

Detailed scheme for Compensatory Afforestation to be carried out in lieu of 6.56 hectares of forest area proposed to be diverted for Construction of By-pass Road under Bolangir NH Division.

NH 201 and NH-224 are the only major roads passing through Bolangir Town which connect Boriguma, Khurda, Nowrangpur, Kalahandi, Bolangir, Subarnapur and Bargarh. The traffic intensity is very high throughout the run day and night. The existing NH-201 alignment traverses through Bolangir town with improper road geometries and inadequate formation width. Built up area being located on either side of the road; the roads do not have adequate drainage facility or scope to widen the road to standard two lane. The main aim is to propose bypass alignment for Bolangir to decrease the commercial traffic load of NH-201. NH-201 & 224 pass through Bolangir town with built up area on either side and meet at a level crossing at 299th KM of NH-224. Vehicles carrying forest product, agricultural product and heavy mines ply through Bolangir Township as there is no alternate arrangement for diversion of the traffic. Thus, it is felt necessary to provide ROB's with bypass road for both NH-201 and NH-224 for Bolangir Town for smooth movement of heavy traffic. The probable length of the proposed Bypass as assessed is approximately 11.663 KM in length which starts at 239 KM of NH-201 and meet NH-201 at 246.800 KM and cross NH-224 at 297 th KM by providing this bypass a length of 7.00 KM of NH-201 and 3.00 KM of NH can be eliminated. In the process of acquisition of land for construction of the proposed Bolangir Bypass as above, diversion of 6.56 ha of Forest land (Gramya Jungle) needs to be diverted as bare minimum necessity for the project.

The present scheme is an outcome of the adherence to the Para-2.4 (vi) of Forest Conservation Act, 1980 and Forest Conservation Rules, 2003 (Guidelines&Clarifications) by the Government of Odisha, Forest and Environment Department. As per the instructions, the Divisional Forest Officer is being empowered to demand the cost of plantation for taking of compensatory afforestation in lieu of diversion of Forest land equal to 1000 saplings per ha over the stretch of forest land diverted. The entire stretches of the road have been covered to ascertain the number of trees to be felled from both side of the road. As per the enumeration list a total of 1470 Nos of trees and 37 Nos of Bamboo Clumps will be felled in the process. As against diversion of 6.56 ha Forest land, Compensatory Afforestation will be taken up over 13.876 ha of suitable degraded Village Forest land @ 1000 Nos of saplings per ha coming to total 13876 Nos of saplings. User agency has already identified two patches totaling to 13.876 ha which will be handed over to the Forest Department.

The proposed CA land has been identified and Plantation will be taken up in Sindurbahal Village degraded forest land under Bolangir Forest Range over a stretch of 13.876 ha out of the gross area of 14 ha provided by the User Agency in two patches. Further, necessary alienation proposal has also been submitted to the Tahasildar, Bolangir vide this office letter No. 1028, Dtd. 04.02.2022 (Copy enclosed with Scheme). Besides, the individual patches of total CA land allotted in nine different villages were examined through Decision Support System and the analysis is given as below:

| Sl. No. | Name of the village | DSS Results | | Total area in ha |
|--------------|---|--------------------------------------|----------------|------------------|
| | | Open Forest or Non-Forest Area in ha | MDF Area in ha | |
| 1 | Sindurbahal Patch-1 (Gramya Jungle over Plot No. 372 and 371 over 6.997 ha | 6.997 | 0 | 6.997 |
| 2 | Sindurbahal Patch-2 (Gramya Jungle over Plot No. 383 and 372 over 6.997 ha | 6.879 | 0 | 6.879 |
| Total | | 13.876 | | 13.876 |

Considering the results of DSS and observations during field verification, the CA scheme over 13.876 hais now revised at the Current wage rate. Details of the CA scheme is given as under and the model of plantation will be taken up as 1000 plants / ha to compensate the loss of the trees in the area proposed for diversion. The DSS result is enclosed as **ANNEXURE-A**

| Name of the village | Type of Plantation | Area in ha | No. of seedlings to be planted per ha | Total no. of seedlings to be planted |
|---------------------|-------------------------------------|------------|---------------------------------------|--------------------------------------|
| Sindurbahal | Block Plantation @ 1000 Plants / ha | 13.876 ha | 1000 | 13876 |

The site-specific scheme is therefore prepared and its details are furnished below:-

1. Details of non-forest land: Enclosed as Annexure-B Series

The village maps showing the land details for the proposed compensatory afforestation are enclosed as Plate No.I to II . The joint verification reports of the non-forest land duly authenticated by Forest and Revenue authorities are enclosed as **Annexure-B Series**. Key Plans of CA area shown on topo sheets are enclosed as **Annexure-C Series**. GPS co-ordinates of survey stations of Compensatory Afforestation area are furnished as **Annexure-D Series**.

2. Description of Area

- I. **Whether the site selected for Compensatory Afforestation is a land bank or not:** This identified non-forest area is under the control of Revenue Department and classified as 'Gramya Jungle'. It is not a land bank.
- II. **If the CA site is other than the land bank, reasons be given:** No land bank has been established yet for this purpose.
- III. **In case of non-forest area identified for CA, then what is the distance of CA site from the adjoining forest boundary:** Land selected for the CA is a Forest land classified as 'Gramya Jungle'.
- IV. **Soil type:** The soil type as found in both patch is shallow, excessively drained, gravelly loamy soil on moderately hill slopes with loamy surface, On the whole, the soil of the tract generally has a higher content of clay and the lime concretion is found mixed with the soil. The higher clay content of the soil makes it crack during summer and sticky during rains.
- V. **Topography :**
 - a) Hilly/Undulating/Plain: The Compensatory Afforestation sites are undulating but not much hilly.
 - b) Slope: Steep/Medium/Gentle: The sites selected for Compensatory Afforestation have medium to gentle slope.
- VI. **Whether the area is bearing any root stock of vegetation:** The sites selected for Compensatory Afforestation are either barren or with weed growth like *Lantana*, *Eupatorium*, *Woodfordia fruticosa*, *Combretum decandrum*. Root stock of any principal species like Sal is not available.

3. Plantation Model:

The species for each site shall be decided basing on the existing physical growth in adjoining area, characteristics of trees foliage pattern, growth rate, branching pattern, soil characteristics and condition of the strip like water logged areas etc. Evergreen trees of tree that retains foliage for long time should be preferred over deciduous trees. AR Plantation @ 1000 plants per ha cost norm is furnished as **Annexure-E**. Plantation scheme has been prepared incorporating planting of 18 months old seedlings along with cost of transportation as per the One time cost norm of Principal Chief Conservator of Forests & HoFF, Odisha communicated vide Office Order No. 1109/9F (Misc)-387 / 2021, Dtd. 08.11.2021. In this case pit size has been enhanced from 30 Cm³ to 45 Cm³ to accommodate bigger size 18 months old seedlings with (12"x10") poly bags properly inside the dugout pit.

4. Technical details: Technical details of Compensatory Afforestation Scheme are as follows:

a) General Details :

Survey & Demarcation of boundary: The identified area will be surveyed by DGPS and the area will be demarcated with RCC pillars of size 2.5 mtr x 30 cm x 30 cm. This work will be done by the User Agency at Project cost.

Fencing: To protect the plantation from grazing and other biotic interference, it will be provided with Bamboo twigs and thorns fence, the cost for which will be paid by the User Agency. The Bamboo twigs and thorns fencing will be done around the entire patch as per the cost norm provided by the PCCF, Odisha vide Guideline dt. 08.11.2021, the length of Bamboo twigs and thorns fence needed in this project is furnished below: -

| Sl. No | Village | Length of outer periphery of the site in KM | Length of common fence of adjoining project which need not be fenced | Total length of fence in KM |
|--------------|------------------------|---|--|-----------------------------|
| (1) | (2) | (3) | (4) | (5) |
| 1 | Sindurbahal Patch-I | 1.298 | 0.00 | 1.298 |
| 2 | Sindurbahal – Patch-II | 1.544 | 0.00 | 1.544 |
| Total | | 2.842 | | 2.842 |

Estimate for Bamboo twigs and thorns fence has been provided in **Annexure – (F)**

Planting and post-planting:

b) Core Block plantation shall be taken up with 1000 plants per hectares at spacing of 2.5 m x 2.5 m. Alignment and pit marking should be done carefully in slopes so that the horizontal distance between plants in a row remains 2.5 mtrs and not the distance measured along the slope. All post planting measures like casualty replacement, soil working, manuring, fire protection etc. will be undertaken. The plantation area should be divided into 4-hectare plots. These plots should be demarcated in the field before digging of pits so that the demarcating line does not cross a plantation row. The 4.0 ha plots should be shown on map. Cost norm for Block plantation @ 1000 plant / ha is furnished as **Annexure-E**.

c) While taking up plantation, the following vital points shall be taken up for consideration: -

- Care to be taken to raise healthy palatable seedlings of minimum 60 cm height. 10% extra seedlings are to be raised for replacement of casualty.
- Pitting shall invariably be done during November-February i.e., before onset of monsoon. If possible, the soil of upper portion and lower portion of pit should be placed separately in specific direction so that while planting the pits will be filled with top-soil first.
- Planting shall be done on the onset of monsoon to get full benefit of monsoon rain and planting should never be delayed.
- Basal dose of 50 grams of NPK and 5 grams of Chlorpyrifos dust per plant should be applied at the time of planting carefully by mixing with top-soil so that the roots of seedlings do not come in direct contact with fertilizer.
- In case of any mortality of planted seedlings, it should be replaced with good seedlings as soon as possible for better success rate.
- Complete weeding in proper time will be done. Strip weeding will not be permitted.
- Soil-working and application of 2nd dose fertilizer of 50 gms NPK per plant should be done in time.
- Since the area is provided with Bamboo Twig , watch & ward will be easier and the watchers may be engaged in weeding in problematic areas along with watch & ward.

d) Species: Although indigenous species are to be preferred in the plantation, considering adverse soil & moisture conditions we may go for hardy exotic species where required so that the plants are able to survive. For success of plantation in interior tribal areas, plantation of fruit and NTFP species plays a great role since economic species have a little value for local people. Considering the topography, soil and moisture availability of the plantation area, the following species will be planted:

| Sl No | Name of species | Common name | Remarks |
|-------|---------------------------------|-------------------|--|
| 1 | <i>Azadirachta indica</i> | Neem | |
| 2 | <i>Derris indica</i> | Karanja | |
| 3 | <i>Emblica officinalis</i> | Amla | |
| 4 | <i>Terminalia chebula</i> | Harida | In lower areas with good soil depth |
| 5 | <i>Terminalia bellirica</i> | Bahada | In lower areas with good soil depth |
| 6 | <i>Dalbergia sissoo</i> | Sissoo | In lower areas with good soil depth |
| 7 | <i>Gmelina arborea</i> | Gambhari | In lower areas with good soil depth |
| 8 | <i>Dendrocalamus strictus</i> | Salia bamboo | In lower areas with good soil depth healthy seedlings from rhizomes may be planted |
| 9 | <i>Cassia siamea</i> | Chakunda | In lower areas with good soil depth |
| 10 | <i>Tamarindus indica</i> | Tentuli | In lower areas with good soil depth |
| 11 | <i>Madhuca indica</i> | Mahul | Only two years old seedlings may be planted |
| 12 | <i>Simarubaglauca</i> | Simaruba | In rocky areas with low soil depth |
| 13 | <i>Zizyphus Mauritania</i> | Ber | In rocky areas with low soil depth |
| 14 | <i>Tectona grandis</i> | Teak | Potted seedlings from pre-sprouted healthy stumps will be planted |
| 15 | <i>Mangifera indica</i> | Mango | In situ plantation (direct placing of mango stone in planting site) during pre-monsoon may be adopted in few lower areas or where watering can be done during summer |
| 16 | <i>Caryota urens</i> | Salapa | |
| 17 | <i>Terminalia arjuna</i> | Arjuna | Planted only on nala bank or near water. |
| 18 | <i>Desmodium mojeensis</i> | Bandhan | |
| 19 | <i>Dillenia indica</i> | Ou | To be planted in area having good soil depth |
| 20 | <i>Feronia limonia</i> | Kaitha | |
| 21 | <i>Ficus benghalensis</i> | Bara | |
| 22 | <i>Ficus racemosa</i> | Dimiri, Dumer | |
| 23 | <i>Ficus religiosa</i> | Aswattha | |
| 24 | <i>Acacia auriculiformis</i> | | |
| 25 | <i>Phoenix sylvestris</i> | Khajuri | |
| 26 | <i>Pithecolobium dulce</i> | Simakayan | |
| 27 | <i>Acacia catechu</i> | Khair | |
| 28 | <i>Acacia nilotica</i> | Babul | |
| 29 | <i>Artocarpus heterophyllus</i> | Jack fruit | |
| 30 | <i>Bauhinia variegata</i> | Kuler | |
| 31 | <i>Boswellia serrata</i> | Salai | |
| 32 | <i>Bridelia retusa</i> | Kasi | |
| 33 | <i>Buchanania lanzan</i> | Char | |
| 34 | <i>Calophyllum inophyllum</i> | Polanga | |
| 35 | <i>Cassia fistula</i> | Sunari | |
| 36 | <i>Ceiba pentandra</i> | White silk cotton | |
| 37 | <i>Chloroxylon swietenia</i> | Bheru | |
| 38 | <i>Cleistanthus collinus</i> | Karada | |
| 39 | <i>Albizia lebbek</i> | Siris | |
| 40 | <i>Albizia procera</i> | White Siris | |

d) Soil and Moisture Conservation Works: -

Since most of the area is undulating and slightly hilly various SMC measures should be constructed as provided in the cost norm. Estimate for various SMC measures like staggered trenches and loose boulder check dam.... etc. has been provided in the **Annexure-(F)**. The details of plantation and SMC measures proposed are given as under:

| Sl. No. | Area in Ha | Plantation model | Cost of Plantation in Rs. per Ha. | Total Plantation cost in Rs. | Cost of SMC Measures in Rs. per Ha. | Total cost SMC measures in Rs. |
|---------|------------|------------------------------------|-----------------------------------|------------------------------|-------------------------------------|--------------------------------|
| 1 | 13.876 | Block Plantation @ 1000 Plant / ha | 246454.00 | 3419795.70 | 37415 | 519170.54 |
| Total | | | | 3419795.00 | | 1038341.00 |

So, the cost of SMC measures amounting Rs. 519170.54 is 15.18 % of the total plantation cost of Rs. 3419795.70

e) Protection of the plantation: Bamboo twigs and thorns fence will be provided all along the periphery of the plantation. Few watchers will also be engaged for protection of the plantation. The cost norm of the Bamboo twigs and thorns fence is furnished as **Annexure-(G)**.

f) Watering: - In order to make the plantation sustainable and permanent assets against the harsh climate of the Bolangir which confront with continuous dry spell and mercurial level as high as 45 to 48 Degree during Peak May, it is badly essential for making a watering provision to the plantation. Keeping the above in view a watering provision of the Model-W-III prescribed by the Principal Chief Conservator of Forests & HoFF, Odisha has been proposed in the scheme. The detail of Cost Norm is furnished in **Annexure-H**

5. Proposed Monitoring Mechanism: The scheme shall be executed by the Divisional Forest Officer, Bolangir Forest Division with his staff and all prescribed records are to be maintained. In addition to internal monitoring by Forest Officers of State Government, a Monitoring Committee under item no. 3.4(iii) of consolidated guidelines under F.C Act 1980 issued by MoEF, shall be established with a nominee of the Central Government to oversee that the stipulations, including those pertaining to Compensatory Afforestation are carried out.

Total cost of the project: The total cost of the project is **Rs 1,22,70,852.00 (Rupees One Crore Twenty-Two Lakhs Seventy Thousand Eight Hundred Fifty-Two) only.** as detailed in **Annexure-I** which shall be payable by the user agency to the State CAMPA Accounts through online.


Divisional Forests Officer,
Bolangir Forest Division