/- in 3 rd year, Rs. 900/- in 4 th year, Rs. 900/- in 5 th year, Rs. 900/- in 6 th year, Rs. 900/- in 7 th year, Rs. 900/- in 8 th year, Rs. 900/- in 9 th year. | | | | 13500.00 |
| Total norm per ha with incentives | | | | 57584.00 |


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NURSERY

- (A) A good nursery is the pre-requisite for a successful plantation. All care should be taken to raise healthy & sound seedlings of required sizes before they are put to plantation size. Planting of one year one year old seedling of above species shall be taken up. Nursery programme must be planned out as per the Guidelines in the plantation manual so that a good stock of healthy seedlings can be raised. 10% extra seedlings be raised to cover the shortfall due to casualty in the nursery stage.
- (B) The temporary nursery should be raised near the plantation site as far as practicable.
- (C) A good variety of local seeds should be collected.
- (D) Proper treatment of seeds should be done as per the manual.
- (E) Shifting of polythene bags one seedling is recommended not only to develop resistance for isolation but not allow the roots striking into the ground soil.

PROTECTION

The important element of successful plantation is protection. Watchers are to be engaged on daily wage basis for 5 years.

CONTROL

- (A) The nursery journal, plantation journal and other records shall be maintained separately in accordance with the provision of "The Orissa Forest Plantation Manual 1977" indicating the physical & financial achievement. Necessary entries with regard to plantation activities undertaken shall be entered in the journals and shall be produced before the inspecting officer. In case of any eventuality like cyclone, thunder storm, hail storm, etc. if caused destruction to the plantation, this should also be noted. It is also necessary to note the distribution of rain fall which not only helps in the growth of plants at site but also acts as a guide line for the ensuing years nursery schedule to be formulated.
- (B) For protection, measures shall be taken to save the plantation from fire incidents & prevent accidental trespass of cattle, goat, etc to the premises of the nursery. Boundary area will be scrapped to a width of 2mt during February/March and the cut materials are to be burnt under strict supervision. The inspection path around 4 Ha plot shall have to be laid out and weed growth are to be scrapped.


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SOIL & WATER CONSERVATION METHOD

It is to be taken up the soil and moisture conservation work. Small gullies are to be plugged by the live plants. Either area will be dried out quickly water conservation measures will be taken by digging staggered trenches. These trenches will be dug along the contour in a continuous manner. The dimension of the trenched will be 2.5 mt x 0.5 mt x 0.5 mt and dug out earth will be kept on the lower hill sides. It should be 300 numbers in an average per hectare. Staggered trenched are to be aligned 15 mt apart along the contour and 7.5 mt across the contour. In addition to above, leguminous seeds are to be sown in the inter space between the plants. Check dams are proposed to be constructed out of dry rubbles across the nallaha and gullies.

PEOPLES' PARTICIPATION

The local communities are to be involved for the protection of the plantation. The VSS is to be formed (If not formed earlier) and incentive to be given to the VSS for their active participation in protecting the plantation. Livelihood option and EPA are to be taken to improve the socio-economic status of the people living around the forest. For effective protection of area, watch and ward shall be provided during the project period (From inception to 10th year) and subsequently the plantation will be looked after by the VSS.

WATCH & WARD

Watchers (1 watcher for every 10 ha plantation) should be engaged round the year for 10 years starting from the day of inception of the plantation.

FUNDING AGENCY

The Project Director, National Highway authority of India, PIU Bhubaneswar will pay the cost afforestation in one lot for 210.916 ha for amounting Rs. 1,33,60,000.00 (Rs. One crore thirty lakh sixty thousand) only on receipt of demand notice from DFO, Dhenkanal Division. However, the PD will furnish an undertaking to pay any additional amount in case the wage rate is escalated between date of recommendation of this proposal & issue of Stage-II approval issued by MOEF & Climate Changes for diversion of forest land.

EXECUTING AGENCY

Divisional Forest Officer, Dhenkanal Forest Division.


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Dhenkanal Division**

MONITORING & EVALUATION

Divisional Forest Officer, Dhenkanal Forest Division shall monitor & evaluate the scheme periodically.

TOTAL FINANCIAL OUTLAY

(A) 210.916 ha x Rs. 57584/- = Rs. 1,21,45,387.00

(B) 10% M & E = Rs. 12,14,539.00

Rs. 1, 33, 59,926.00 or Rs. 1, 33, 60,000.00

(Rupees One Crore thirty three lakh sixty thousand) Only.



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