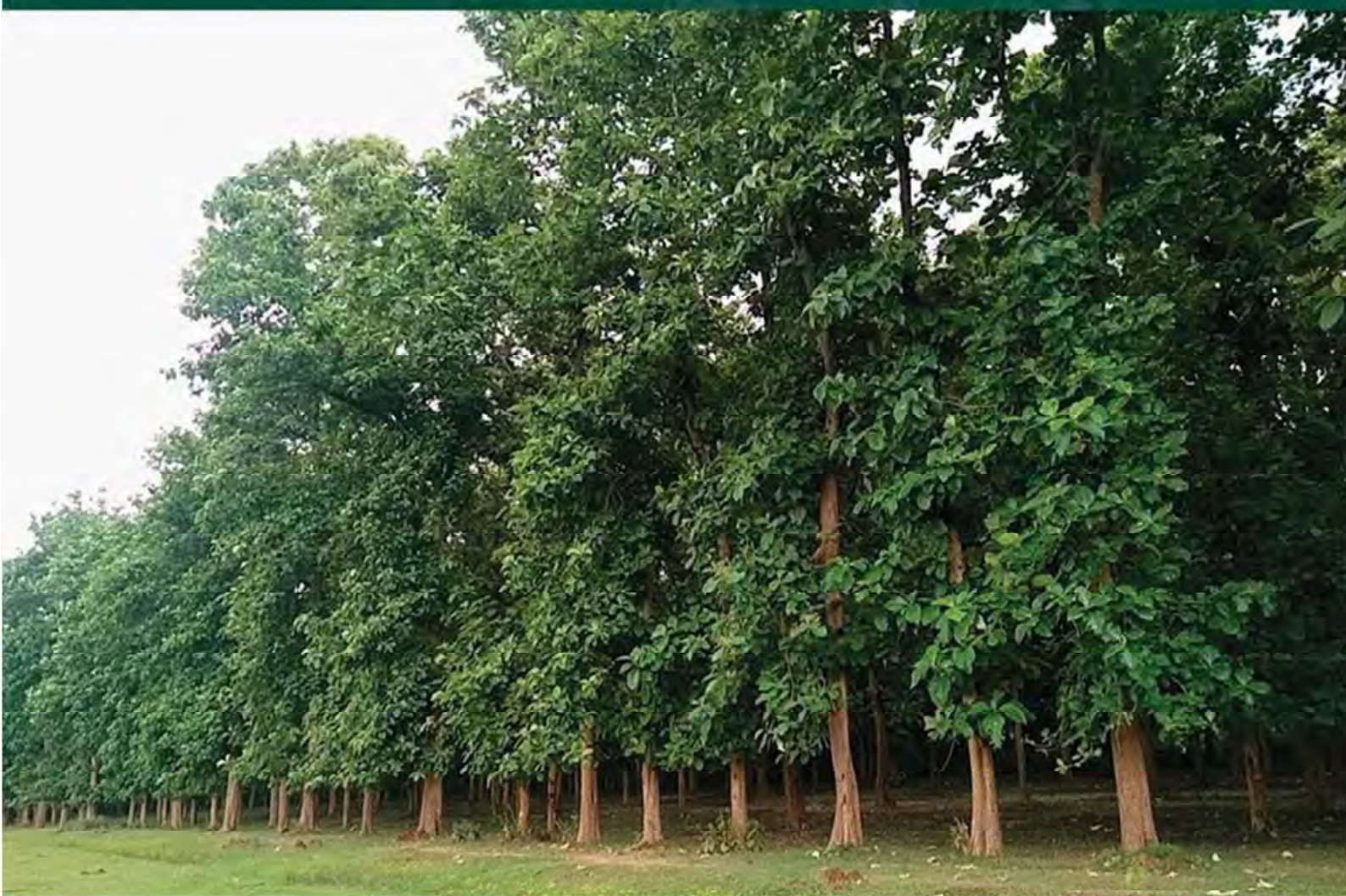


# **Evaluation of Projects Undertaken Under Compensatory Afforestation Fund Management and Planning Authority (CAMPA) in the State of Odisha**

**(APO Year 2009-10 to 2016-17)**



**Submitted to:**

Principal Chief Conservator of Forest & HoFF  
Aranya Bhawan, Bhubaneswar-23

**Submitted by:**

CTRAN Consulting Ltd.  
A1/A2, 3rd Floor, Lewis Plaza, Lewis Road  
BJB Nagar, Bhubaneswar-14





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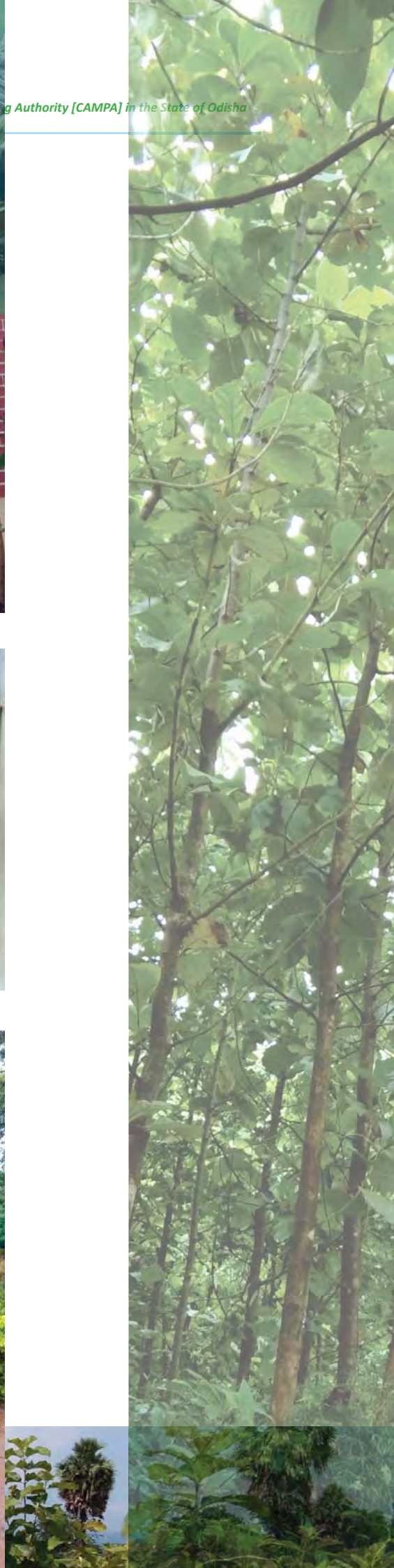
**CTRAN Consulting Ltd.**

A1/A2, 3rd Floor, Lewis Plaza, Lewis Road  
BJB Nagar, Bhubaneswar-14  
[www.ctranconsulting.com](http://www.ctranconsulting.com)





g Authority [CAMPA] in the State of Odisha





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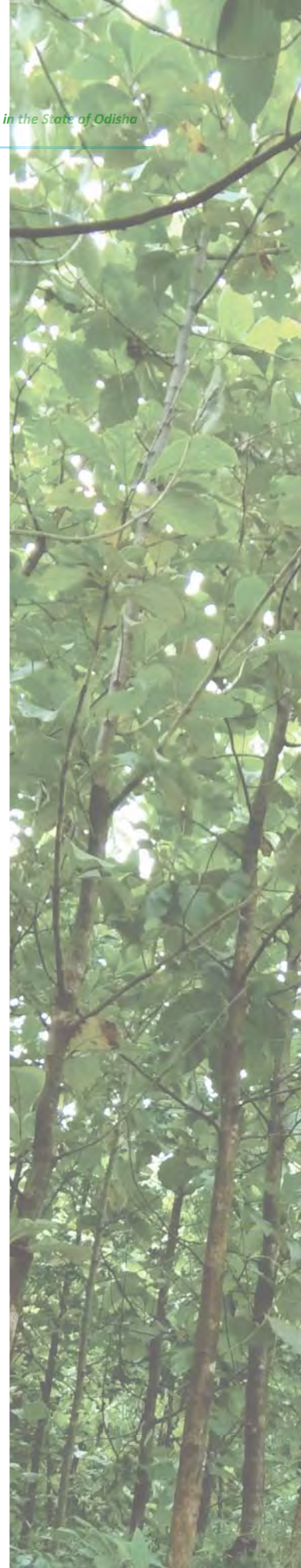




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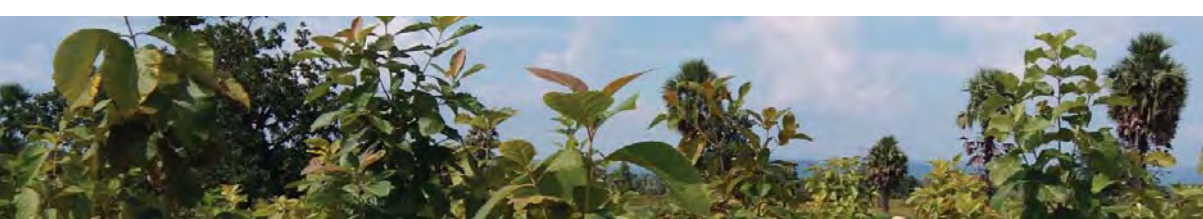
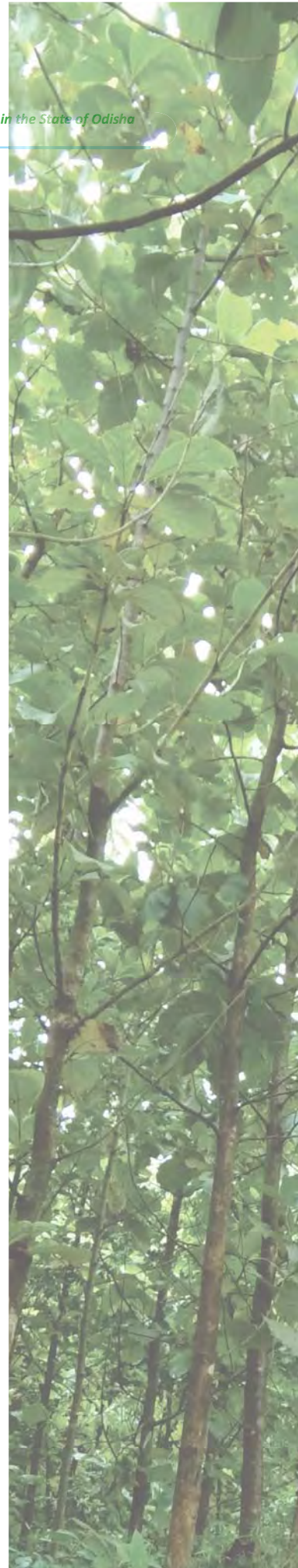




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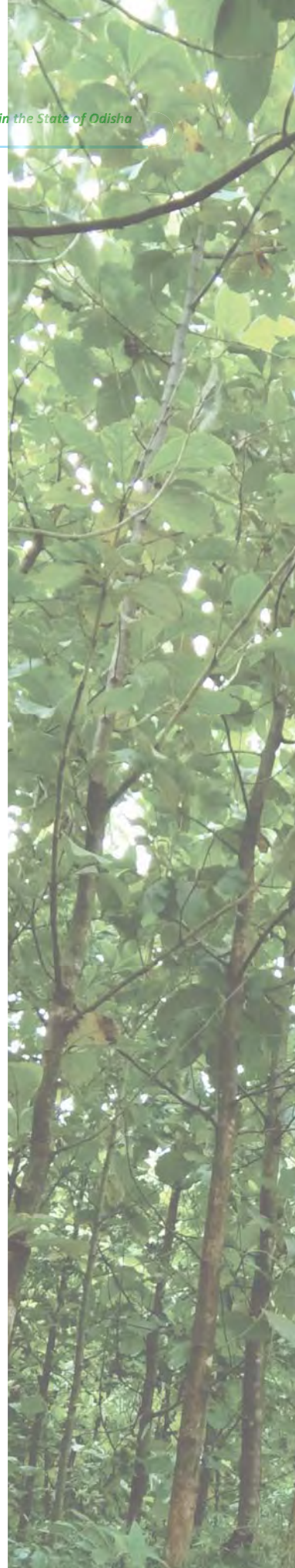




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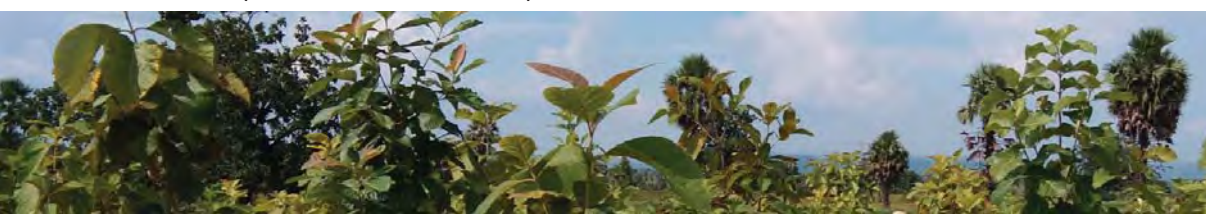




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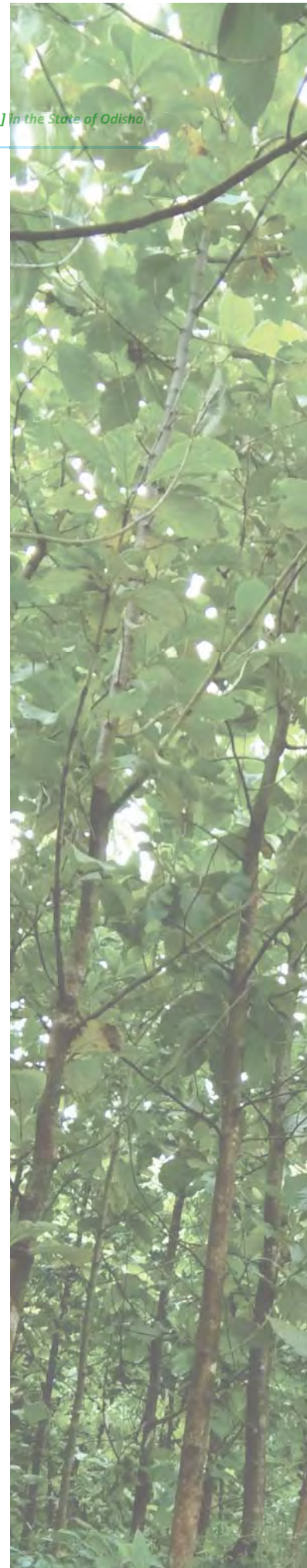




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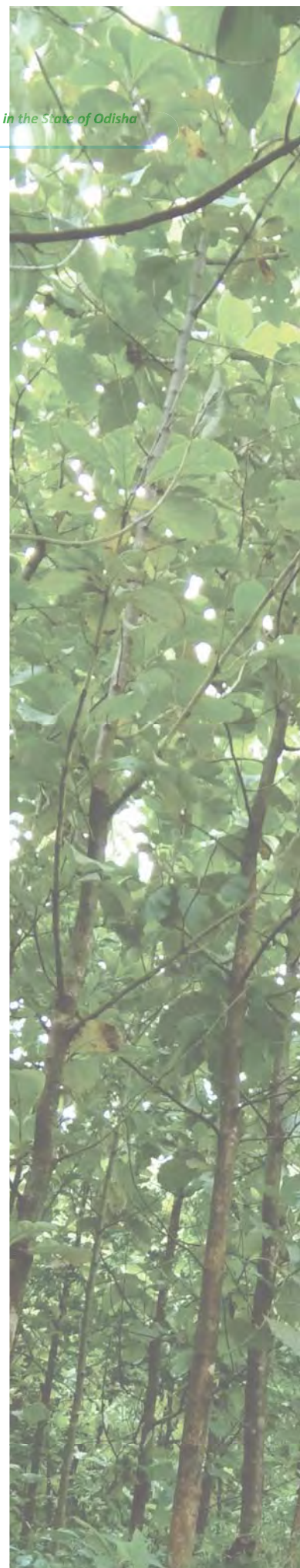




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## LIST OF ABBREVIATIONS

ACA	:	Additional Compensatory Afforestation
AJY	:	Ama Jangal Yojana
ANR	:	Assisted Natural Regeneration
APO	:	Annual Plans of Operation
AR	:	Artificial Regeneration
CA	:	Compensatory Afforestation
CAF	:	Compensatory Afforestation Fund
CAG	:	Comptroller and Auditor General
CAMPA	:	Compensatory Afforestation Management Planning Authority
CCF	:	Chief Conservator of Forest
CF	:	Conservator of Forest
CRM	:	Conservation, Regeneration and Management of Natural Forest
DBH	:	Diameter at Breast Height
DEO	:	Data Entry Operator
DFO	:	Divisional Forest Officer
DGPS	:	Differential Global Positioning System
EPA	:	Entry Point Activity
FG	:	Forest Guard
FGD	:	Focused Group Discussion
FSI	:	Forest Survey of India
Ft	:	Feet
GBH	:	Girth at Breast Height
GCH	:	Girth at Collar Height
GoO	:	Government of Odisha
GPS	:	Global Positioning System
Ha	:	Hectare
HQ	:	Head Quarter
Hd.Qrs	:	Head Quarters
ISFR	:	India State of Forest Report
IT	:	Information Technology
JFMC	:	Joint Forest Management
KII	:	Key Informant Interview
KM	:	Kilometres
LBCD	:	Loose Bold Check Dams
MGNREGA	:	Mahatma Gandhi National Rural Employment Guarantee Act
NAC	:	National Advisory Council
NFL	:	Non-Forest land
NFM	:	Natural Forest Management
NPV	:	Net Present Value
NRLM	:	National rural Livelihood Mission
NTFP	:	Non-Timber Forest Produce
PAS	:	Protected Areas
PCCF	:	Principal Chief Conservator of Forest
PEA	:	Preliminary Economic Analysis







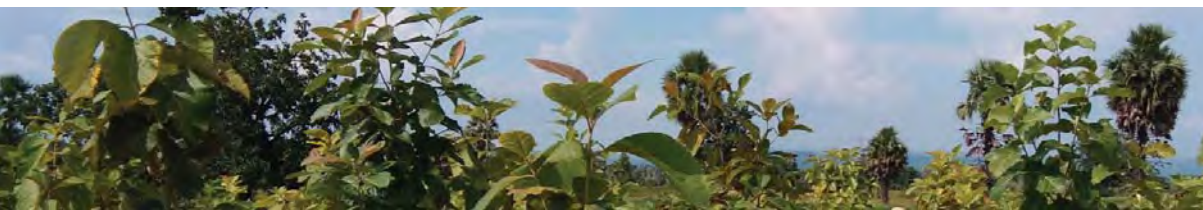
PMU	:	Project Management Unit
RDF	:	Regeneration of Degraded Forest
RFP	:	Request for Proposal
SMC	:	Soil and Moisture Conservation
VHF	:	Very High Frequency
VSS	:	Vana Samrakhshana Samiti
WHS	:	Water Harvesting Structures
WLM	:	Wildlife Management
WPO	:	Working Plan Officer





## SCIENTIFIC NAME OF THE TREES FOUND IN THE STUDY

Sl. No	Local Name	Scientific Name
1	Teak	Tectona grandis
2	Mangium	Acacia mangium
3	Sisoo	Dalbergia sisoo
4	Eucalyptus	Eucalyptus
5	Chatian	Alstonia scholaris
6	Bada chakunda	Samanea saman
7	Sana chakunda	Senna siamea
8	Mahagony	Swietenia macrophylla
9	Acacia auriculoformis	Acacia auriculoformis
10	Simaruba	Simaruba glauca
11	Maha neem	Melia azadirachta
12	Neem	Azadirachta indica
13	Bela	Aegle marmelos
14	Khaira	Acacia catechu
15	Radhachuda	Peltophorum pterocarpum
16	Karanja	Pongamia pinnata
17	Mango	Mangifera indica
18	Sal	Shorea robusta
19	Tarmarind	Tamarindus indica
20	Amla	Phyllanthus emblica
21	Asana	Pterocarpus marsupium
22	Bixa Orilina	Bixa Orilina
23	Gambhari	Gmelina arborea
24	Jammu	Syzygium cumini
25	Sirisa	Albezia lebbeck
26	White sirisa	Albezia procera
27	Bara	Ficus benghalensis
28	Bahada	Terminalia bellirica
29	Peepal	Ficus religiosa
30	Harida	Terminalia chebula
31	Krushna chuda	Delonix regia
32	Phasi	Anogeissus acuminata
33	Bara Koli	Ziziphus mauritiana
34	Simili	Bombax ceiba
35	Silver oak	Grevillea robusta





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Evaluation Team; CAMPAs  
CTRAN Consulting Ltd.









## EXECUTIVE SUMMARY









With the objective of conserving and protecting forest resources, Forest (Conservation) Act was enforced in the year 1980. On the top of such large scale continuous depletion of forest coverage in the country, the Forest (Conservation) Act 1980, mandated that whenever forest land is diverted for non- forestry purpose usually the conditions relating to transfer, mutation and declaration as Reserve Forest/Protected Forest, the equivalent non forest land for compensatory afforestation and funds for raising compensatory afforestation etc. are imposed. For mining purposes additional conditions like maintaining a safety zone area, fencing and regeneration etc. and for major and medium irrigation projects, catchment area treatment plans are stipulated. Further, the Act provided that the non-forest land for Compensatory Afforestation (CA) was to be identified contiguous to or in the proximity of Reserved Forest or Protected Forest.

The funds for CA were recovered from the user agencies on the basis of the rates fixed by the State Forest Department which were site specific and varied according to the species, type of forest and site. The money received for Compensatory Afforestation, Additional Compensatory Afforestation etc. was to be used as per site specific schemes submitted by the State along with the approved proposals for diversion of forest land. After receipt of the money, State Forest Department was to accomplish the afforestation for which money is deposited in the Compensatory Afforestation Fund within a period of one year or two growing seasons.

As per e-Greenwatch data available, forest diversion for non-forest purposes for all forest categories is to the extent of 130242 hectares by the end of December 2019. Of the total forest area diverted, RF, Revenue Forests, PFs and proposed PFs stand at 32.5, 25.7, 2.8 and 39.0 percent respectively.

The Compensatory Afforestation Fund Management and Planning Authority (CAMPA) Odisha was constituted vide Notification No. 13995/F&E dated 14.08.2009 with an objective of Conservation, Protection, Regeneration and Management of existing natural forests, Wildlife and their habitat and raising Site Specific compensatory Afforestation, Penal compensatory Afforestation etc. As per the provisions of CAMPA guidelines, the state CAMPA has been formulating Annual Plans of Operation (APO) for all the years since 2009-10. Since 2009-10 and up-to 2016-17, an amount of Rs. 182215.00 is released by Govt. of India to Odisha state for implementation of CAMPA. Odisha's share in overall CAMPA allocation stand more than





26 percent in all the years. considering all the years Odisha has received around 31 percent of the overall allocation of funds released from the Centre for implementing CAMPA activities.

## The Assignment

As a range of activities under CAMPA were taken up in Odisha; a technical evaluation of all the ongoing activities under CAMPA by a third-party evaluator was considered essential, for which CTRAN consulting Ltd was appointed to carry out third party monitoring of all the CAMPA interventions since 2009-10 (letter no- 19480/10F (CAMPA)- 07/11 (Part), dated 20th September, 2018, Bhubaneswar). The broad scope of evaluation comprises of all the components and sub-components of CAMPA implementation in Odisha.

## Study Area

The evaluation study covered 56 forest divisions of Odisha (37 territorial, 13 wildlife divisions and 6 R&D divisions) under 8 forest circles. In addition to it, Nandankanan zoo, Research and Training establishments where CAMPA funds are utilized are also covered in the study.

## Study Approach and Methodology

Various CAMPA intervention were evaluated using multiple data analysis approach and sampling criteria, in view of diversity, nature of component and stakeholders involved. The details of study approach and Methodology is provided in Chapter-1 of this report.

## Details of Data Collection

- **Primary Data:** By using separately designed formats for different components and subcomponents, first-hand information was obtained in relation to core and non-core activities. All the data collection formats are furnished in Annexure.
- **Secondary Data:** Secondary data relating to various activities undertaken in CAMPA were collected from the PCCF, Divisional offices and range offices, with the aid of pre- designed format and check lists.
- **Focus Group Discussion:** FGDs with the members of the Ama Jungle Yojana committee members were conducted in order to evaluate people's perception and participation level in implementation of CAMPA activities in a given locality.
- **Key Informant Interview (KII) and Consultation with Forest Officials:** KII and consultation was undertaken with a range of forest officers involved at various stages- planning and decision making, implementation, monitoring and evaluation. This included Chief Conservator of Forest (CCF), Conservator of Forest (CF), Divisional Forest Officer (DFO), Ranger Officers (Rangers), Foresters, Forest Guards etc.
- **Field Observation:** The study while visiting different plantation and other sites conducted field measurement also prepared notes on various activities under CAMPA implementation, which provides strong basis for the entire evaluation process.

## Performance of CAMPA during the period 2009-10 to 2016-17

- Till date, the state CAMPA, Odisha has formulated 8 annual plans of operation and the total funds received





from the Adhoc CAMPAs up to APO year 2016-17 stands at Rs. 1869.15 crores and the expenditure ending November, 2017 stands at Rs. 1580.97 crores which is 84.85% of the funds received.

- The core activities from CAMPAs fund comprises Plantation, creation of SMC measures, Forest Protection, Wildlife Management, Ama Jungle Yojana and Sacred Groves.
- Similarly, the non-core activities by utilizing CAMPAs funds comprise of Research Development and Capacity Building; Infrastructure Development; Forest IT and Working Plan Exercise; Monitoring, Evaluation and Accounting.
- During the period 2009-10 to 2017-18, about 98 percent of block plantation have been done during initial two years.
- After 2013-14, a rising trend of bald hill plantation is observed.
- Implementation of avenue plantation was focussed only in the initial year 2009-10. Subsequently, implementation of such plantation activity was discontinued in the CAMPAs APOs in all circles except Rourkela.
- During the initial years of CAMPAs APOs, compensatory afforestation was undertaken for two years only in all the circles and it was implemented during initial three years from 2009-10 to 2011-12.
- ANR plantation activities owing to its inherent merits of natural regeneration of trees have been accorded priority in CAMPAs APOs.
- Silvicultural operations were undertaken by all the forest circles during the initial years of CAMPAs implementation.
- Regeneration of bamboo is a focussed intervention in all CAMPAs APOs. Bamboo regeneration is not reported for Baripada circle under CAMPAs implementation.
- Management of old teak plantation of more than 10 years continued as a part of CAMPAs APOs upto the year 2013-14 and thereafter it got discontinued.
- Subsidiary silvicultural operations for timber under CAMPAs intervention, were undertaken for two years 2013-14 and 2014-15 in all circles except Bhubaneswar circle.
- Uprooting of invasive weeds were done in the year 2009-10 in all the forest circles. After 2009-10, it has not been reported in any of the forest circles. The outcome of such operation has not been monitored.
- Management of economic species was implemented only for two years 2010-11 and 2011-12.
- Various SMC structures done in CAMPAs APOs included loose boulder check dams, contour trenches, gully plugging etc. SMC structures undertaken under CAMPAs are site specific and undertaken as per the site requirement by frontline forest officers.
- Augmentation of manpower by employing forest protection squads, local youths and strengthening of infrastructural activity like Forest protection barracks, and investing in fire safety equipment's like blowers etc has constituted added focus for forest protection under CAMPAs.
- By the end of 2016-17 about 500 sacred groves were already developed under CAMPAs. Due to such activities, the neighbourhood community were found more proactive with the conservation activities undertaken by forest department officials.
- In order to protect the wild life and wild life habitat, CAMPAs APOs have dedicated provisions for wild life management. A range of activities comprising of deployment of wild life squads, river/sea squads, anti-depredation squads, elephant trackers, etc. are undertaken under CAMPAs. Wildlife protection and management received noticeable impetus during CAMPAs intervention





- Local VSSs are also supported under AJY. A majority of VSSs affirmed that due to CAMPA, conservation and protection of forest resources has improved and there has been increased livelihood opportunities for VSS members.
- Three types of training and capacity development programmes undertaken under CAMPA includes Theme based Training, strengthening communication and plantation skill development.
- A range of infrastructural activities were envisioned and implemented to replace and augment dilapidated structures. Range office buildings, Section office buildings, bit houses, Residential quarters for forest department officials, Forest Rangers' quarters are found to be major construction activities undertaken with the aid of CAMPA funds. Standard designs are followed for these construction activities and are done departmentally which is an economic and time saving approach.

## Key Findings

### Angul Circle

- In the Block plantation the plant survival rate varies from 90.4 percent (Athamallik FD) to 77.8 percent (Mahanadi WL). So, plant mortality rate varies between 9.6 percent (Athamallik FD) to 22.3 percent (Mahanadi WL).
- In the Bald Hill plantation, the survival rate of the plants under these categories found to be lowest in Cuttack FD (88.4 percent) and highest in Angul FD (95.0 percent).
- In ANR with gap plantation Plant survival rate per ha. varies between 92.5 percent (Dhenkanal and Athamallik) to 85.6 percent (Satakosia WL).
- In Avenue Plantation Plant mortality rate observed to be 9.3 percent in Athamallik and 9.6 percent in Cuttack.
- In Bamboo Plantation, the plant mortality rate calculated to be 7.9 percent.
- Canopy cover in bamboo plantation is observed high among all the plantation categories (85.0 percent), followed by block plantation (49.0 percent) and ANR with gap plantation (42.0 percent). Among all the plantations, canopy covered observed low in case of avenue plantation (40.0 percent).
- Different SMC works observed implemented in plantation sites with emphasis on staggered trench and LBCD structures. Percolation pits have also been taken up in some sites.

### Baripada Circle

- In Block Plantation plant survival rate varies from 99.5 percent (Keonjhar WL) to 92.75 percent (Baripada). So, plant mortality rate varies between 0.5 percent (Keonjhar WL) to 7.25 percent (Baripada Forest Division).
- In Bald hill Plantation The survival rate of the plants under these categories found to be lowest in Baripada (98.13 percent) and highest in Keonjhar WL (99.0 percent).
- In the ANR with gap plantation Plant survival rate per ha. varies between 84.7 percent (Rairangpur) to 96.9 percent (Karanjia). Accordingly, plant mortality rate varies between 3.1 percent (Karanjia) to 15.3 percent (Rairangpur).





- In the Avenue plantation Plant mortality rate observed to be 7.0 percent in Balasore and 16.0 percent in Karanjia.
- Height and girth of the plants by forest divisions reflects that mean maximum height of the plants in plantation category is highest in Karanjia (6.63 mt.) followed by Balasore (5.92 mt.) and lowest in Baripada (3.85 mt.)

### Berhampur Circle

- Block plantation is reported in all the forest divisions except Baliguda forest division. Similarly, bald hills plantations are taken up only in Berhampur and Ghumsar (South) forest divisions.
- Out of seven forest divisions, compensatory afforestation is implemented only in three forest divisions- Berhampur, Ghumsar south and Paralakhemundi forest divisions.
- Except OWP plantation, net area as percentage to gross area is more than 95 percent for all plantation activities. In avenue plantation, on an average for about 4 kms length, 10000 saplings are planted.
- On average 1594.4 hectares of Gross Forest Area and 1550.5 hectares of net area per forest range is covered under CAMPA implementation. Compared to all forest divisions under Berhampur circle, maximum net forest area in Baliguda division is covered under ANR plantation.
- Taking into account all types of plantation sites, average area of the plantation sites is found to be the highest at Baliguda division and lowest at Ghumsar (North) division.
- Plantation journals are maintained by all the sample ranges under all forest divisions for undertaking new plantation activities. However, for ANR type of plantation activities and subsidiary silvicultural operations, plantation journal is not maintained. Instead plantation registers are maintained for such activities.
- Plantation maps are prepared for all types of plantations at Baliguda, Berhampur and Boudh divisions. Ghumsar (south) division maintains it for all plantation activities, except SSO bamboo.
- In the sampled sites, there are about 232 clumps per hectare of forest area. Our survey reveals that 37 clumps are damaged per hectare of forest land. The extent of damaged clumps is found more at Berhampur and Paralakhemundi divisions compared to other divisions. With the support of silvicultural operations, 1st year culms, 2nd year culms and more than 2 years culms etc. were evaluated. Overall, the number of 1st year culms, 2nd year culms and more than 2 years' culms per hectare were found at 1784, 4011 and 3279 respectively.
- CAMPA fund enabled the department to engage contractual watch and ward staff in forest operation, management and wild life protection. Plantation casualty largely depended upon the watch and ward which benefited with continuity of the contractual employee who were mostly drawn from local community.
- Except for planation activities being carried under Ama Jungle Yojana (AJY), micro plans are not prepared for CAMPA led plantation activities.
- Similarly, during AJY FGD, the members of Nuapadar VSS stated that there has been improvement in forest cover after CAMPA implementation and tree species like Sal, Pedia Sal, Bahada, Mahula, Sahaja and Ghambarietc. They have also mentioned that there is no record of forests fire incidents owing to abandonment of podu cultivation in their area. They acquire Kendu leaves, Mahula, Mango, Bhalia and Jackfruit from the forests and these are adding value in their daily wages.
- Unlike OFSDP, under CAMPA implementation, entry point activities are neither a priority nor planned and implemented in a sustainable way.



- Treatment maps are prepared by all the divisions only for ANR type of activities, to delineate forest patches taken up for site improvement and stock enrichment.
- In Berhampur circle, of the planted species, teak, acacia, chakundi and karanja have better survival rate in the dry deciduous type of forests.
- The mean height and GBH of Plantations varied across sites even of same age influenced by the variability of soil and micro climatic condition and due to absence of seed selection.
- Out of seven forest divisions, regeneration of timber is undertaken in four forest divisions, silvicultural operations are undertaken in three forest division. OWP revenue is done only in Paralakhemundi division. Conservation of old teaks plantations and economic species are done in Berhampur and Ghumsur South forest divisions. Except Baliguda division, regeneration of bamboo forests is undertaken in all of the forest divisions.
- The pillar posted to define treatment area and forest blocks were found damaged and not been maintained in desired manner.
- The SMC work carried out at all sites have resulted in checking soil erosion, and helped in adding good soil cover
- On average, 494 kms of Fireline is prepared per forest range.
- In few ranges, local VSSs were involved for forest protection. There are about 64 para staff per range employed for forest protection.
- CAMPA fund helped in intensification of protection measures and wild life management across divisions. For the evaluation period 7 poaching cases registered per range. On an average 21 wildlife's were rescued and rehabilitated and 11 poachers involved in wildlife offence were booked
- Incidence of human animal conflict is found higher at Boudh division followed by Ghumsur north division.

### **Bhawanipatna Circle**

- Out of the total plantation sites, majority of plantation activities are created in the year 2015-16 followed by 2016-17 and 2014-15.
- The average area under plantation is calculated at 22.2 hectares. Compared to the overall average area of plantation, the average area under block plantations is found higher.
- There are about 33 varieties of different species witnessed in all types of plantations evaluated. Intensity of teak is found to be the maximum and there are about 5303 teak trees for every 10000-tress planted under CAMPA.
- On the basis of casualties, the performance of AJY plantation, bald hills plantation is found 'high'; the performance of block plantation and OWP plantation is found 'medium' and the performance of avenue plantation is 'low'.
- The survival, and growth of plantations on the basis of selected parameter is found to be satisfactory.
- The average area per ANR with gap plantation site is 88.2 hectares. Plantation under ANR with gap plantation was undertaken in relatively bigger patches with block plantation mode of spacing between trees.
- Overall height and GBH performance in ANR with gap plantations across forest divisions in Kalahandi circle are found at 0.4 metre and 1.4 cms respectively.





- The performance of SSO activities for bamboo forest can be labelled as 'medium'. On an average, 66 clumps per hectare of forest area was recorded. The number of first year culms, second year culms and more than two years culms per hectare of forest area are found at 330, 396 and 594 respectively.
- SMC works are created on about 92.3 percent of plantation sites.
- Overall, about 77.9 percent of the plantation sites are found with staggered trenches. Percolation pits are found only in ANR with gap plantation of Kalhandi South forest division. Stone packing are found with SSO bamboo operations.
- 46 percent silt deposit was recorded for different SMC structures.
- Water bodies created under CAMPA benefited immediate neighbourhood community in addition to the benefits to wild animals.
- About 90 percent of the sample plantation activities comprises of AR plantation activities for which plantation journals are maintained.
- However, only 66.3 percent of plantain sites maintained it fully. Remaining 23.1 percent maintained it partially and about 10.6 percent hadn't maintained it.
- Plantation maps are maintained by 86.5 percent of the sites. Micro Plans are prepared under plantation programmes carried out under "Ama Jungle Yojana" only.
- Treatment maps are prepared for AR plantation activities. Although, there is provision of preparation of treatment maps for all ANR with gap plantations, it is only found in Sonapur division only.
- Three out of four VSSs reported their respective involvements at various stages of plantation development. All the VSSs adhere to project implementation plans. All the VSSs do maintain good relationship and cooperation with the department.
- Due to CAMPA support, survival and growth of plantation have improved in all the VSS areas, and frequency of forest fire incidences is rarely witnessed, there is no Podu cultivation which was practiced by the villagers previously.
- Frequency of human animal conflict is rarely reported.
- The construction quality of all type of buildings are observed to be of good quality and on the basis of usability and impacts, all the infrastructure facilities are found relevant and effective.
- Meganursery Infrastructure like seedling yard, compost pit, mixing yard, store house, seedling beds etc. have raised the departmental capacity to produce quality planting material.

### Bhubaneswar Circle

- Out of 31 plantation sites covered in the study, 64 sample plots covered different plantation categories in all forest divisions. Maximum number of plantation sites are covered in Nayagarh WL followed by Khordha forest divisions.
- There are six type of AR plantation activities reportedly taken up under CAMPA intervention during the period 2009-2017 in Bhubaneswar circles
- The average length of avenue plantation is 5.7 kms found in City forest, Khordha and Puri divisions. The average area of Mangrove plantation is 100 hectares which is only found in Rajnagar W/L division. Compensatory Afforestation and Penal Compensatory Afforestation (CA-PCA) exclusively of mangroves is done in Rajnagar W/L division. However, CA-PCA of other plantation activities is taken up in City forest and Khordha forest divisions.
- Considering all plantation sites average area of plantation is 48.6 hectares. The average area for block plantation, bald-hills plantation, CA-PCA (Mangrove), CA-PCA (mixed) is found at 49.3, 20.0, 88.0, and 7.1 hectares respectively.



- About 21.9 percent of plantations were created in the initial year of CAMPA i.e.2009-10. Maximum proportion of plantation sites were created in the year 2014-15 followed by 2015-16.
- On the basis of survival performance, the status of AR plantation is ranked as high, medium and high.
- Following the plant survival ranking criteria, performance of Chandaka W/L is high, for Chilika W/L and Nayagarh, it is medium and for Puri W/L division it is low.
- CA- PCA mangrove plantation is carried out only in Rajnagar W/L division. It is reported by the forest officials that mangrove plantation is done with 1.5 metres spacing and there is no casualty in such plantation. Due to 100 percent plant survival in such plantation, the performance of CA- PCA (mangrove) type of plantation is found high.
- Badachakunda, Phasi and Jamun are three major species under avenue plantation; Akasia, Mangium and phasi are found to be the major species under bald hill plantations, Akasia, Casurina and Bada Chakunda are the major species under Block Plantation. Teak and Mangium species are found to be the major species under CA-PCA plantation.
- The plantation was badly affected during cyclone Phani.
- The SMC performance of all such plantations is fixed low. On the other hand, on the basis of performance ranking scale which is expressed in terms of average siltation percentage, the overall performance of SMC activity considering all plantation types and all forest divisions is found high. Performance of SMC works in mangrove plantation is kept 100 percent because the basic objective behind such plantation is soil conservation in nature.
- Mainly staggered trenches, half-moon trenches and stone packing around trees are mainly found at plantation sites. Staggered trenches are found at 26.6 percent of the plantation sites and half-moon trenches with stone packing are found only in SSO bamboo sites.
- Overall tree survival and causality in ANR Plantation is found at 86.9 and 13.1 percent respectively. Compared to overall survival of trees under ANR with gap plantation, it is found higher in Nayagarh and Chilika divisions and lower in Khordha divisions.
- The overall canopy percent for ANR with gap plantations is found at 35 percent.
- CRM activity broadly covers SSO works, ANR without gap and conservation of old plantations and forest patches. SSO bamboo and SSO timber are the prominent CRM activities found in Bhubaneswar circle. The average area under SSO bamboo and SSO timber is found at 308.3 and 508.0 hectares respectively.
- Analysing the performance of SSO Bamboo activities on the basis of sample data in Khordha and Nayagarh, it is found that overall, there are 125 clumps per hectare of forest area of which around 15.05 were damaged during the time of survey. On an average the number of first year, second year and third year culms are found at 560, 960 and 1265 respectively.

### Koraput Circle

- Key plantation activities that have been taken up in the circle are block plantation, ANR with enrichment planting, bald hill plantation, avenue plantation and CA PCA.
- Block plantation was taken up in 2009-10, covering a total of 2,662 ha. ANR with gap plantation covered a total area of 3,430 ha. in 2014-15 and 9,800 ha. in 2015-16. Avenue plantation in the year 2009-10 covered a total area of 2,662 ha. In bald hill plantation, 250 ha. covered in the year 2011-12, 197 ha. in 2012-13 and 180 ha. in 2015-16.





- Under silvicultural operations, activities such as SSO-Timber, SSO-Bamboo, ANR without Gap plantation, maintenance of old Teak plants and management of economic species.
- Overall, mortality rate is calculated to be 9.6 percent. Highest plant mortality is reported in Koraput forest division (19.1 percent) followed by Malkangiri (12.6 percent) and lowest in Rayagada forest division (4.9 percent).
- In block plantation, average no. of plants per ha. enumerated to be 1,474 with highest average number of plants in Nabarangpur (1596) and lowest in Malkangiri (1380).
- In bald hill plantation, average no. of plants per ha. enumerated to be 1,478 with highest average number of plants in Rayagada (1,555) and lowest in Koraput (1,410).
- Average number of plants per ha. enumerated to be 175 with highest number of plants per ha. in Jeypore (187) and lowest in Koraput (155).
- Different SMC works have been taken up based on its locational suitability and assessed requirements. Different SMC activities taken up in plantation sites are staggered trench, half-moon trench, LBCD, check dam structure etc.
- The mean maximum height of the plants, irrespective of the year of plantation and plant species, calculated to be 7.06 mt. The mean minimum height of the plants at the circle level found to be 3.86 mt. for the plantation sites. Similarly, mean maximum GBH has been 25.73 cm and mean minimum GBH has been 13.05 cm.
- Plant protection measures such as fencing, fire protection measures, watch and ward etc. In certain cases, villages and VSS have been found taking care of the local forest area and plantation sites.
- As per specification records / documents are maintained at the range office level with respect to plantation / silvicultural activities, such as plantation journal, plantation site map, treatment map and other registers.

#### Rourkela Circle

- Teak, acacia, karanja, simaruba, sanachakunda constitute to be the five major tree species undertaken under CAMPA aided plantation activities.
- The average area under AR plantation per site stands at 51.3 hectares which is higher in the case of bamboo plantation. Average area per site of safety zone plantation found stands lowest at 1.7 hectares.
- Overall casualty and survival in all plantation categories of the circle is found at 8.05 and 91.95 percent respectively.
- The survival percentage of bald hill plantation stands highest compared to all other AR plantation categories.
- The coverage of canopy in percentage terms indicates that overall canopy coverage in all AR plantation categories stands at 49.8 percent which is found higher in Bonei and Sundargarh divisions.
- The average area of ANR sites is 175.6 hectares. The average area for CA-ANR with gap plantation is about 300 hectares followed by ANR with gap plantation at 165.4 hectares, PCA- ANR with gap plantation at 89 hectares and ANR without gap -AJY at 51.3 hectares.
- Analysis of plant survival and casualty of ANR with gap plantation reveals that overall, there are 186 surviving trees per 200 trees planted.
- Overall height and GBH performance considering all ANR with gap plantations across forest divisions in Rourkela circle are found at 0.4 metre and 1.4 CMs respectively.



- On an average, considering SSO bamboo activities for all divisions, there are 92 surviving clumps and 7 damaged clumps are found per hectare of forest area. Altogether there are 99 clumps found per hectare forest area. The survival of clumps varies between 88 to 98 percent in all the sites visited.
- The total culms performance for Sundargarh division is found highest at 4004 culms per hectare of forest area.
- Canopy performance of old teak management plantation is found 'high' because in all of the site average canopy (%) is more than 70 percent.
- Majority of plantation sites have two types of SMC structures. Proportionately 16.2 percent of the sites have two SMC structures and 14.6 percent of the structures have more than two SMC structures on plantation sites.
- Half-moon trenches as well as stone packing are noticed in all of the bamboo plantation (SSO) sites. Staggered trenches are found in all ANR with gap plantation, bald-hill plantation, CA block plantation sites along with other types of SMC structures.
- Overall, it is found that there is 34.1 percent deposition of silts on SMC structures.
- 72.3 percent of the sites maintain plantation journals. Micro plans are maintained in 5.4 percent of the plantation sites undertaking plantations under AJY.
- Treatment Maps are maintained in 21.5 percent of the plantation sites. Majority of plantation sites to the extent of 78.5 percent are found to have installed pillars around plantation sites.
- Watch and word is a common protection measure followed at majority of plantation sites.
- Species like Babachakunda, Bheru, Kurai, Neem, Sidha, Kendu were observed as regenerated at the teak management site. Regeneration of Natural species like Rohini, Karda, Sal, Asana, Sidha, Bheru are observed in ANR with gap plantation.
- VSS has developed good rapport with department in the aftermath of CAMPA implementation.
- Due to CAMPA intervention, a number of infrastructure facilities were created in all forest ranges including range office, forester quarter-cum -office, forest guard quarters, barracks.
- The construction quality of buildings are observed to be quite high and the infrastructure created found to be productive
- All of the available facilities inside mega nursery were found to be well maintained.
- Solar fencing in many places are found defunct as a result of non-maintenance of solar-photovoltaic systems (SPS).

### Sambalpur Circle

- Of planting activities, 41.57 percent sites are ANR with gap, 5.62 percent are bamboo plantation, 43.82 percent are block plantation, 6.67 percent are CA-PCA and remaining 2.25 percent are corridor & fodder plantation sites.
- Among the silviculture operations, 8.57 percent are ANR without gap, 11.43 percent are ANR without gap in AJY, 5.71 percent are management of old teak sites, 65.71 percent are SSO-bamboo and 8.57 percent are SSO-timber.
- Plantation in the circle covers a total area of 22268 ha. in the last 5 years, i.e., on an average 2783.5 ha. per year,
- Key plantation modules taken up are ANR with enrichment planting, block plantation, CA PCA and Bamboo plantation.





- Under silvicultural operations, different activities taken up are like SSO-Timber, SSO-Bamboo, ANR without Gap and maintenance of old Teak plantations.
- The average plantation area of the studied sites observed to be 130.69 ha. with total plantation area of 11,631.48 ha. Of the total plantation area, 55.8 percent are ANR with gap plantation, followed by block plantation (29.7 percent) and bamboo plantation. CA-PCA and corridor-fodder plantation has been less, i.e., 1.3 percent and 0.3 percent of the total plantation.
- Overall, mortality rate across plantations is calculated to be 9.3 percent.
- ANR with gap plantation (enrichment planting) is taken in a dual mode, i.e., dense plantation in block mode in identified patch of land and/or sparse / scattered plantation in the forest area. In ANR with gap plantation, the plant mortality rate varies between 1.54 percent (Sambalpur) to 7.29 percent (Rairakhol).
- Compensatory afforestation observed in Bargarh, Jharsuguda and Rairakhol forest divisions of Sambalpur circle. Plant survival rate is highest in Rairakhol (98.44 percent) and lowest in Bargarh (94.38 percent).
- It is observed in the assessment that the canopy cover varies by plantation types and year of plantation.
- Pillars have been installed in different plantation sites, 30% of which are at various stages of decay.
- The mean maximum height of the plants, irrespective of the year of plantation and species, calculated to be 3.7 mt. and 16.1 mt. in case of plants covered under silvicultural operations.
- The mean minimum height of the plants found to be 1.9 mt. for the plantation sites and 13.5 mt. for the sites covered under silvicultural operations.
- Similarly, in case of plantation, mean maximum GBH has been 16.9 cm and mean minimum GBH has been 8.6 cm. Mean maximum and mean minimum GBH of plants under silvicultural operations found to be 138.1 cm and 114.6 cm respectively.
- Plant protection measures such as fencing, fire protection measures, watch and ward etc. were put in place. In few villages VSS have been found to be actively taking care of the assigned plantation sites.
- Different records / documents such as plantation journal, plantation site map, treatment map and other registers with respect to plantation activities. are maintained at the range office level
- Species found to be regenerated in the treated areas are i.e. Mai, Chara, Sal, Achu, Kendu, Sunari, Bahada, Rohini, Sidha, Ghurudu, Kasi, Sunari, Neem, Dhaura, Pahadi sissoo, Kekat, Kurei and Khaira.
- With respect to infrastructure development different types of buildings i.e. Range Office, Ranger's Residence, Forester office-cum-residence, Beat House, Staff Barrack, Anti-poaching shed, Check gate shed etc. are constructed under CAMPA funds. As well as some other assets like forest road, causeway, culvert, saltlick, water bodies, boundary wall, VHF tower, elephant trench, tube well, nursery, seizure yard, meadow development and sacred groves are also developed under CAMPA fund in Sambalpur Circle.



## Recommendations & Suggestions

- Watch & ward should be extended to 8 years instead of 4 years.
- Indigenous and diversified species for plantation under ANR should be adopted to replicate like a natural forest.
- During physical evaluation, it was observed that chances of illicit felling are higher in plantation sites nearer to human habitation due to consumption of fuel wood and other forest products. Accordingly, more emphasis should be given for watch & ward.
- In those lands where soil quality is not conducive for a particular species of plant, manure can be applied during initial years of plantation.
- In dense forest sites only protection in terms of watch & ward is not sufficient for proliferation of natural forest. Additional SMC works can be done to protect from soil erosion and moisture conservation.
- Fire protection measures such as fire line creation, training of fire squad & upgradation of equipment should be done every year. For effectiveness maintenance of fire lines should be done on routine basis.
- In sloppy terrain areas where siltation percentage is high, renovation of SMC works should be done.
- Unwanted species need to be uprooted for better growth of plantation.
- Good coppice tree species should be planted, so that in case of fire incidence or illicit tree cutting, new shoots come up and within few years lost biodiversity can be restored.
- Due to climate change, some areas are facing erratic rainfall and dry spells. Hence plant species which are adaptive to such scenarios should be planted instead of regular one.
- In elephant prone areas, fruit bearing corridor plantation can be done to prevent human elephant conflict. However, fruit bearing plants like mango, jack fruit etc required pruning and summer season maintenance.
- Inside treatment area of ANR where plantation activities are not done, some measures like fire protection, SMC creation and general watch & ward should be done to preserve the existing forest.
- In bamboo plantation, saplings picked for plantation should be minimum one year so that it can survive in natural forest.
- Silviculture evaluation should be done within one year of operation. So that output of silviculture operation can be accessed correctly.
- Maintenance work like pruning, thinning, climber cutting and removal of unwanted species should be done periodically at all plantation sites.
- Solar fencing is not working at some place. Hence immediate repairing solar fencing should be done.
- VHF and wireless station are not operative at majority of sample ranges visited.
- Boundary wall and Tube well should be provided in residence of Ranger, Forester and Forest guard.
- Due to water stagnation at roof, durability of building reduces. Hence staircase should be provided in buildings to access roof.







## CHAPTER - I







## 1. Introduction

### 1.1 Background

Forest in India comprises of a number of diverse forest types and reserved areas designated as National Parks and Wildlife Sanctuaries which accounts for about 23% of Geographical area of the country. Forest provides livelihood support to the people living in and adjoining forests. At all India level there are about 1,73,000 forest fringe villages and the inhabitants of those villages are immensely benefitted from multiple ecosystem services from forest. Forests are the biggest natural carbon sinks and regulates water regime. In view of these, forest sector provides number of goods and services to mankind. Article 48-A of the Constitution of India requires that the State shall endeavor to protect and improve the environment and to safeguard the forest and wildlife of the country. Under Article 51A, it is the duty of every citizen to protect and improve the natural environment including forests, lakes, rivers and wildlife for which the forest sector requires conservation and continuous protection. But, over years, the forest land diverted for facilitating developmental activities for non-forestry purposes like construction of power projects, irrigation projects, roads, railways, schools, hospitals, rural electrification, telecommunication, drinking water facilities and mining etc. Thereby leading to large scale shrinkage of forest coverage to the overall geographical area of the country.

### 1.2 Status of Forest Resources in Odisha

Based on interpretation of satellite data pertaining to Oct-Dec 2015, the forest cover in the state is 51,345 sq. km which is 32.98% of the state geographical area (Forest Survey of India, 2017). However, the recorded forest area is significantly higher than this, at 58,136 km<sup>2</sup>, which constitutes around 37.34 per cent of the geographical area of the state. In terms of forest canopy density classes, the state has 6967 sq. km under very dense forest, 21370 sq.

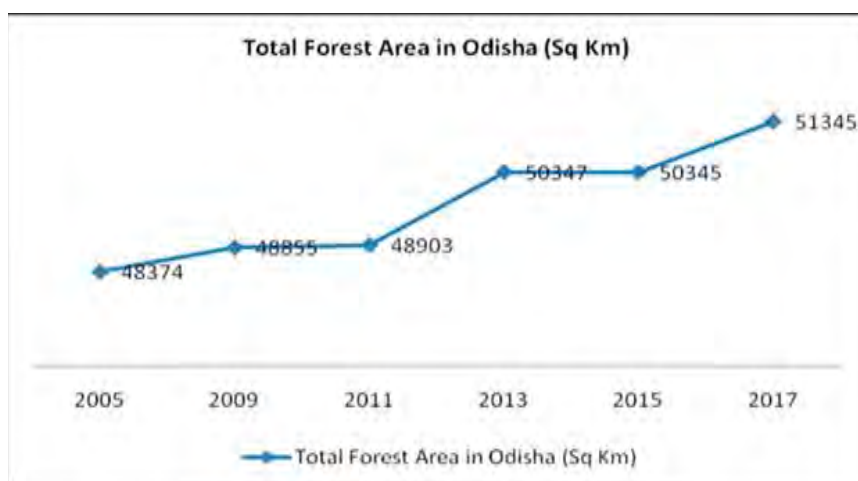
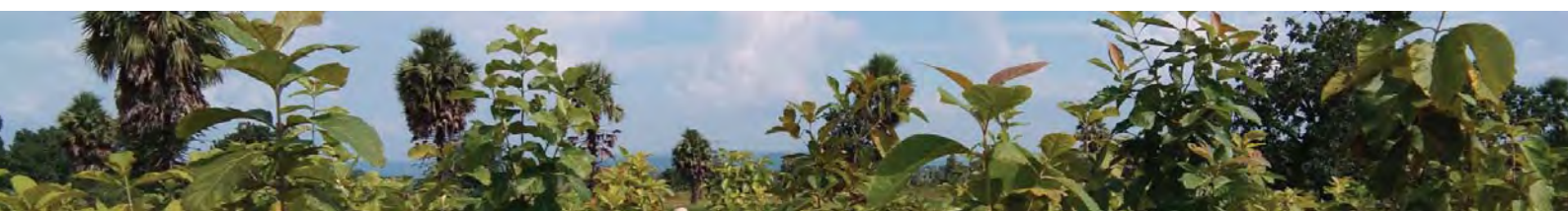


Figure 1:2 – Distribution of total forest area in Odisha (Sqkm)

km under moderately dense forest and 23008 sq. km under open forest. The total forest of the state decreased from 56661.1 sq. kms in 1975 to 48669.4 sq. kms in 2010 and correspondingly non-forest area comprising of scrub, grassland, wetland and others increased from 99045.9 sq. kms in 1975 to 107037.6 sq. kms in 2010. However, in subsequent years as it can be observed from the chart -1.2 the forest area has increased. Table 1.1 explains that forest land cover by type comprising of semi evergreen, moist deciduous, dry deciduous and mangrove forest types as a percentage to total forest area of the state has decreased from 36.4 percent in the year 1975 to 31.3 percent in the year 2010. Correspondingly, land cover in terms of scrubs, grasslands, wetlands and other land use pattern has increased overall from 63.6 percent to 68.7 percent.





**Table 1.1- Distribution of Forest types and other land cover in 1975 and 2010 (area in km<sup>2</sup>)**

Sl. No	Land cover type	1975		2010		Change (1975-2010)	
		Area	% of area	Area	% of area	Area	% of area
I	Forest						
1	Semi Evergreen	1520.2	1	1504.1	1	-16	-1.1
2	Moist Deciduous	39506.8	25.4	36482.5	23.4	-3024.2	-7.7
3	Dry Deciduous	15321.7	9.8	10376.9	6.7	-4944.8	-32.3
4	Mangrove	312.4	0.2	305.8	0.2	-6.6	-2.1
Sub total		56661.1	36.4	48669.4	31.3	-7992	-14.1
II	Non-Forest						
5	Scrub	9071.9	5.8	11248.3	7.2	2176.3	11.7
6	Grassland	404.9	0.3	696.6	0.4	291.7	72
7	Wetland	2932.2	1.9	3384	2.2	451.8	15.4
8	Other Land use	86636.8	55.6	91708.7	58.9	5071.8	7.1
Sub total		99045.9	63.6	107037.6	68.7	7991.7	8.1
Grand Total		155707	100	155707	100		

**Source:** Reddy, et al (2012)<sup>1</sup>

### 1.3 District-wise Forest Coverage in Odisha

The distribution of the overall forest area among 30 administrative districts of the state points out that the district Kandhamal is having the highest recorded forest area of 5371 sq. kms followed by Sundargarh (4148sq.kms.), Mayurbhanj (4021 sq. kms.), Samablpur (3358 sq. kms.), Keonjhar (3211 sq. kms.) and Rayagada (3133 sq. Kms). These six districts together account around 46.2 percent of forest area of the state. With respect to district forest area as a percentage to the total area of the state, Kandhamal district also stands highest and forest area as a percentage to the total geographical area of the district stands about 66.96 percent. There are three districts Kandhamal, Gajapati and Sambalpur where forest area as a percentage to their respective total geographical area is more than 50 percent. Similarly, there are another seven districts Deogarh, Rayagada, Nayagarh, Sundargarh, Angul, Boudh and Malkangiri, where forest area as percentage to their geographical area ranges between 40 to 50 percent. Less than 10 percent forest area as percentage to the respective geographical area of the district is found in four districts, Balasore, Jagatsinghpur, Puri and Bhadrak.

<sup>1</sup> Reddy C Sudhakar, Jha C S and Dadhawal V K (2012), "Assessment and monitoring of long-term forest cover changes in Odisha, India using remote sensing and GIS", National Remote Sensing Centre, ISRO, Balanagar, Hyderabad-500625,





Districts by Forest Area as % to the total Geographical Area of the State			
> 50% Kandhamal, Gajapati, Sambalpur	25-50% Ganjam, kalahandi, Dhenkanal, Nuapada, Mayurbhanj, Keonjhar, Angul, Malkangiri, Boudh, Sundargarh, Nayagarh, Rayagada, Deogarh,	10-25% Kendrapara, Jajpur, Sonepur, Balangir, Jharsida, Bargarh, Khurda, Cuttack, Nabarangpur, Koraput	<10 % Bhadrak, Puri, Jagatsinghpur, Balasore

Table 1.2: District wise Forest Coverage in Odisha (Area in Sq. Km.)

District	Geo-graphical Area	Very Dense Forest	Moderate Dense Forest	Open Forest	Total	Percent of GA	District Forest Area as a % to the total forest area of the state
Angul	6375	362	1350	990	2702	42.38	5.4
Balasore	3806	23	126	199	348	9.14	0.7
Bargarh	5837	176	371	396	943	16.16	1.9
Bhadrak	2505	0	7	55	62	2.48	0.1
Bolangir	6575	69	222	675	966	14.69	1.9
Boudh	3098	264	548	451	1263	40.77	2.5
Cuttack	3932	44	206	521	771	19.61	1.5
Deogarh	2940	156	623	596	1375	46.77	2.7
Dhenkanal	4452	172	346	881	1399	31.42	2.8
Gajapati	4325	84	1485	902	2471	57.13	4.9
Ganjam	8206	162	1089	849	2100	25.59	4.2
Jagatsinghpur	1668	0	6	127	133	7.97	0.3
Jajpur	2899	6	68	222	296	10.21	0.6
Jharsuguda	2081	3	138	170	311	14.94	0.6
Kalahandi	7920	419	777	1211	2407	30.39	4.8
Kendrapara	2644	82	81	106	269	10.17	0.5
Keonjhar	8303	303	1385	1523	3211	38.67	6.4
Khandamal	8021	650	2620	2101	5371	66.96	10.7
Khurda	2813	23	187	246	456	16.21	0.9
Koraput	8807	102	727	1099	1928	21.89	3.8
Malkangiri	5791	157	709	1455	2321	40.08	4.6
Mayurbhanj	10418	1326	1707	988	4021	38.60	8.0
Nuapada	3852	86	484	670	1240	32.19	2.5
Nabarangpur	5291	182	460	483	1125	21.26	2.2
Nayagarh	3890	186	965	531	1682	43.24	3.3



District	Geo-graphical Area	Very Dense Forest	Moderate Dense Forest	Open Forest	Total	Percent of GA	District Forest Area as a % to the total forest area of the state
Puri	3479	0	55	152	207	5.95	0.4
Rayagada	7073	428	860	1845	3133	44.30	6.2
Sambalpur	6657	531	1729	1098	3358	50.44	6.7
Sonepur	2337	2	196	132	330	14.12	0.7
Sundargarh	9712	1044	1771	1333	4148	42.71	8.2
Grand Total	155707	7042	21298	22007	50347	32.33	100.0

*Source: Bureau of Economics and Statistics, 2016-17*

## 1.4 Administrative Set up for Managing Forest Resources in Odisha

The forest department in the state operates through a number of departmental formations and autonomous bodies. The field formations under the forestry set up are organized under forest, wild life and kendu leaf wings. The Odisha Forest Development Corporation (OFDC) Ltd acts as the commercial wing of the forest department and discharges the functions of disposing various forest produces like kendu leaf, salvaged timber, bamboo and fire wood through 168 depots run by it.<sup>2</sup>

The state has 8 forest circles and 37 forest divisions under the PCCF. Apart from it, there are 13 wild life divisions with territorial jurisdiction and Nandankanan zoo under the PCCF (wildlife) and Wildlife Warden respectively. In addition to it, there are 3 kendu-leaf circles comprising of 19 kendu leaf divisions under the PCCF (KL) who are looking after collection and processing of kendu leaf. Further, there are 8 working plan divisions, one forest resources survey division, and 1 silvicultural division at Rayagada.<sup>3</sup> The organisational set up for of forest department is as per table-3 given below. CAMPA is mainly implemented under 50 territorial and wildlife divisions. There are 283 ranges which cover 1017 sections and 3683 beats.

*Table 1.3: Organisational set-up of forest Department*

Sl. No	Wings	Circles	Divisions	Ranges	Sections	Beats
1	Territorial	8	37	223	827	3082
2	Wildlife	Overlapping	13	60	190	601
	Territorial and Wild life total	8	50	283	1017	3683
3	Kendu leaf	3	19	153	657	
4	Training and Development	1	2			
5	Working Plan		8			
	Overall	12	79	436	1674	

<sup>1</sup> Annual Activity Report, 2016-17

<sup>2</sup> Ibid





## 1.5 Status of diversion of Forest Lands in Odisha

By virtue of Section-2 of Forest Rights (Conservation) Act, 1980, The Ministry of Environment, Forests and Climate Change, Govt. of India accords approval for diversion of forest land for non-forest purposes. As of 01.10.2016, about 57569.26 hectares of forest land had been diverted under the provisions of the said act. The details of such diversion are as per the table 1.4 given below.

*Table 1.4: Forest Area diverted for Non-forest purposes under Section-2 of Forest Rights (Conservation) Act, 1980*

Sl. No	Name of the Sector	No of Projects/ Cases	Forest Area Diverted (Ha)	% Share of Diversion
1	Irrigation	84	9777.46	20.6
2	Industry	26	4273.95	9.0
3	Mining	165	22024.47	46.3
4	Energy	06	116.45	0.2
5	Road/ Bridges	40	314.55	0.7
6	Railways	15	2240.30	4.7
7	Defence	04	3865.25	8.1
8	Human habitation	03	321.94	0.7
9	Transmission	60	3503.17	7.4
10	Others	41	1131.72	2.4
	<b>Total</b>	<b>444</b>	<b>47569.26</b>	<b>100.0</b>

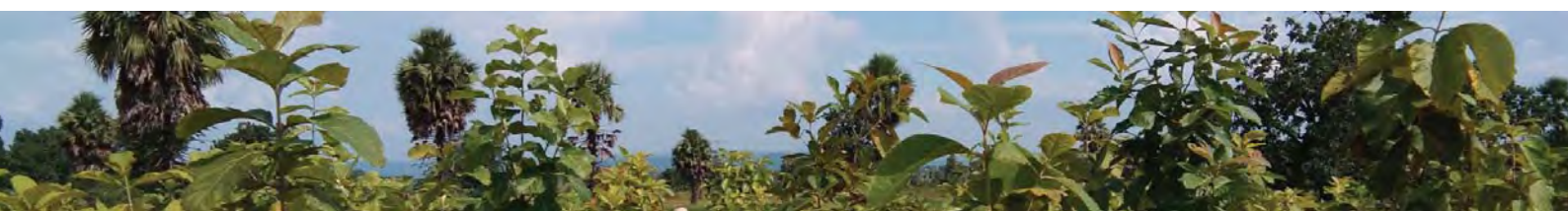
*Source: Annual Activity Report 2016-17*

Similarly, as per section 3(2) of the Forest Rights Act, 2006, the Ministry has authorized Divisional Forest Officers (DFOs) to grant permission for diversion of forest land up to 1.0 hectare in each case and which involves felling of trees not exceeding 75 per hectare for small projects of Govt. departments under 13 different categories of projects. As on 01.10.2016, about 257.924 ha. of forest land had been diverted. The details of such diversion are as per the table 1.5 given below.

*Table 1.5: Forest Area diverted for Non-forest purposes under Section-3(2) of Forest Rights Act, 2006*

Sl.	Name of the Sector	No of Projects/ Cases	Forest Area Diverted (Ha)	% Share of Diversion
1	Anganwadi	07	0.292	0.1
2	Water Harvesting Structure	17	5.562	2.2
3	Electric Line	195	92.807	36.0
4	Tank	08	4.414	1.7
5	Piped water	3	0.999	0.4
6	Road	178	113.675	44.1
7	School	42	21.346	8.3
8	Community Centre	23	15.027	5.8
9	Hospital	06	3.704	1.4
10	BSNL tower	07	0.098	0.0
	<b>Total</b>	<b>486</b>	<b>257.924</b>	<b>100.0</b>

*Source: Annual Activity Report 2016-17*



In addition to those two provisions, as per section 2 of Forest Rights (Conservation) Act, 1980, the Ministry has authorized the state Government to grant general approval for diversion of forest land upto 5 hectares in each case for creation of critical public utility infrastructure by government departments which involves felling of trees not exceeding 50 per hectare in left Wing Extremism (LWE) affected districts in 15 categories of projects. By the end of 01.10.2016, about 53.866 hectare of forest land has been diverted. The details of such diversion are as per the table 1.6 given below.

*Table 1.6: Forest Area diverted for Non-forest purposes under Section 2 of Forest Rights (Conservation) Act, 1980*

Sl. No	Name of the Sector	No of Projects/ Cases	Forest Area Diverted (Ha)	% Share of Diversion
1	Road	04	38.479	71.4
2	Stone Quarry	01	2.992	5.6
3	Police establishment	03	2.972	5.5
4	Drinking water supply	02	1.790	3.3
5	Power sub station	01	2.833	5.3
6	Irrigation	01	4.800	8.9
	<b>Total</b>	<b>12</b>	<b>53.866</b>	<b>100.0</b>

*Source: Annual Activity Report 2016-17*

As per e-Green watch data available, forest diversion for non-forest purposes for all forest circles comprising of all forest categories is to the extent of 130242 hectares by the end of December 2019. Of the total forest area diverted, percentage share of RF, Revenue Forests, PFs and proposed PFs stand at 32.5, 25.7, 2.8 and 39.0 percent respectively. Maximum proportion of forest land were diverted in Bhawanipatna circle followed by Rourkela and Angul circles.

*Table 1.7: Forest area diverted for non-forest purposes by Forest Circles and type of forests*

Circles	Forest Area diverted for other purposes (in Hectares)						% Share
	Reserved Forest (RF)	Revenue Forests	Unclassified	Protected Forests (PF)	Proposed PF	Total	
Angul	3135	13733		2013		18881	14.5
Baripada	577	231		12		820	0.6
Berhampur	746	211		8	21	986	0.8
Bhawanipatna	10151	3332		32	47849	61364	47.1
Bhubaneswar	64	802	7	140	102	1114	0.9
Koraput	3545	1303	25	7	29	4910	3.8
Rourkela	23221	11346		79	2759	37405	28.7
Sambalpur	896	2503		1363		4761	3.7
Grand Total	42334	33462	32	3655	50760	130242	100.0
% Share	<b>32.5</b>	<b>25.7</b>		<b>2.8</b>	<b>39.0</b>	<b>100.0</b>	

*Source: [http://egreenwatch.nic.in/FCAProjects/Public/rpt\\_Range\\_Forest\\_Type\\_Wise\\_Details\\_OF\\_Diverted\\_Land.aspx?SID=26](http://egreenwatch.nic.in/FCAProjects/Public/rpt_Range_Forest_Type_Wise_Details_OF_Diverted_Land.aspx?SID=26), retrieved on 18.01.2020*





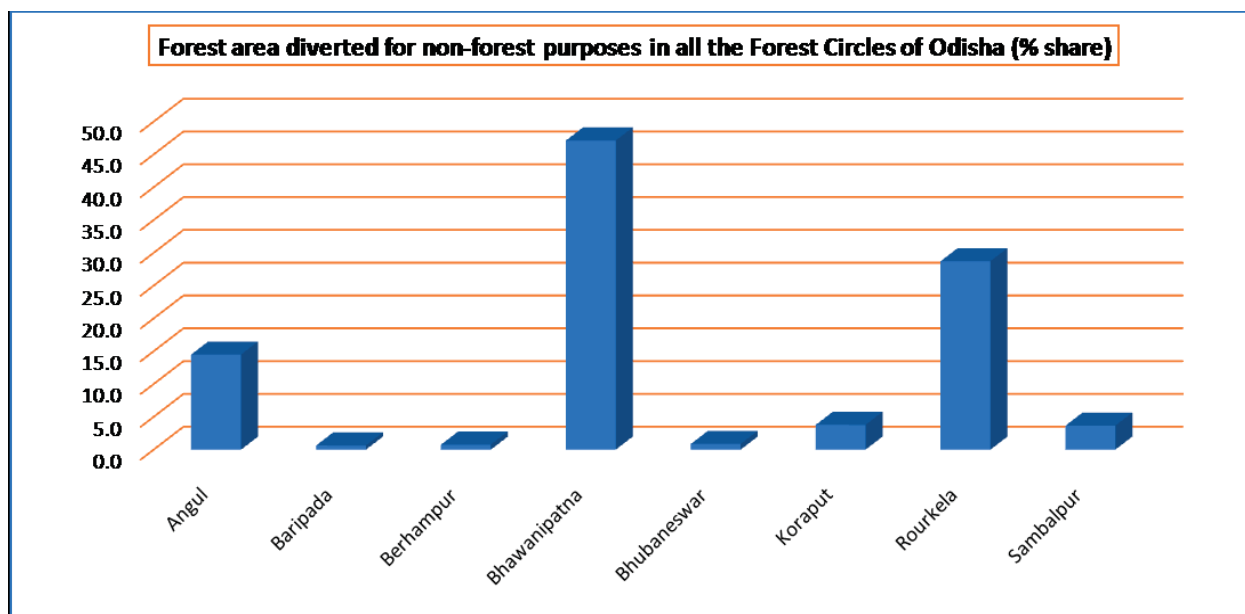


Figure 1:3: Distribution of forest area diverted for non-forest purpose in all the forest circles of Odisha

With the objective of conserving and protecting forest resources, Forest (Conservation) Act was enforced in the year 1980. On the top of such large scale continuous depletion of forest coverage in the country, the Forest (Conservation) Act 1980 mandated that whenever forest land is to be diverted for non-forestry purpose usually the conditions relating to transfer, mutation and declaration as Reserve Forest/Protected Forest, the equivalent non forest land for compensatory afforestation and funds for raising compensatory afforestation etc. are to be imposed. For mining purposes additional conditions like maintaining a safety zone area, fencing and regeneration etc. And for major and medium irrigation projects, catchment area treatment plans are to be stipulated. Further, the Act provided that the non-forest land for Compensatory Afforestation (CA) was to be identified contiguous to in the proximity of Reserved Forest or Protected Forest. In case, non-forest land of CA was not available in the same district, non-forest land for CA was to be identified anywhere else in the State/Union Territory. If non forest land was unavailable in the entire State/ UT, funds for raising CA in double the area in extent of the forest land diverted had to be provided by the user agency. The non-availability of suitable non-forest land for CA in the State/Union Territory would be accepted by the Central Government only on the Certificate of the Chief Secretary to the State/Union Territory Government to that effect. In case of central government/central undertaking projects, extraction of minor mineral from the river beds above 500 hectare, construction of link road, small water works, minor irrigation works, laying of transmission line upto 220 KVA etc., CA was to be raised on degraded forest land twice the forest area being diverted without insisting for the certificate of Chief Secretary regarding non-availability of non-forest land.

The funds for CA were to be recovered from the use regencies on the basis of the rates fixed by the State Forest Department which were site specific and varied according to the species, type of forest and site. The money received for Compensatory Afforestation, Additional Compensatory Afforestation etc. was to be used as per site specific schemes submitted by the State along with the approved proposals for diversion of forest land. After receipt of the money, State Forest Department was to accomplish the afforestation for which money is deposited in the Compensatory Afforestation Fund within a period of one year or two growing seasons. These funds were to be used towards the development, maintenance and protection of forest and wildlife management.



## 1.6 Pre- CAMPA Scenario

Due to certain discrepancies in the implementation of compensatory afforestation, some NGOs had approached the Supreme Court of India, about the non-utilization of funds collected for afforestation programmes in lieu of the depleted forest coverage in the country. Looking at the provisions of Forest (Conservation) Act 1980, on 29th October 2002, the Supreme Court of India directed that a 'Compensatory Afforestation Fund' was to be created in which all the money received from the user agencies towards compensatory afforestation, additional compensatory afforestation, penal compensatory afforestation, NPV of forest land, Catchment Area Treatment Plan Funds, etc. were to be deposited. Consequent to the Supreme court's order, the Ministry of Environment and Forests, Govt. of India notified on Compensatory Afforestation Fund Management and Planning Authority (CAMPA) on 23rd April 2004. In 2006, Supreme court ordered for the formation of Adhoc CAMPAs.<sup>4</sup>

## 1.7 Formation of National Advisory Council for CAMPAs

The Hon'ble Supreme Court on 10th July 2009 issued orders that there will be a Compensatory Afforestation Fund Management and Planning Authority (CAMPA) as National Advisory Council under the chairmanship of the Union Minister of Environment & Forests for monitoring, technical assistance and evaluation of compensatory afforestation activities. Compensatory Afforestation Fund Management and Planning Authority (CAMPA) are meant to promote afforestation and regeneration activities as a way of compensating for forest land diverted to non-forest uses.

The broad functions of National CAMPAs Advisory Council are as per the following.

- Lay down broad guidelines for State CAMPAs.
- Facilitate scientific, technological and other assistance that may be required by State CAMPAs.
- Make recommendations to State CAMPAs based on a review of their plans and programmes.
- Provide a mechanism to State CAMPAs to resolve issues of an inter-state or Centre-State character.

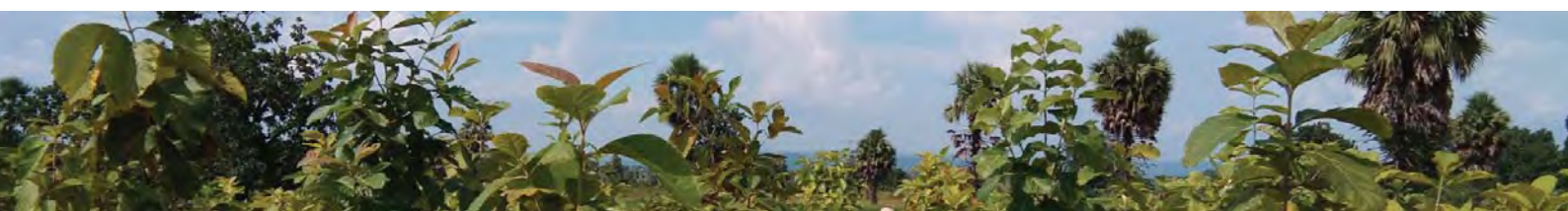
## 1.8 State CAMPAs

In the same year, states had set up State CAMPAs that receive 90% of funds from National CAMPAs to use for afforestation and forest conservation.<sup>5</sup>

- The State CAMPAs would presently receive funds collected from user agencies towards compensatory afforestation, additional compensatory afforestation, penal compensatory afforestation, Net Present Value (NPV) and all other amounts recovered from such agencies under the Forest (Conservation) Act, 1980 and presently lying with the Adhoc CAMPAs.
- The State CAMPAs would administer the amount received from the Adhoc CAMPAs and utilize the funds collected for undertaking compensatory afforestation, assisted natural regeneration, conservation and protection of forests, infrastructure development, wildlife conservation and protection and other related activities and for matters connected therewith or incidental thereto.

<sup>4</sup> Comptroller and Auditor General of India (2013): "Compensatory Afforestation in India", Report no-21

<sup>5</sup> Ministry of Environment and Forests, 2009. The Guidelines on State Compensatory Afforestation Fund Management and Planning Authority (State CAMPAs), Government of India, Dated 2nd July 2009





- State CAMPA would provide an integrated framework for utilizing multiple sources of funding and activities relating to protection and management of forests and wildlife. Its prime task would be regenerating natural forests and building up the institution engaged in this work in the State Forest Department including training of the forest officials of various levels with an emphasis on training of the staff at cutting edge level (forest range level). In short, the department would be modernized to protect and regenerate the forests and wildlife habitat.
- It seeks to establish the National Compensatory Afforestation Fund under the Public Account of India, and a State Compensatory Afforestation Fund under the Public Account of each state.
- The payments into the funds include compensatory afforestation, NPV, reforestation and any project specific payments. The National Fund will get 10% of funds collected and the remaining 90% will go to respective State Fund.
- The collected funds will be utilized for afforestation, regeneration of forest ecosystem, wild life protection and infrastructure development.
- The bill also seeks to establish National and State Compensatory Afforestation Fund Management and Planning Authorities to manage the funds.
- The determination of NPV will be delegated to an expert committee constituted by the central government.

## 1.9 CAMPA Act, 2016

In 2013, a CAG report identified that the funds continued to be underutilized. The Compensatory Afforestation Fund Bill 2015 was introduced by the government in Lok Sabha on May 8, 2015 to emulate collected funds. The bill was sent for examination under a standing committee. It was passed by Rajya Sabha on 28 July 2016. CAMPA Act or Compensatory Afforestation Fund Management and Planning Authority bill is an Indian legislation that seeks to provide an appropriate institutional mechanism, both at the Centre and in each State and Union Territory, to ensure expeditious utilization in efficient and transparent manner of amounts released in lieu of forest land diverted for non-forest purpose which would mitigate impact of diversion of such forest land. The legislation established the Compensatory Afforestation Management and Planning Authority (CAMPA) and the Compensatory Afforestation Fund (CAF). The legislation sought expeditious utilization of accumulated unspent amounts available with the Adhoc Compensatory Afforestation Fund Management and Planning Authority (Adhoc CAMPA). At that time, it was estimated that an amount of Rs. 39,000 crore was the unspent compensatory fund for forest regeneration and an interest on accumulated unspent balance, amounting to approximately Rs. 6,000 crore per annum. The act intended for an efficient fund management of the previously accumulated funds in a transparent manner. The key highlights of CAMPA Act, 2016 is shown in the box given alongside. With the provisions of the said Act, The Compensatory Afforestation Fund Management and Planning Authority (CAMPA) has been a national programme funded by the Ministry of Environments, Forests and Climate Change, Govt of India being implemented in all the states of the country.

## 1.10 Implementation of CAMPA in Odisha

The Compensatory Afforestation Fund Management and Planning Authority (CAMPA) Odisha was constituted vide Notification No. 13995/F&E dated 14.08.2009 with an objective of Conservation, Protection, Regeneration and Management of existing natural forests, Wildlife and their habitat and raising Site Specific compensatory Afforestation, Penal compensatory Afforestation etc. As per the provisions of CAMPA guidelines, the state CAMPA has been formulating Annual Plans of Operation (APO) for all the



years since 2009-10. Since 2009-10 and upto 2016-17, an amount of Rs. 182215.00 is released by Govt. of India to Odisha state for implementation of CAMPA. Odisha's share in overall CAMPA allocation stand more than 26 percent in all the years. Considering all the years Odisha has received around 31 percent of the overall allocation of funds released from the Centre for implementing CAMPA activities. It is further observed from the following table that the growth rate in the receipt of funds is found negative in two years 2013-14 and 2016-17. Compared to 2012-13, there was 12.54 percent reduction in the receipt of funds by state CAMPA from Adhoc CAMPA and similarly compared to the year 2015-16, there was 43.43 percent reduction in the year 2016-17.

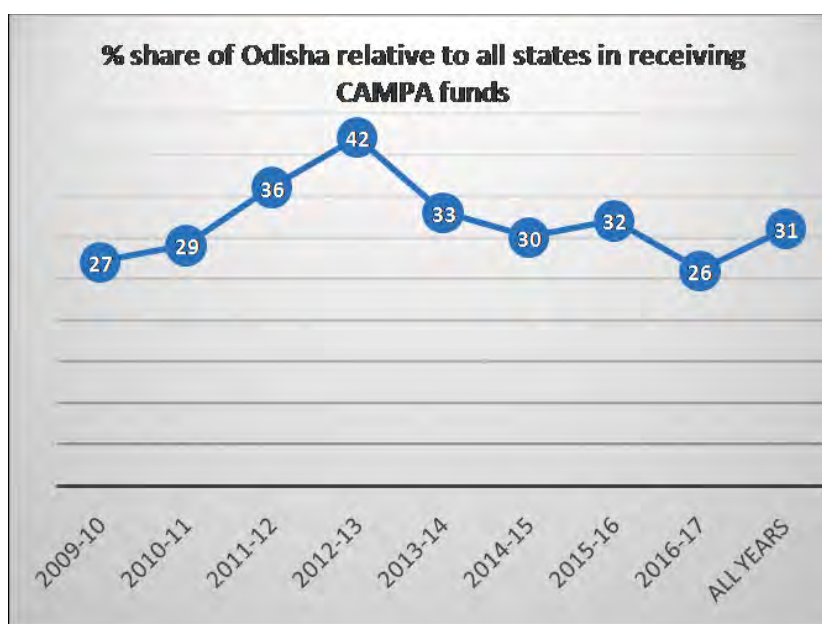


Figure 1:4- Distribution of percentage share of Odisha relative to all states in receiving CAMPA funds

Table 1.8: Details of funds transferred by Gol to state

S. No.	Year	Funds received by Odisha (lakh Rs.)	Funds received by All States (lakh Rs.)	% share of Odisha	Growth in receipt of funds (year on Year basis-YoY)
1	2009-10	13106	48859	27	
2	2010-11	14018	48634	29	6.96
3	2011-12	17609	48582	36	25.62
4	2012-13	20582	48669	42	16.88
5	2013-14	18000	54922	33	-12.54
6	2014-15	32200	106621	30	78.89
7	2015-16	42600	132901	32	32.30
8	2016-17	24100	93618	26	-43.43
9	All Years	182215	582806	31	

Source- Office of the State CAMPA, Odisha





Under CAMPA implementation in Odisha, several activities have been taken up for preservation and development of natural forests, afforestation of degraded forest area, forest protection, forest fire management, management of wildlife, capacity building, research and development, infrastructure development and other allied activities since the year 2009-10. The components and sub components of CAMPA implementation in Odisha is as outlined in the following table-1.9.

*Table 1.9: Components and sub- components of CAMPA intervention*

Sl. No	Major Components	Sub- Components
1	Site Specific Compensatory Afforestation (CA), Additional Compensatory afforestation, safety zone plantation, Avenue plantation	<ul style="list-style-type: none"> <li>• Catchment Area Treatment Plan</li> <li>• Block Plantation</li> <li>• Bald hill Plantation</li> <li>• Compensatory afforestation</li> </ul>
2	Conservation, Regeneration and Management of Natural Forest (CRM)-	<ul style="list-style-type: none"> <li>• Regeneration of degraded bamboo forests</li> <li>• Subsidiary Silvicultural operations in timber crops.</li> <li>• ANR Plantation</li> <li>• Bald hill plantation</li> <li>• AR Plantation</li> </ul>
3	Forest Protection (Protection)	<ul style="list-style-type: none"> <li>• General Protection</li> <li>• Fire Protection</li> </ul>
4	Infrastructure Development (Infrastructure)	<ul style="list-style-type: none"> <li>• Buildings</li> <li>• Roads, Causeway, Culvert, Bridge</li> <li>• Water Bodies</li> <li>• Tube well</li> <li>• Seizure yard, Malkhana</li> </ul>
5	Wildlife Management (WL)	<ul style="list-style-type: none"> <li>• Infrastructure Development</li> <li>• Habitat Improvement</li> <li>• Zoo Management</li> <li>• Research Activities</li> <li>• Training and Capacity building</li> <li>• Implementation of site-specific wildlife conservation plan</li> <li>• Relocation of Villages</li> <li>• Elephant- train collision mitigation plan</li> <li>• Anti-Poaching Barrack/ Watch tower/ anti-poaching check gate</li> <li>• Communication</li> <li>• Strengthening of crime cell (Circle level)</li> <li>• Equipment</li> </ul>
6	Capacity Building	<ul style="list-style-type: none"> <li>• Research Activity on adaptive research</li> <li>• Tree improvement programmes</li> <li>• Maintenance of research gardens</li> </ul>
7	Ama Jungle Yojana	<ul style="list-style-type: none"> <li>• Entry Point Activity</li> <li>• AR Plantation</li> <li>• ANR Plantation</li> <li>• JFM Management</li> </ul>
8	Sacred Grooves	<ul style="list-style-type: none"> <li>• Conservation and development</li> </ul>



- a) **Compensatory Afforestation (CA)** - Compensatory Afforestation (CA) refers to afforestation and regeneration activities carried out as a way of compensating for forest land diverted to non-forest purposes.
- b) **Conservation, Regeneration and Management of Natural Forest (CRM)**- Management of Natural Forest concerned with overall administrative, economic, legal, and social aspects, as well as scientific and technical aspects, such as silviculture, protection, and forest regulation. Conservation of Natural Forest is the practice of planning and maintaining forested areas for the benefit and sustainability of future generations. Forest conservation involves the upkeep of the natural resources within a forest that are beneficial to both humans and the ecosystem.
- c) **Forest Protection** –Forest Protection under CAMPA includes protection of forest against fire as well as includes general protection activities such as Maintenance of Forest Checking station, Maintenance of Forest Boundary, creation of Protection squad
- d) **Infrastructure Development (Infrastructure)**- Various Infrastructure development activities have been undertaken under the CAMPA project including development of water facilities, constructions of common toilets, causeways, tube well, etc.
- e) **Wildlife Management (WL)**- The Wildlife Management includes protection of the forests, its resources, wildlife as well as the human settlement in and around the forest. Wildlife Management also includes human animal conflict management and research studies and other conservation works under CAMPA.
- f) **Capacity Building**- Under CAMPA intervention, a lot of capacity building activities particularly about forest conservation and protection have been undertaken. Under this component, personnel of the forest department, GoO, as well as members of JFM committees have been trained towards better protection and conservation of forest resources.
- g) **Ama Jungle Yojana**- The AJY, which is being implemented by the Odisha Forestry Sector Development Society, is aimed at promoting sustainable forest management in the State on participatory mode with Vana Surakshya Samities (VSS). By March 2018, 3,180 VSSs have been entrusted with responsibility of developing and taking care of around 50 hectares of forest each. The activities like silvicultural operations, soil and moisture conservation, fire line tracing, checking of forest fire, natural regeneration, increasing density of degraded forest, assisted natural regeneration, entry point developmental activities in the forest villages etc are taken up through these VSSs. There is funding support under CAMPA for Ama Jungle Yojana.
- h) **Sacred Groves**- Sacred groves are the places within forest area or in the forest fringe villages where mostly the tribals perform their religious rites with much devotion and dedication. They prohibit human interference, especially of outsiders, with their groves fearing that any disturbance in the area might upset the presiding gods. The CAMPA APOs do have provisions for promoting such sacred groves

### 1.11 The Assignment

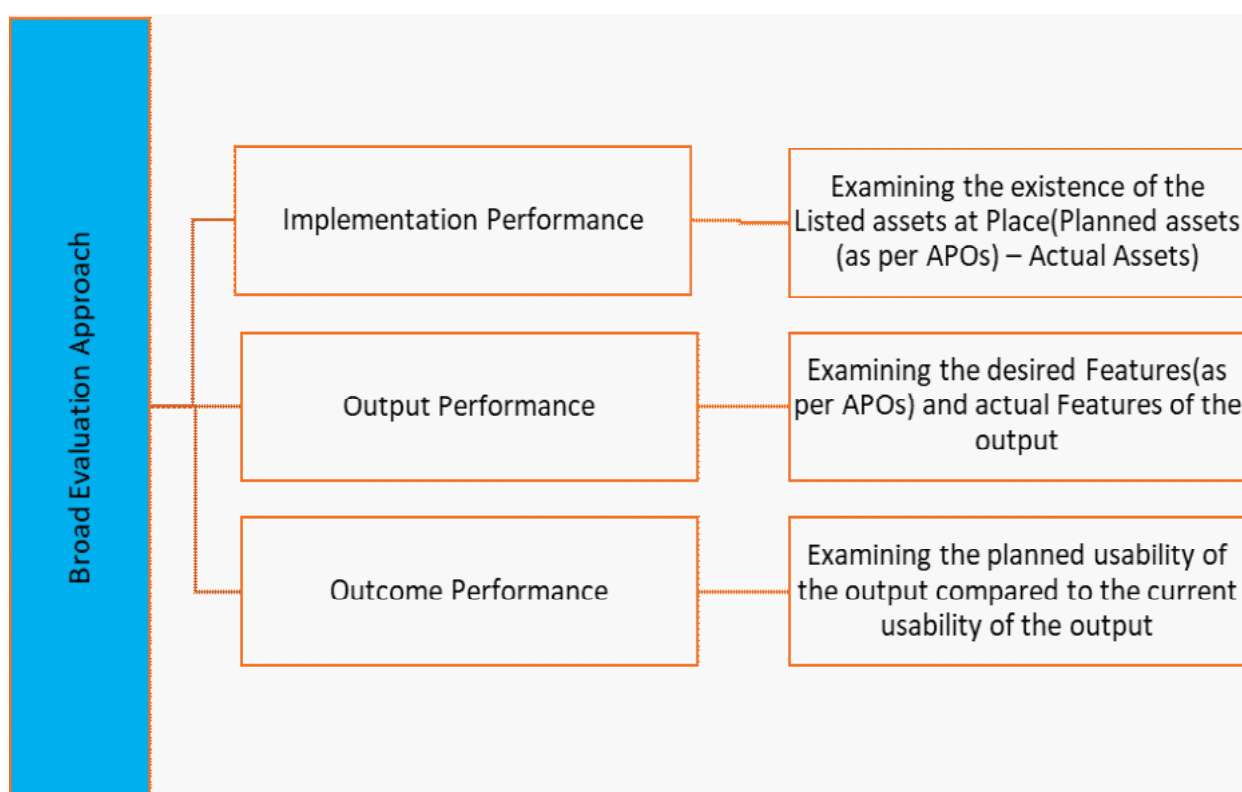
Office of the Chief Conservator of Forest, CAMPA, Odisha with the objective of a technical evaluation of all the ongoing activities under CAMPA by a third-party evaluator has commissioned the study to CTRAN consulting Ltd, Bhubaneswar. The broad scope of the study comprises evaluation of all interventions made out of CAMPA funds during the period 2009-10 to 2016-17. (letter no- 19480/10F (CAMPA)- 07/11 (Part), dated 20th September, 2018, Bhubaneswar).





## 1.12 Study Approach

Taking into account the objectives and scope of study, broadly the evaluation of CAMPA interventions followed Intervention, Output, Outcome assessment framework. For checking out implementation procedure for all the components and sub components, it was examined that how far CAMPA APOs were followed while implementing CAMPA at bit level and if deviations are noticed, the reasons for such deviation were identified. Similarly, for analysing performance outputs as a result of CAMPA intervention, activities carried out under all of the components and sub components of CAMPA implementation during the period 2009-10 to 2016-17 were considered. The implementation performance was assessed by comparing actual works with the works mentioned in the respective year wise Annual Plans of Operations prepared by the forest divisions and forest ranges. The outcomes from the range of outputs were assessed from the perspective of usability and efficiency of the CAMPA assets from the points of view of ultimate users. Apart from impact assessment of all such assets were made in consultation with forest department officials as well as personal observation and assessment of the evaluator. With objective of assessing the strength of implementation, planned intervention as per APOs was compared with actual intervention undertaken. Similarly, status of outputs and outcomes were analysed by comparing creation of actual physical assets as against the planned assets and desirable usability of an asset with actual usability of the asset.



While doing so, Field observation, Focus Group Discussion with community members/ JFM members, Key Informant Interview (KII), Stakeholder discussions with relevant Forest Department officials involved for CAMPA implementation were undertaken. The secondary data as per the requirement of the study were obtained from the PCCF's office, divisional and range offices of forest department. Besides, the study also utilized time series data on the interventions for all the components and sub components.



### 1.13 Study Area

The evaluation study covers all forest circles covering all the 56 forest divisions of Odisha (37 are territorial, 13 wildlife divisions and 6 R & D divisions). In addition to it, Nandankanan zoo, Research and Training establishments where CAMPA funds are utilized are also covered in the study.

#### 1.13.1 Study Coverage:

The study covered all the eight forest circles under different components of CAMPA. The forest circles covered are (1) Angul, (2) Baripada, (3) Berhampur, (4) Bhubaneswar, (5) Kalahandi, (6) Koraput, (7) Rourkela and (8) Sambalpur. Under the forest circles, the study covered all the 56 forest divisions. Details are presented below. Under plantation and silvicultural operation component, the study covered 898 plots from 314 sites in 47 forest divisions, 151 forest ranges, 287 forest sections and 337 forest beats of eight circles that have CAMPA interventions.

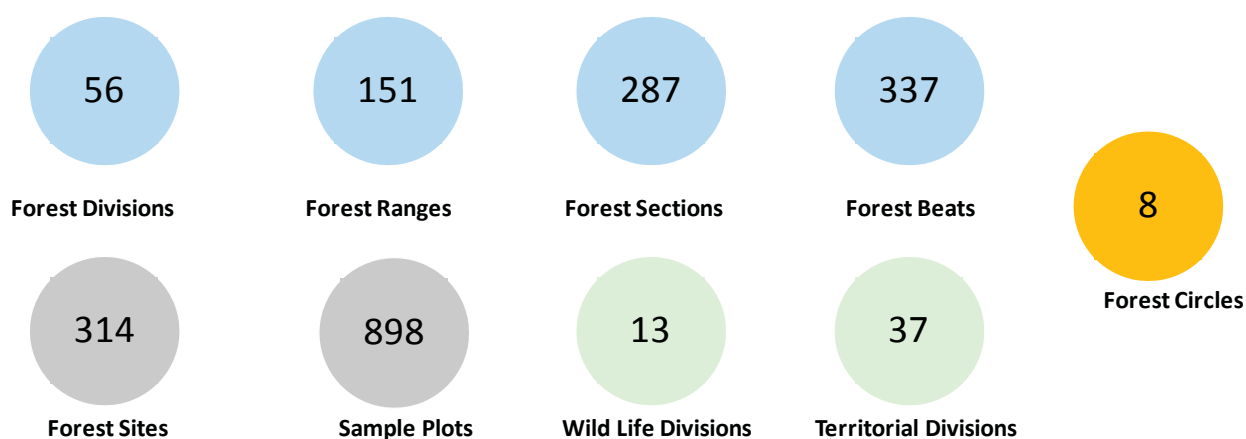


Figure 1.5: Assessment Coverage

Table 1.10: Distribution of Forest Divisions

SN	Division	Circle							
		Angul	Baripada	Berhampur	Bhubaneswar	Kalahandi	Koraput	Rourkela	Sambalpur
1	Angul	√							
2	Athagarh	√							
3	Athamallik	√							
4	Balangir					√			
5	Balasore		√						
6	Balliguda			√					
7	Bamra WL								√
8	Bargarh								√
9	Baripada		√						
10	Berhampur			√					
11	Bonei							√	
12	Boudh			√					





SN	Division	Circle							
		Angul	Baripada	Berha- mpur	Bhuban- eswar	Kalahandi	Koraput	Rourkela	Samb- alpur
13	Chandaka				√				
14	Chilika WL				√				
15	City Forest				√				
16	Cuttack	√							
17	Deogarh							√	
18	Dhenkanal	√							
19	Ghumusur (N)			√					
20	Ghumusur (S)			√					
21	Jeypore						√		
22	Jharsuguda								√
23	Kalahandi (N)					√			
24	Kalahandi (S)					√			
25	Karanjia		√						
26	Keonjhar							√	
27	Keonjhar WL		√						
28	Khariar					√			
29	Khordha				√				
30	Koraput						√		
31	Mahanadi WL	√							
32	Malkangiri						√		
33	Nabarangapur						√		
34	Nayagarh				√				
35	Paralakhemundi			√					
36	Phulbani			√					
37	Puri				√				
38	Rairakhol								√
39	Rairangapur		√						
40	Rajnagar WL				√				
41	Rayagada						√		
42	Rourkela							√	
43	Sambalpur								√
44	Satakoshia WL	√							
45	Sonepur					√			
46	Sunabeda WL					√			
47	Sundargarh							√	



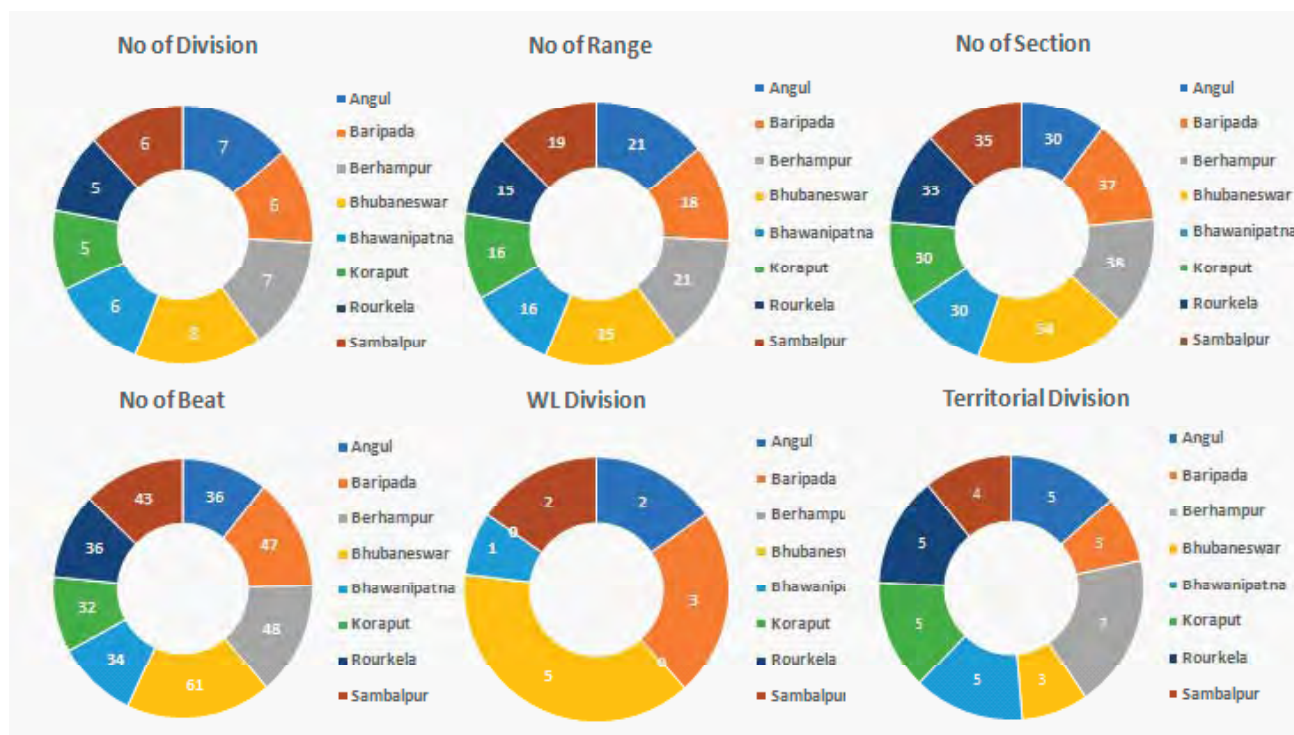


Figure 1:6: Study Coverage by Forest Circle

The study covered 314 forest sites, encompassing plantation sites, sites under silvicultural operations and different infrastructural facilities / assets created under CAMPA. Of the total site coverage, 79.9 percent are plantation sites and 20.1 percent are sites under silvicultural operations. The infrastructural facilities and services (created assets) along with SMC works were assessed across all the sites in each forest circle and division.







Figure 1.7: Site Distribution by Plantation / Silviculture

Table 1.11: Distribution of Sites / Plots by Planation and Silvicultural Operations

Plantation	% of Plantation	% of Total	Silviculture	% of Silviculture	% of Total
AJY Block Plantation	0.5	0.3	ANR W GP	9.3	2.6
ANR GP	59.0	42.8	ANR W GP (AJY)	16.2	4.5
Avenue Plantation	2.3	1.7	Management of Old Teak	5.7	1.6
Bald Hill Plantation	4.6	3.3	SSO Bamboo	52.2	14.4
Bamboo Plantation	2.2	1.6	SSO Timber	16.6	4.6
Block Plantation	26.4	19.2	<b>Total</b>	<b>100.0</b>	<b>27.5</b>
CA ANR GP	1.2	0.9			
CA PCA (Mangrove)	0.3	0.2			
CA PCA Block Plantation	1.8	1.3			
CA-Safety Zone Plantation	0.2	0.1			

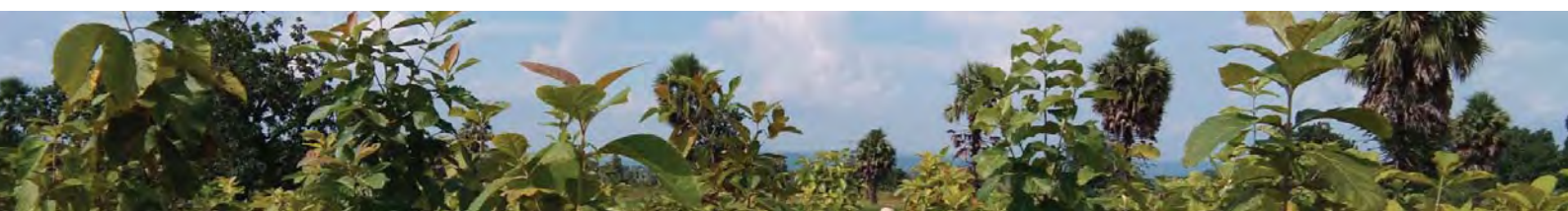


Plantation	% of Plantation	% of Total	Silviculture	% of Silviculture	% of Total
Corridor Fodder Plantation	0.3	0.2			
Fruit Bearing Plantation	0.2	0.1			
Mangrove Plantation	0.2	0.1			
OWP	0.2	0.1			
PCA-ANR GP	0.6	0.4			
Urban plantation (fruit bearing)	0.2	0.1			
<b>Total</b>	<b>100.0</b>	<b>72.5</b>			

The plantation sites cover, among others, (1) ANR with gap plantation (59.0 percent), (2) bald hill plantation (4.6 percent), (3) avenue plantation (2.3 percent), (4) block plantation sites (26.4 percent). In silvicultural operation, the study covered (1) ANR without gap planation (16.2 percent), (2) SSO Bamboo (52.2 percent), (3) SSO timber (16.6 percent) and (4) ANR without gap plantation (AJY) (16.2 percent). The study also covered old teak management. Circle and Division level distribution of sites are presented in the figures.

Table 1.12: Distribution of Plantation & Silvicultural Sites

Plantation/ Silviculture	Forest Circles							
	Angul	Baripada	Berha- mpur	Bhuban- eswar	Kalahandi	Koraput	Rourkela	Samb- alpur
AJY Block Plantation					√		√	
ANR GP	√	√	√	√	√	√	√	√
ANR W GP			√					√
ANR W GP (AJY)	√	√	√			√	√	√
Avenue Plantation	√	√	√	√	√			
Bald Hill Plantation	√	√	√	√	√	√	√	
Bamboo Plantation	√						√	√
Block Plantation	√	√	√	√	√	√	√	√
CA ANR GP			√				√	
CA PCA (Mangrove)				√				
CA PCA Block Plantation				√			√	√
CA-Safety Zone Plantation							√	
Corridor Fodder Plantation								√
Fruit Bearing Plantation					√			
Management of Old Teak			√		√		√	√
Mangrove Plantation				√				
OWP					√			
PCA-ANR GP							√	





Plantation/ Silviculture	Forest Circles							
	Angul	Baripada	Berha- mpur	Bhuban- eswar	Kalahandi	Koraput	Rourkela	Samb- alpur
SSO Bamboo	√		√	√	√	√	√	√
SSO Timber	√	√	√	√		√		√
Urban plantation				√				

### 1.14 Study Methodology

The assessment study is comprehensive in view of multiple components and sub components of intervention under CAMPA. All the activities under CAMPA intervention are evaluated in all forest divisions of all eight circles. The sampling procedure adopted in the study was different for different components in view of the diversity and nature of work evaluated. The source of data collection and sampling methodology is given in the following table 1.13.

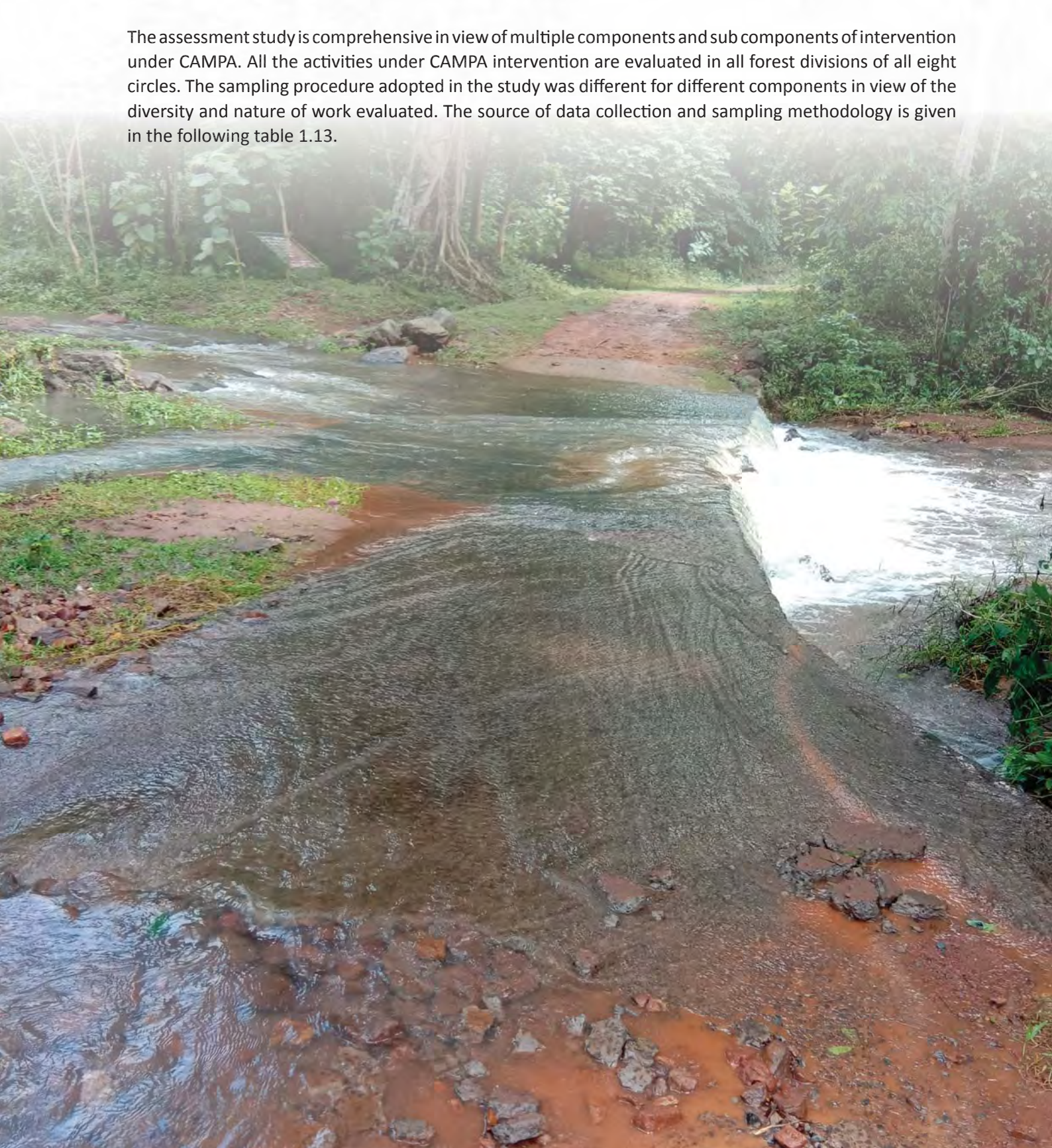




Table 1.13: Component and Sub component wise Sampling criteria, Source of data and tools for data collection

S. No	CAMPA Component	Sub Component	Sampling Criteria as per RFP	Source of data	Tools	Sample Size
1	Plantation Evaluation	i Block	10% plantation sites will be randomly selected from each division	DFO/ Range office/ sample-based field assessment	Check List for assessment of Block Plantation	As detailed out in the sampling of plantation evaluation.
		ii Bald hills			Check List for assessment of Bald hill Plantation	
		iii Compensatory afforestation			Check List for assessment of Compensatory Afforestation	
		iv Avenue Plantation			Check List for assessment of Avenue Plantation	
		v RDF/ANR - with or without gap plantation	Sampling should be done in 10% of the plantation sites in each division. Quadrata method of sampling may be used for assessing natural regeneration (1Mt x 1 Mt): Quadrata Method of sampling 1mt X 1mt		Check List for assessment of ANR/ RDF Plantation	
		vi Subsidiary Silvicultural Operations of Bamboo (a) Bamboo (b) Timber			Check List for assessment of silvicultural activities under bamboo and timber plantation	
		vii Distribution of Seedlings	10 percent of the beneficiaries received seedlings	Beneficiaries Listing from range office, Household Interview with seedling beneficiaries	Seedling Beneficiary questionnaire	





S. No	CAMPA Component	Sub Component	Sampling Criteria as per RFP	Source of data	Tools	Sample Size
2	Soil and Moisture Conservation Measure	Different types of SMC works undertaken	10% sampling of all SMC works is to be done in all the Divisions wherever work is done	DFO/Range office/ sample-based field assessment	Checklist for SMC works	10 percent of the total no of SMC works undertaken per division and
3	Forest Protection	i General Protection	Secondary data, verification of assets and other details with personal observation	Checking the register and interview with forest officials	Check list for forest protection activities	10 percent of the total assets or intervention undertaken per division
		ii Fire Protection	Secondary data as well as primary data through VSS meetings, and physical verification/ observation	Data collection from forest range office, VSS meetings, Verification of Registers		
4	Infrastructure development	i Buildings	Secondary data, verification of assets and other details with personal observation	Visual assessment, interviews with officials and communities	Check list for Infrastructure development	10 percent of the total assets or intervention undertaken per division
		ii Roads, Causeway, Culvert, Bridges				
		iii Water bodies				
		iv Tube well				
		v Seizure yard, Malkhana				
		Protection Activities				
5	Capacity Building & Research	No of training Programmes conducted and research activities undertaken	Secondary data analysis and interview with the beneficiaries of trainings	Information collection from the official records	Check list for Capacity development assessment	2 training beneficiaries per division are to be interviewed for developing cases study
6	Information Technology	Usage of IT for enhancing efficiency	Secondary data, verification of assets and KII		Checklist for assessing IT	Random verification of assets for two ranges



S. No	CAMPA Component	Sub Component	Sampling Criteria as per RFP	Source of data	Tools	Sample Size
7	Wild Life Management	i Anti-Depredation Activities	Secondary data, Interaction with community members, KII	Checking human animal conflicts, KIIIS, visual assessments	Check list for wild life management	Sample verification of implemented activities under three forest ranges per division.
		ii Communication				
		iii Infrastructure Development				
		iv Habitat Improvement				
		v Zoo Management				
		vi Research Activities				
		vii Training & Capacity Building				
		viii Implementation of site-specific wildlife conservation plan				
		ix Relocation of villages				
		x Elephant - train collision mitigation plan				
8	Ama Jungle Yojana	i Boundary Clearance for survey				One scheme was evaluated under Phulbani forest division.
		ii RCC Pillar construction and posting				
		iii Micro Plan				
		iv Capacity building				
		v Forest restoration (JFM/ SMC)				
		vi ANR				

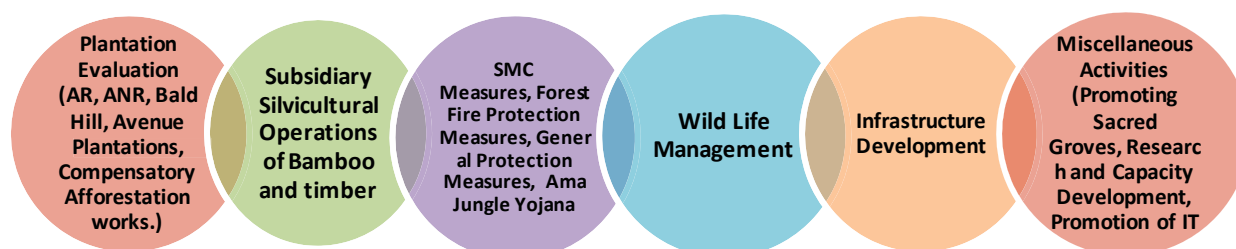




## 1.15 Techniques for Data Collection

- **Primary Data:** By using separate designed formats for different components and subcomponents, the first-hand information was directly obtained in relation to the study.
- **Secondary Data:** Secondary data are mostly related to various activities undertaken in CAMPFA which were collected from the PCCF, Divisional offices and range offices, from files, reports and other secondary sources.
- **Focus Group Discussion:** FGDs with the members of the Ama Jungle Yojana committee members were conducted. As the study came across only one Ama Jungle Yojana at Phulbani forest division, so, only one FGD was conducted.
- **Key Informant Interview (KII) and Consultation with Forest Officials:** KII and consultation was undertaken with a range of forest officers involved at various stages- planning and decision making, implementation, monitoring and evaluation. This included Chief Conservator of Forest (CCF), Conservator of Forest (CF), Divisional Forest Officer (DFO), Ranger Officers (Rangers), Foresters, Forest Guards etc.
- **Field Observation:** The study while visiting different plantation and other sites also prepared notes on various activities under CAMPFA implementation which provides strong basis for the entire evaluation process.

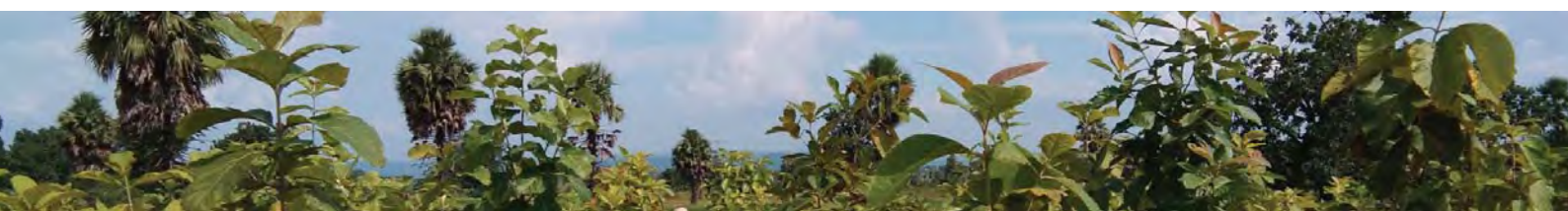
## 1.16 Components Evaluated



## 1.17 Plantation evaluation

The sampling of plantation sites was done on the basis of Stratified Random Sampling. This is to mention that under CAMPFA fund, various types of plantation activities include Artificial Regeneration (AR), Assisted natural regeneration (ANR), Interventions in bald hills (hills without any vegetation), Avenue plantations, and Compensatory afforestation. The evaluation methodology for AR, AR in bald hills and compensatory afforestation followed the format prescribed by the Odisha Forest Department - Project Management Unit (PMU). Each sample plot was marked on a map of plantation site. Along with those photographs with date and time, geo-coordinates (using GPS instrument) of each sample plots were also recorded.

**Sampling of Plantation Sites:** The number of plots sampled out was determined for the overall plantation sites taken up by all the forest divisions in Odisha during the period 2009-10 to 2016-17. As for individual forest divisions, the data on the number of sites will be collected during our visit to concern forest division, so with the readily available data of Angul forest division which was collected during our scoping visit about no of sites and area under different plantations for all the years, the number of sites per 1000 hectares of plantation was calculated with the objective of determining the number of plantation sites under



plantation under CAMPA in the state comprising of all forest divisions. **It was calculated that that there are 241 plantation sites and the total forest area covered accounts 26624 hectares. So, there are 9 sites per 1000 hectare of plantation in Angul district. From the secondary data obtained from forest department, it was calculated that there was plantation of 1195395 hectares under CAMPA in all the forest divisions of the state during the period 2009-10 to 2016-17. So, by extrapolating the no of planation sites per 1000 hectare of planation area of Angul division, the number of plantation sites for all the forest divisions was estimated at 10758.**

The overall plantation sites so arrived constituted the population size of plantation sites covered under CAMPA funds. For determining the representative number of sample size of plantation sites for all the forest circles, the level of precision (sampling error) was fixed at  $\pm 5$  percent, the confidence level was fixed at 95 percent and the degree of variability was assumed at 0.5 percent indicating maximum variability between population parameter and sample statistic is to the extent of 0.5 points. For determining the sample size, following formula was used to arrive at sample no of sites.

$$\begin{aligned}\text{Sample size } (n_0) &= z^2 pq / e^2 = (1.96)^2 (0.5) (0.5) / (.05)^2 \\ &= 385 \text{ sample number of sites}\end{aligned}$$

However, for arriving at exact number of sites to be sampled out with finite population of **10758 sites**, following formula was used.

$$\text{Sample size } (n_0) = n_0 / 1 + (n_0 - 1) / N = 385 / 1 + (385 - 1) / 10758 = 372 \text{ sites.}$$

**Sample no Sites per forest division:** Considering overall sample size of 372 number of plantation sites for all forest divisions, and equally distributing it over all the 50 forest divisions in Odisha, there are about 7 plantation sites for each forest division. While evaluating plantation sites, It was ensured that all categories of plantations carried out under CAMPA were covered. If more than seven categories of plantations are done with CAMPA funds, additional sites are covered in the study.

**Sample no of plots per plantation site:** Further, stratified random sampling was considered for determining sample plots considering the size of the plantation sites (Hectare area of plantation) as the units of stratification. The number of plots considered for the sampled-out sites for polyculture type of plantations is considered on the higher side compared to monoculture type of plantations sites in view of the species diversity in polyculture type of plantations. The plot scheme for both types of plantation sites is as per the box given below.





**Plot scheme:**

Monoculture Plantation	Polyculture Plantation
<ul style="list-style-type: none"> <li>• &lt; 25 Ha - one sample plot</li> <li>• &lt; 50 Ha - two sample plots</li> <li>• &lt; 75 Ha - three sample plots</li> <li>• &gt; 100 Ha – four sample plots</li> </ul>	<ul style="list-style-type: none"> <li>• &lt; 25 Ha –two sample plots</li> <li>• &lt;50 Ha - three sample plots</li> <li>• &lt;75 Ha - Four sample plots</li> <li>• &gt;100 Ha – five sample plots</li> </ul>

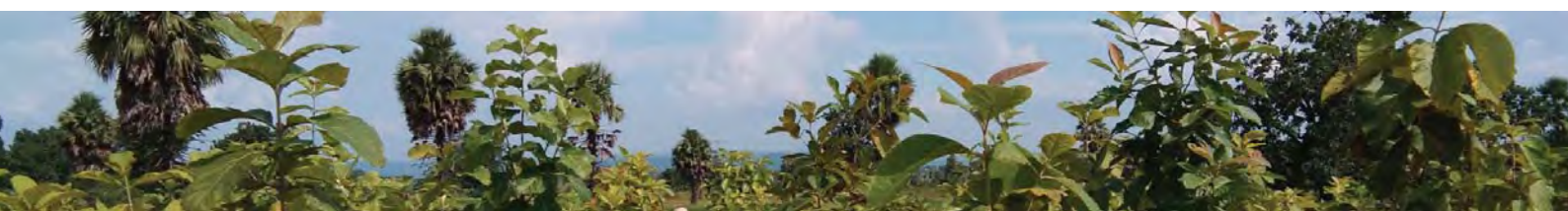
*N:B: The plot size is 0.1 Ha which is equivalent to 1000m<sup>2</sup> [31.62m x 31.62m]. In each plot, the total number of planted species are counted for finding out the survival rate. In addition, GBH/GCH, height and other parameters are also assessed.*

**Determining Sample Plots within Sample Sites**

After reaching the plantation site, randomly preferably 30 metres inside the approach point, a central point was fixed and thereafter with the objective of setting four corners of a square plot, the NE at 45°, SE at 135°, SW at 285° & NW at 310° corners of the plot by measuring 22.36 m. horizontal distance (i.e. half of the diagonal) by in all four directions were earmarked. These four corners were marked by thin poles. A plastic rope was tied at the top end of these corner posts for getting clear visibility from different spots in the plot. All sides measuring 31.62 metres horizontal distance were once again ascertained by the members of study team. Each of the selected plots was visited by the monitoring team and the details as mentioned in the box given alongside were documented on field. For all sampled out plantation plots, following parameters were physically examined.

- Plot location and area
- Plantation model type and design
- Age of the plantation
- Number of saplings planted initially (species wise)
- Height of the saplings when planted
- Number of plants surviving at the time of monitoring
- Average height of surviving plants
- Species composition and distribution
- Protection system and maintenance
- Anthropogenic pressure (Grazing Pressure or illicit cutting)

- **Survival rate of the plantation**
  - o Total number of saplings planted at the plot ( $N_0$ )
  - o Number of plants surviving currently ( $N_1$ )
  - o Overall survival rate of the planted saplings at the plot
- **( $N_1/N_0 * 100$ ) and mortality rate [ $(N_0 - N_1)/N_0 * 100$ ]**
  - o Species wise survival rate of the planted saplings at the plot
  - o Species wise and year wise casualty replacement done.
- **Average Height, (in ft.)**
  - o The height of all types of plants surviving at the plot.
  - o Species wise frequency distribution tables were prepared and their average height was calculated.



## 1.18 Evaluation of Subsidiary Silvicultural Operations of Bamboo and timber

Along with the evaluation of plantation activities, at least one silvicultural operation site was considered for all the forest divisions covered in the study. However, in some of the forest divisions where intensity of SSO is felt higher by the evaluators, subjectively a greater number of sample sites were considered.

## 1.19 Evaluation of SMC Measures, Fire Protection Measures and Ama Jungle Yojana

During stakeholders' consultation it was understood that in majority cases, SMC structures were created either inside the plantation site or adjacent to plantation sites. So, all the SMC structures developed on sampled plantation sites were evaluated during the evaluation of plantation and silvicultural operations. The different SMC structures commonly considered under CAMPA is shown in the box given alongside. The SMC works undertaken beyond the plantation sites were also selectively considered.

- Staggered trench
- Moon shaped trench
- Stone filled moon shaped trench
- Cause-way
- Water Body

Similarly, the details of fire protection measures were assessed for all the plantation sites covered under the study. This is to note that Ama Jungle Yojana(AJY) is not implemented in all of the forest divisions. With respect to Berhampur forest circle, AJY is implemented at Phulbani, Paralakhemundi and Baliguda forest divisions only. One VSS supported under AJY was evaluated for each of the forest divisions of the said three divisions.

## 1.20 Evaluation of Wild Life Management

A Part of CAMPA funds are utilized for wild life management in all the forest divisions. After assessing the type of activities undertaken for wild life management, in the sampled-out forest ranges where plantation activities were evaluated, all types of activities for wild life management were also evaluated. Some of the important wild life management activities covered in the evaluation process included anti- poaching barracks, anti-poaching squads, animal rescue centres, watch towers, slat licks etc.





## 1.21 Infrastructure Development

Stakeholders' consultations organized at circle and division level indicated that a number of infrastructure activities including staff quarter for forester- cum- office, boundary walls and range offices were created with the utilisation of CAMPA funds. For the sampled-out ranges, all types of infrastructure development activities were evaluated. The parameters used for evaluating infrastructural facilities are as per the following table 1.14.

Table 1.14: Evaluation criteria for assessing infrastructural facilities created under CAMPA

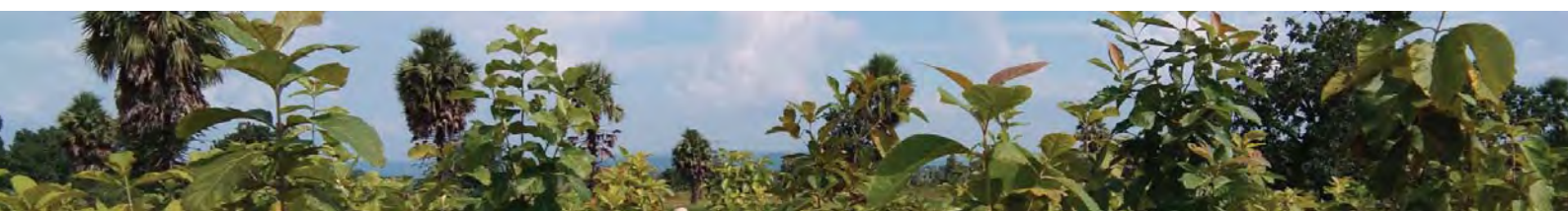
Sl. No	Type of Infrastructure	Evaluation Criteria
1	Buildings	No of buildings currently used
		No of buildings having water and electricity facility
		No of building with all-weather livability
2	Roads/ causeway/ Culverts/ Bridges	No of Roads/ causeway/ Culverts/ Bridges constructed
		No of Roads/ causeway/ Culverts/ Bridges handed over to Gram Panchayats
3	Water Bodies	No of habitations dependent/water body
		No of wild animals visiting the tank per day
		Percentage change in water-level in the wells of nearby community
		Average water level in the water body
4	Tube-wells	No of tube-wells functioning
5	Seizure/yard/ Malkhana	Size of malkhana (in Sq. meters) per range
		No of stolen cases from the malkhana registered per range per year
6	Anti- poaching barrack/ Watch tower	Usability, Present status, maintenance of register, effectiveness
7	Anti-poaching check gate	Usability, Present status, maintenance of register, effectiveness
8	Strengthening of crime cell, elephant cell at wildlife HQ	Usability, Present status, maintenance of register, effectiveness
9	Equipment	Usability, Present status, maintenance of register, effectiveness

## 1.21 Sacred Groves

As it is well known that sacred groves are mostly found inside forest areas as well as forest fringe villages. During the evaluation process, sacred groves wherever witnessed in the sampled-out forest rangers were evaluated.

## 1.22 Research and Capacity Development

Research and capacity development measures as well as promotion of IT activities were assessed for all the sampled-out ranges.



### 1.23 Statistical Instruments used for Data Collection

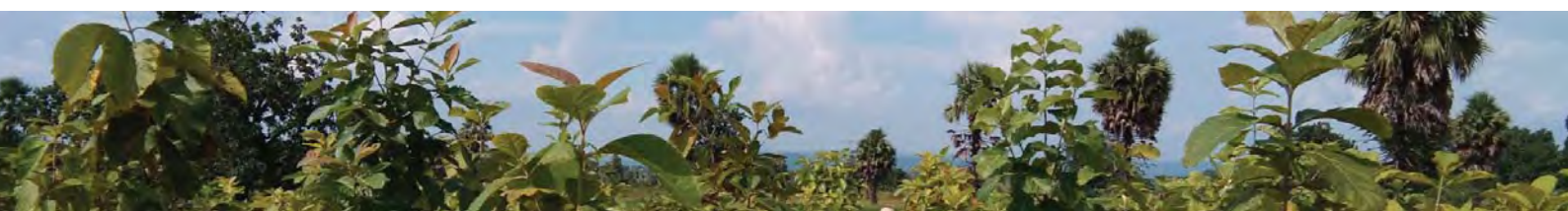
- Format for Evaluation of Plantation and SSO Activities
- Format for Evaluation of Non- Plantation Activities
- Site specific and Plot specific Plantation evaluation Format
- Format for Ama Jungle Yojana

### 1.24 Statistical Analysis

The statistical analysis for the ongoing evaluation study was aggregative as well as disaggregate in nature. The collected database was broadly classified under Plantation, ANR and SSO works, SMC works and Infrastructure activities. The collected information was quantitative as well as qualitative in nature. The quantitative data were processed by using software like SPSS and Excel. However, manual processing was also followed for analysing qualitative data. All the data were aggregated into circle wise analysis first and subsequently disaggregated into division wise analysis under respective circles.

### 1.25 Chapter Design

Sl.	Chapters	Caption
1		Contents
2		Abbreviations
3		Acknowledgement
4		Executive Summary
5	Chapter-1	Introduction
6	Chapter-2	Implementation and Output Performance of CAMPA during 2009-10 to 2016-17
8	Chapter-3	Evidence of CAMPA implementation in Angul Circle
9	Chapter-4	Evidence of CAMPA implementation in Baripada Circle
10	Chapter-5	Evidence of CAMPA implementation in Berhampur Circle
11	Chapter-6	Evidence of CAMPA implementation in Bhawanipatna Circle
12	Chapter-7	Evidence of CAMPA implementation in Bhubaneswar Circle
13	Chapter-8	Evidence of CAMPA implementation in Koraput Circle
14	Chapter- 9	Evidence of CAMPA implementation in Rourkela Circle
15	Chapter- 10	Evidence of CAMPA implementation in Sambalpur Circle
16	Chapter-11	Evidence of CAMPA Implementation in Nandankanan Zoo
17	Chapter-12	Way Forward







## CHAPTER - II







## 2. Implementation and Output performance of CAMPA during 2009-10 to 2016-17

Forest of Odisha is well stocked, diverse, multi-storied and dense in nature. Odisha is one of the pioneering States at the national level in implementing Joint Forest Management Programme which strengthen community participation in forest protection. Recorded Forest Area (RFA) in the State is 61,204 sq. km. of which 36,049 sq. km. is Reserved Forest (RF), 25,133 sq. km. is Protected Forest (PF) and 22 sq. km. is Unclassed Forests (UF). The state has raised 6,30,896 ha of plantations in the last two years. Two National Parks and 19 Wildlife Sanctuaries constitute the Protected Area network of the State covering 5.19% of its geographical area.

The forest cover in the State is 51,618.51 sq. km. which is 33.15 % of the State's geographical area. In terms of forest canopy density classes, the State has 6,969.71 sq. km. under Very Dense Forest (VDF), 21,551.93 sq. km. under Moderately Dense Forest (MDF) and 23,096.87 sq. km. under Open Forest (OF). Forest Cover in the State has increased by 273.51 sq. km. as compared to the 2017 ISFR assessment (Based on the interpretation of IRS Resources at-2 LISS III satellite data of the period November 2017 to February 2018).

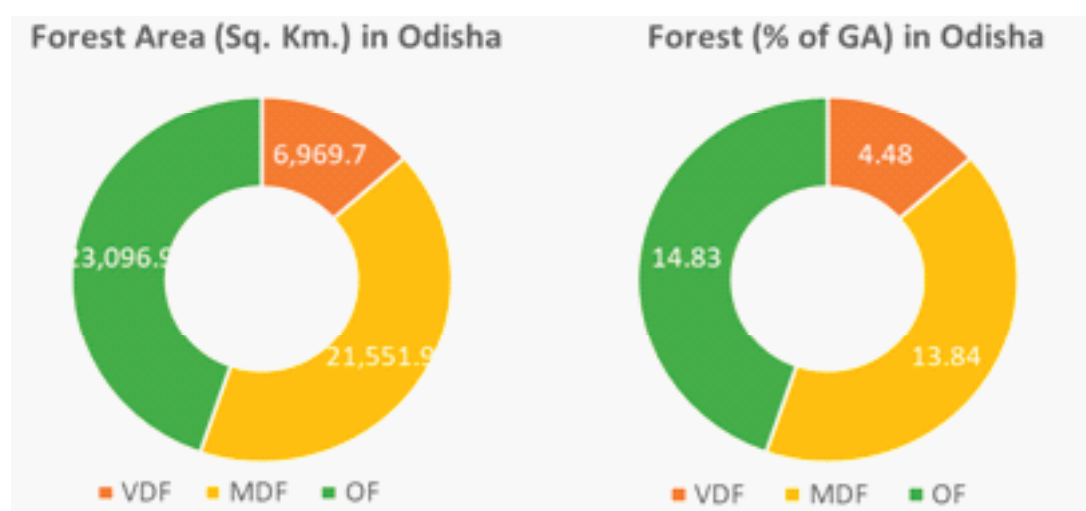


Figure 2.1: Forest in Odisha

The State has reported extent of recorded forest area (RFA) of 61,204 sq. km. which is 39.31% of its geographical area. The Reserved, Protected and Unclassed forests are 58.90 percent, 40.75 percent and 0.35 percent of the recorded forest area in the State respectively. However, the digitized boundary of recorded forest area from the state covers 42,430.50 sq. km.

Table 2.1: Forest Cover Inside & Outside Forest Area

Forest Cover inside the Recorded Forest Area (or Green Wash)				Forest Cover outside the Recorded Forest Area (or Green Wash)			
VDF	MDF	OF	Total	VDF	MDF	OF	Total
5,567	15,250	11,992	32,809	1,403	6,302	11,105	18,810
16.97%	46.48%	36.55%		7.46%	33.50%	59.04%	

Source: ISFR, 2019

As per the Champion & Seth classification (1968), forest cover percentage is highest (22.06 percent) in Moist Peninsular Low-Level Sal followed by Northern Dry Mixed Deciduous Forest (21.29 percent) and Dry



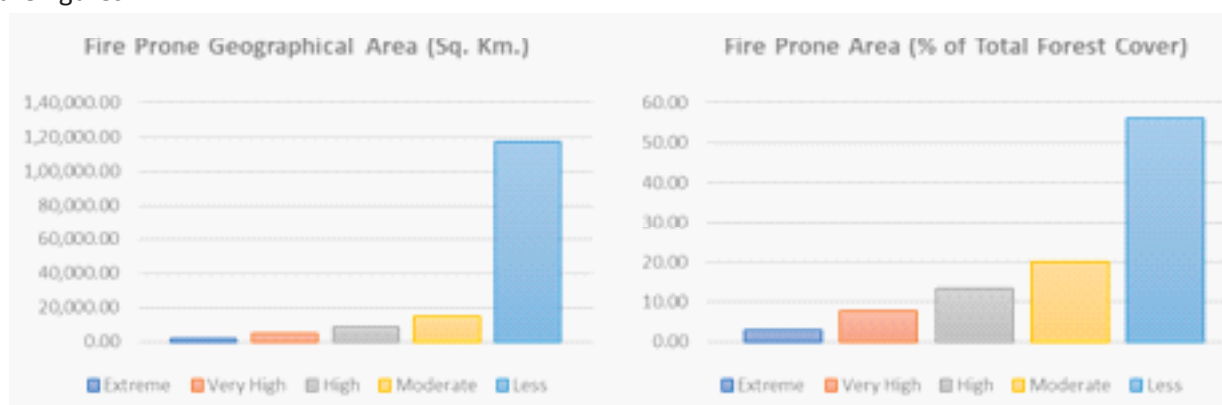
Peninsular Sal Forest (17.79 percent). Details are presented in the table 2.2.

*Table 2.2: Area Under Different Forest Types in Odisha (%)*

SN	Forest Type	% of Forest Cover
1	2B/C3 Orissa Semi-Evergreen Forest	0.14
2	2/2S1 Secondary Moist Bamboo Brakes	0.39
3	3B/C2 Southern Moist Mixed Deciduous Forest	2.26
4	3B/2S1 Southern Secondary Moist Mixed Deciduous Forest	0.75
5	3C/C1d Peninsular (Coastal) Sal Forest	0.01
6	3C/C2e (i) Moist Peninsular High-Level Sal	4.47
7	3C/C2e (ii) Moist Peninsular Low-Level Sal	22.06
8	3C/C2e (iii) Moist Peninsular Valley Sal	1.74
9	3C/2S1 Northern Secondary Moist Mixed Deciduous Forest	8.66
10	3C/DS1 Moist Sal Savannah	0.01
11	4A/L1 Littoral Forest	0.23
12	4B/TS2 Mangrove Forest	0.44
13	5A/C1b Dry Teak Forest	0.32
14	5A/C3 Southern Dry Mixed Deciduous Forest	10.51
15	5B/C1c Dry Peninsular Sal Forest	17.79
16	5B/C2 Northern Dry Mixed Deciduous Forest	21.29
17	5/DS1 Dry Deciduous Scrub	3.92
18	5/E9 Dry Bamboo Brake	1.63
19	5/E2 Boswellia Forest	0.06
20	Plantation/ TOF	3.32
	<b>Total</b>	<b>100.00</b>

Source: ISFR, 2019

Odisha forest is prone to fire indifferent degrees. About 23.87 percent area of the total forest area is extreme to high fire prone category. About 56.17 percent forest cover area is less fire prone and 19.96 percent area is moderately fire prone. Geographical area under different forest fire proneness are given in the figures.



*Figure 2.2: Fire Proneness of Forest Area in Odisha*

Source: ISFR, 2019





One of the objectives of the ongoing study is to evaluate the Annual Plan of Operations formulated and implemented by the forest department. Since 2009-10, APOs are formulated in every financial year and implemented in the subsequent year. The latest in the series is the CAMPA APO 2018-19 and this APO is being implemented currently. However, the evaluation study takes into account the APOs formulated from the year 2009-10 to 2016-17, a period spanning over 8 years. Present chapter evaluates the physical and financial progress of all the activities undertaken under CAMPA during the period 2009-10 to 2016-17. Before undertaking the evaluation of all the CAMPA activities, the initial section of this chapter provides a time series account of the funds received by state CAMPA from Adhoc CAMPA and amount of funds utilized. With this background and looking at the nomenclature of CAMPA activities as key and non-key activities, the chapter elucidates and evaluates all of the activities undertaken under CAMPA physically and financially. As the chapter is aimed at evaluating APOs, on the basis of secondary data regarding implementation of CAMPA activities at state level, the evaluation work is carried out by analysing the direction of implementation of different activities during the period 2009-10 to 2016-17.

## 2.1 Financial & Physical Progress under CAMPA

The physical activities under CAMPA funds broadly comprises conservation, protection, regeneration, and management of natural forests; conservation, protection and management of wild life and infrastructure development including promotion of research, training and other allied activities. The physical activities are undertaken by utilizing CAMPA funds that comprises money realized by the state CAMPA towards the NPV of the forest land diverted for non-forest purposes as per provisions of different Acts as outlined in the previous section. As per the provisions of CAMPA Act, Adhoc CAMPA. As per the provisions of CAMPA Act. Adhoc CAMPA with effect from the financial year 2014-15 onwards releases an annual amount to the state CAMPA which is equal to 10% of the principal amount lying to the credit of the state CAMPA. It is further stipulated that the principal amount lying with the Adhoc CAMPA shall not be released or transferred or utilized and the backlog of CA if any shall be tackled on priority basis for which adequate provision is to be made in the Annual Plan of Operations (APO) by the state CAMPA.<sup>6</sup> Till date, the state CAMPA, Odisha has formulated 8 annual plans of operation and the total funds received from the Adhoc CAMPA upto APO year 2015-16 stands at Rs. 2030.2 crores and the expenditure ending March 2016 stands at Rs.1628.2 crores which is 80.2% of the funds received. In percentage terms, state CAMPA, Odisha has received 80.2 percent of the financial outlay from Adhoc CAMPA and utilized 94.4 percent of the total amount of funds received during the period 2009-10 to 2015-16. More than 90 percent fund utilisation is itself a robust indicator for implementation of CAMPA programme in Odisha.

*Table 2.3: Trend of financial outlay, amount received from Adhoc CAMPA and expenditure incurred by state CAMPA*

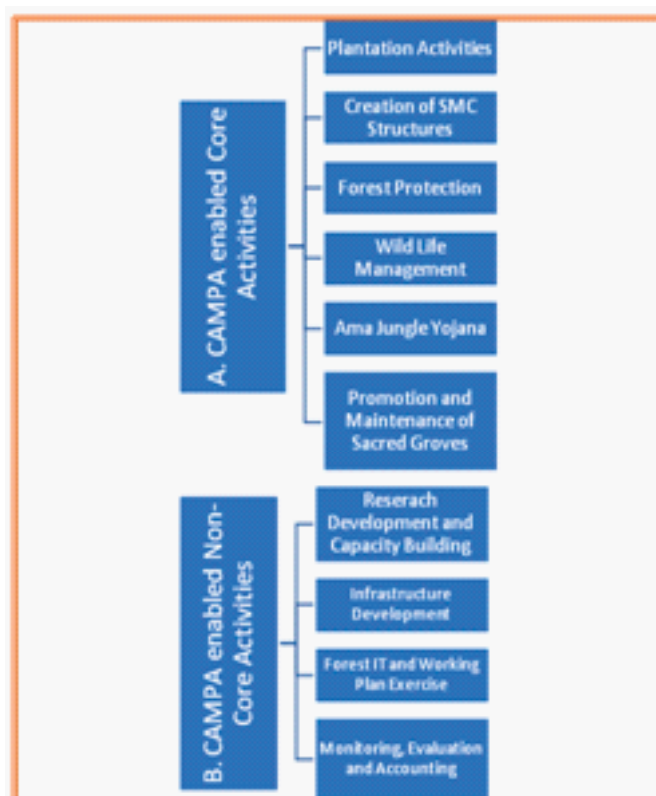
Sl. No	APO/ Addl. APO	Financial Outlay (Rs. In Crores)	Amount received from Adhoc CAMPA (Rs. In Crores)	Expenditure incurred (Rs. In Crores)	Amount received as % to financial outlay	Expenditure as % to the amount of funds received
1	2009-10	238.4	131.1	124.1	55.0	94.7
2	2010-11	140.2	140.2	88.7	100.0	63.3
3	2011-12	176.1	176.1	120.2	100.0	68.3
4	2012-13	265.3	205.8	171.9	77.6	83.5
5	2013-14	263.7	180.0	231.0	68.3	128.3

<sup>6</sup> Forest Department (2017-18): "Odisha State CAMPA: Annual Plan of Operations"



Sl. No	APO/ Addl. APO	Financial Outlay (Rs. In Crores)	Amount received from Adhoc CAMPA (Rs. In Crores)	Expenditure incurred (Rs. In Crores)	Amount received as % to financial outlay	Expenditure as % to the amount of funds received
6	2014-15	429.6	322.0	342.1	75.0	106.2
7	2015-16	516.9	473.0	459.5	91.5	97.2
	<b>Total</b>	<b>2030.2</b>	<b>1628.2</b>	<b>1537.5</b>	<b>80.2</b>	<b>94.4</b>

Source: Forest Department, Odisha State CAMPA Annual Plan of Operation, 2017-18



## 2.2 Activities undertaken under CAMPA

All the activities undertaken under CAMPA as per Annual Plan of Operations prepared by the Forest Department, Government of Odisha are classified under core and non-core activities. The core activities from CAMPA fund comprises Plantation Activities, creation of SMC measures, Forest Protection, Wildlife Management, Ama Jungle Yojana and Sacred Groves. Similarly, the non-core activities by utilizing CAMPA funds comprise of Research Development and Capacity Building; Infrastructure Development; Forest IT and Working Plan Exercise; Monitoring, Evaluation and Accounting. Following sections of the chapter provides progress details of CAMPA core and non-core activities in Odisha enabled by years and forest circles.

**Figure 2:3 – List Different type of activities undertaken under CAMPA**

## 2.3 Plantation:

Key plantation activities that have been taken up in the circles are block plantation, ANR with enrichment planting (gap plantation), bald hill plantation, bamboo plantation and CA PCA. Block plantation was taken up in 2009-10, covering a total area of 32,884 ha. ANR with gap plantation was implemented from 2014-15 to 2016-17. Bamboo plantation was taken up in the year 2014-15 in 20,594 ha. Plantation under CA PCA was implemented in two phases, i.e., from 2010-11 to 2012-13 and again 2014-15 to 2016-17. Similarly, bald hill plantation was implemented in the year 2011-12, 2012-13 and 2015-16. Year wise area coverage (in ha.) by plantation groups are presented in the table 2.4.



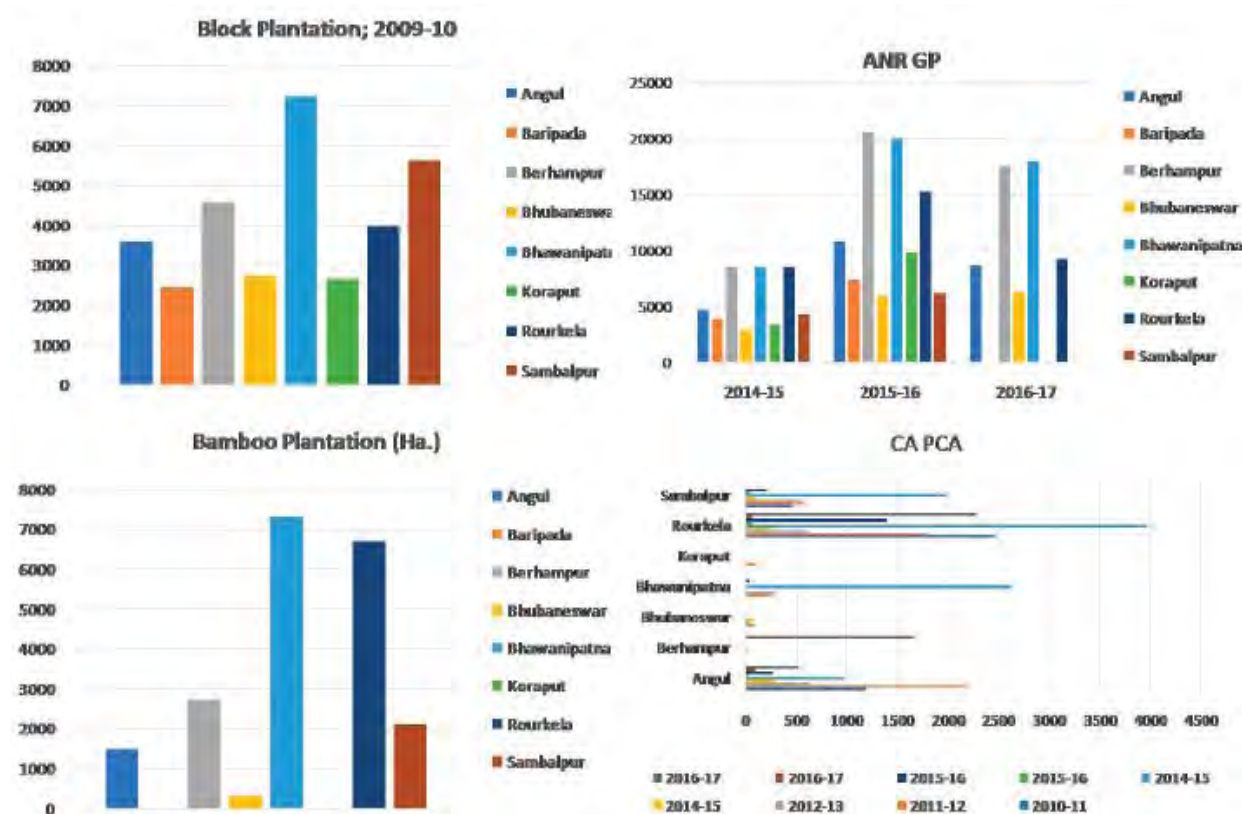


Table 2.4: Plantation Activities Taken up Under CAMPA (Area in Ha.)

Plantation	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Block Plantation	32884							
ANR GP						45040	96070	59830
Bamboo Plantation						20594		
CA PCA		4130	5006	2144		10302	2089	4655
Bald Hill Plantation			250.00	872.00			990	
<b>Total</b>	<b>32884</b>	<b>4130</b>	<b>5256</b>	<b>3016</b>		<b>75936</b>	<b>99149</b>	<b>64485</b>

Source: Forest & Environment Dept.

In block plantation (2009-10), of the total area covered (32, 884 ha.), major part of the area was in Kalahandi circle (22.0 percent) followed by Sambalpur (17.1 percent). Among all the circles, lowest area covered in Baripada circle (7.4 percent). Area covered under ANR with gap plantation in three years, i.e., 2014-15, 2015-16 and 2016-17 reflects fluctuating trend which may be due to coverage of area based on the requirement.



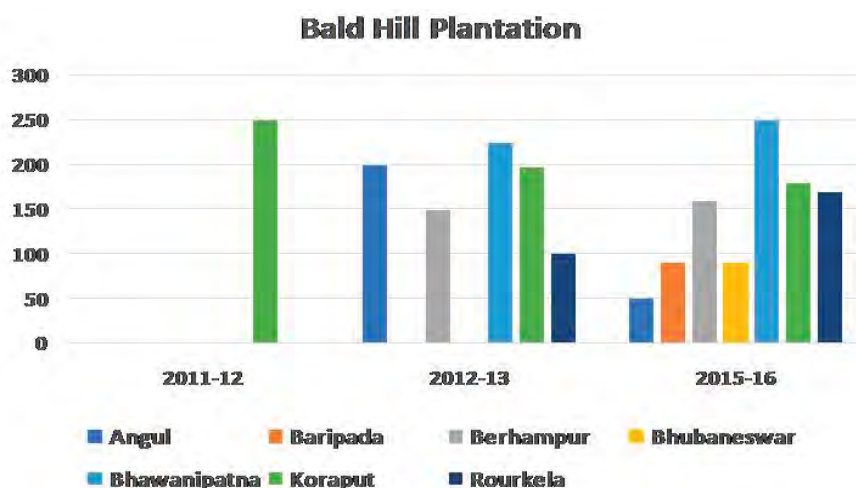


Figure 2:4: Plantation Activities  
Source: Forest & Environment Dept.

Year on Year (YOY) growth in area coverage under ANR with gap plantation shows a positive trend in all the forest circles in the year 2015-16 in comparison to 2014-15. However, coverage of area (in ha.) under ANR with gap plantation shows reduced in the year 2016-17 in all the circles, excluding Bhubaneswar. In three circles, i.e., Baripada, Koraput and Sambalpur, no ANR with gap plantation was implemented in the year 2016-17. Similarly, plantation under CA PCA reflects fluctuating trend over the plantation years across all the forest circles in the State. Overall, area covered under bald hill plantation reflects a positive area coverage trend during the period 2011-12 to 2012-13 and 2012-13 to 2015-16.

## 2.4 CRM and Silvicultural Operation:

Under CRM (Conservation, Regeneration and Management) and silvicultural operations, activities taken up are like SSO Bamboo, SSO-Timber, ANR without Gap plantation and management of old Teak plants. Apart from these, silvicultural operations / maintenance works were taken up for the area covered under plantation in different years, along with replacement for dead plants. ANR without gap plantation was implemented between the period 2009-10 to 2011-12 whereas SSO Bamboo was taken up in all the years from 2009-10 to 2016-17. SSO timber was implemented in the year 2013-14 and 2014-15. Area (ha.) covered under old teak management shows increasing between 2010-11 to 2012-13 which marginally reduced in the year 2013-14.

Table 2.5: Silvicultural Activities Taken up Under CAMPA (Area in Ha.)

Silviculture	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
ANR W GP	67932	40728	51274					
SSO Bamboo	19803	46235	43042	95700	100000	92755	126285	132420
SSO Timber					82034	87828		
Old Teak Management		986	1826	3492	3450			
Total	87735	87949	96141	99192	185484	180583	126285	132420

Area (ha.) covered under ANR without gap plantation during 2010-11 is about 40.0 percent less than that of 2009-10 which increased by 25.9 percent in the year 2011-12 in comparison to 2010-11. In SSO Bamboo, overall, there is a positive trend in terms of coverage of area under silvicultural operation in different





circles. Coverage of area under CRM and silvicultural operation under different categories are presented in the table and figure.

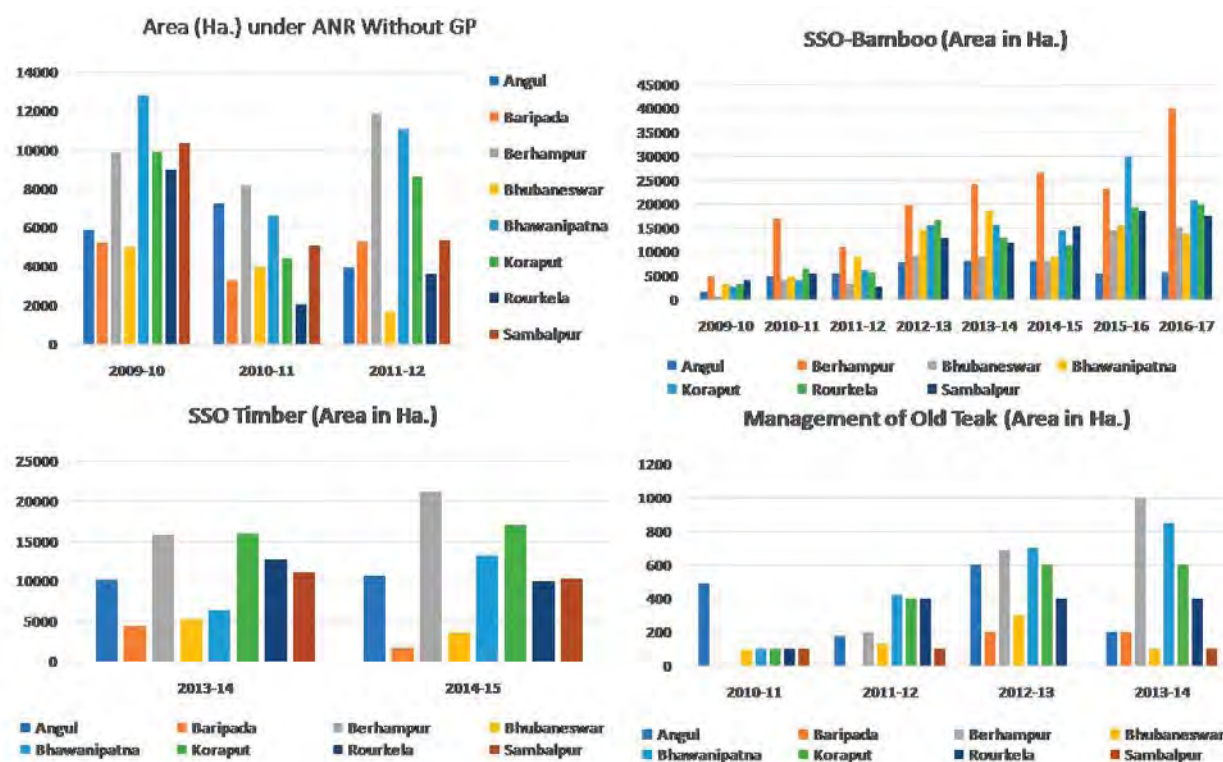
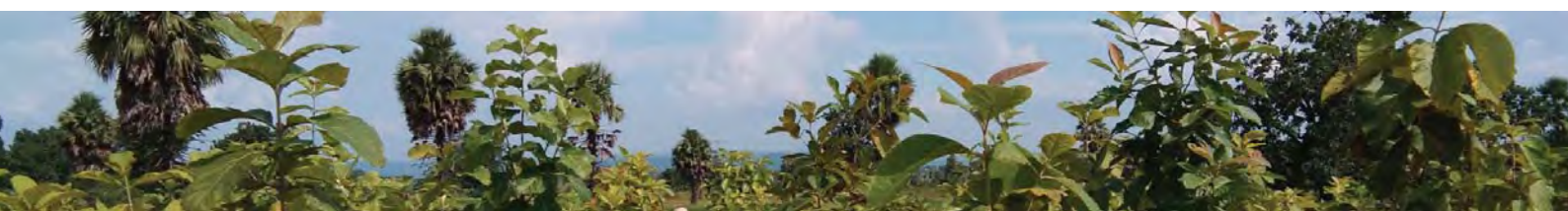
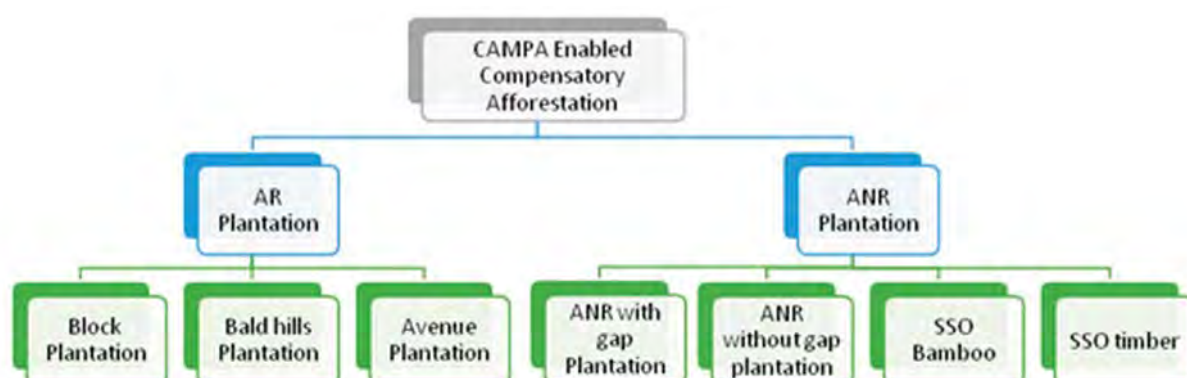


Figure 2.5: CRM & Silvicultural Operations

Source: Forest & Environment Dept.

## 2.5 Plantation Activities

Towards compensatory afforestation programme, Plantation activities constitute to be of foremost core activity. Under CA, AR as well as ANR type of plantations along with subsidiary silvicultural operations are equally focussed under CAMPA APOs. AR plantation comprises of block plantation, avenue plantation and bald hill plantations. Similarly, ANR plantation consists of ANR with gap, ANR without gap added with subsidiary silvicultural operations for bamboo and timber. The different types of plantations activities covered under CAMPA is as per the chart given ahead. Artificial Regeneration (AR) Plantations are mainly plantation in forests which are done through either afforestation or reforestation activities.



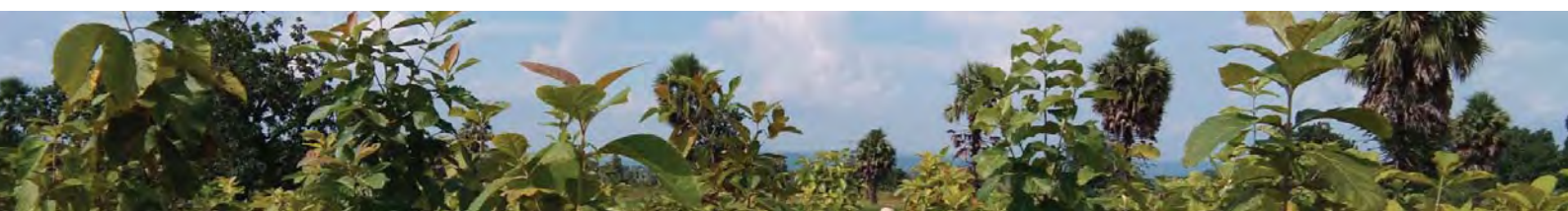
The main forms of benefits from AR plantations comprise of a range of benefits and services that include environmental protection or rehabilitation, recreational opportunities, carbon sequestration etc.<sup>7</sup> As per FAO definition, Re-establishment of forest through planting and/or deliberate seeding on land already in forest land use is called AR plantation.

On the other hand, Assisted Natural Regeneration (ANR) is a method for enhancing the establishment of secondary forest from degraded grassland and shrub vegetation by protecting and nurturing the mother trees and their wildlings inherently present in the area. ANR aims to accelerate, rather than replace, natural successional processes by removing or reducing barriers to natural forest regeneration such as soil degradation, competition with weedy species and recurring disturbances (e.g., fire, grazing, and wood harvesting). In addition to protection efforts, new trees are also planted when needed or wanted (enrichment planting). With ANR, forests grow faster than they would naturally.<sup>8</sup>



<sup>7</sup> Kenneth MacDicken Senior Forestry Officer/Team Leader Global Forest Resources Assessment Team FAO Forestry Department Viale delle Terme di Caracalla Rome 00153, Italy

<sup>8</sup> <http://www.fao.org/forestry/anr/en/>





### 2.5.1 Block Plantation

Tree plantations in compact blocks of more than 0.1 hectares on lands outside recorded forest area is called “Block Plantation”.<sup>9</sup> Block plantation outside recorded forest area is also termed as Outside Working Plan (OWP) plantation. Under CAMPA APOs, block plantations have been carried out in the completely degraded forest areas. As it can be seen from the following table about 45862 hectares of forest area have been covered under block plantation during the period 2009-10 to 2016-17 in all of the eight forest circles functioning in the state. Out of the total block plantation during the period 2009-10 to 2017-18, about 98 percent of block plantation has been done during the initial two years. Since 2011-12, the pace of plantation has been very slow as compared to all the subsequent years, there is less than 1 percent share in the overall block plantation area assessed for the study

period. Circle wise coverage of block plantation area indicates maximum coverage of block plantation is in Bhawanipatna circle followed by Sambalpur and Koraput circles.

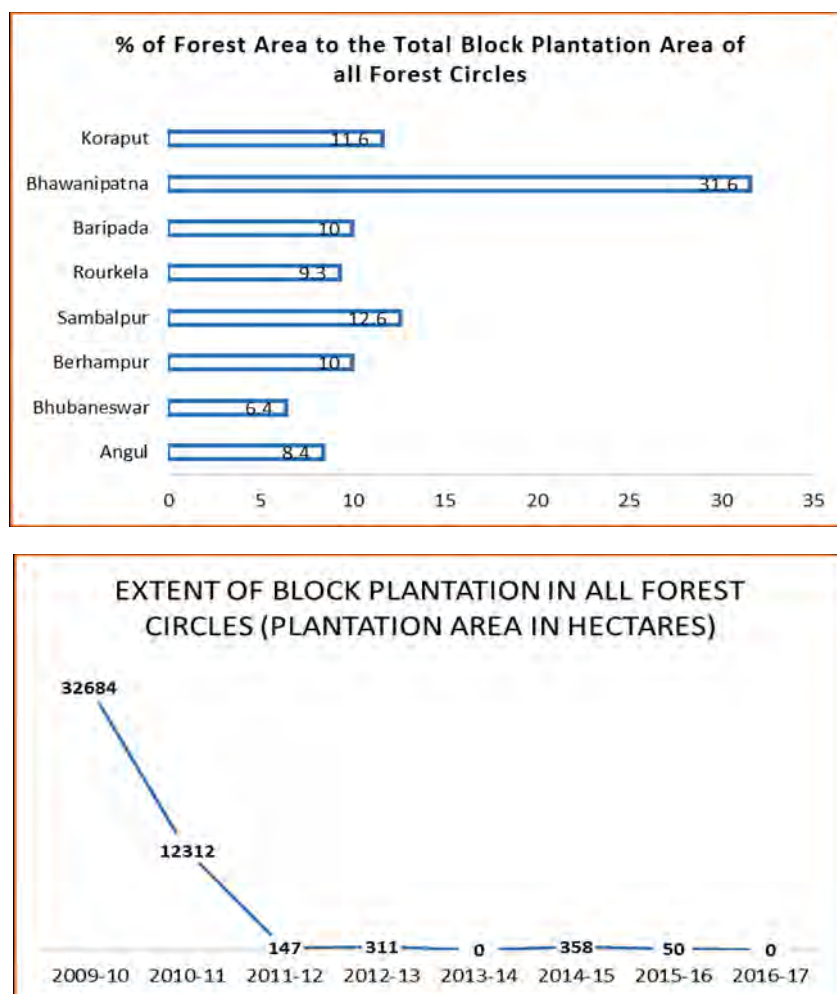
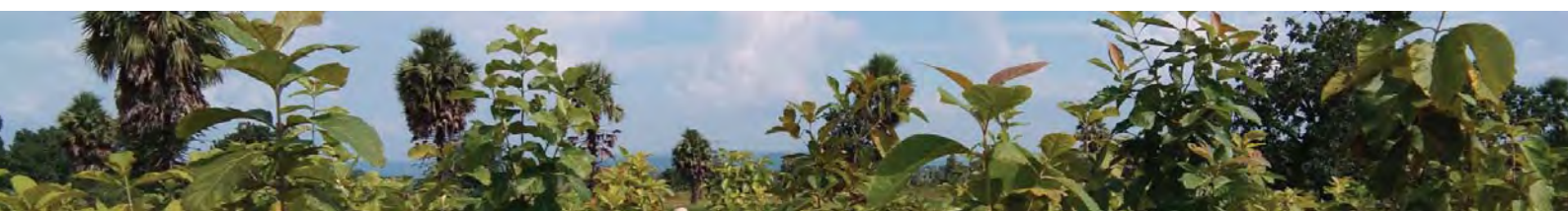


Figure 2.6 Distribution coverage of block plantation in all forest circle in Odisha.

Table 2.6: Block Plantation by Forest Circles (Forest Area in Hectares)

Years	Angul	Bhuba- neswar	Berhampur	Sambalpur	Rourkela	Baripada	Bhawa- nipatna	Koraput	All Circles	%
2009-10	3405	2926	4583	5636	3991	2245	7235	2662	32684	71.3
2010-11	200					2215	7235	2662	12312	26.8
2011-12						124	18	5	147	0.3
2012-13	200	17		40	40		7	7	311	0.7
2014-15				102	256				358	0.8
2015-16	50								50	0.1
Total	3855	2943	4583	5778	4287	4585	14495	5336	45862	100.0
%	8.4	6.4	10.0	12.6	9.3	10.0	31.6	11.6	100.0	

<sup>9</sup> India State of Forest Report (2009), “Glossary of Important Terms”.



## 2.5.2 Bald Hills Plantation

The State of Odisha is having scrub forests of 4,734 square kilometer, many of them are bald hills. Hence, the soil and moisture conservation measures and plantations are taken up after filling the pits with foreign soil. The scheme was started during 2009-10 by adopting special plantation techniques for restoration of green cover of bald hills in the districts of Cuttack, Jajpur, Ganjam, Koraput, Kalahandi, Khordha and Sundergarh,

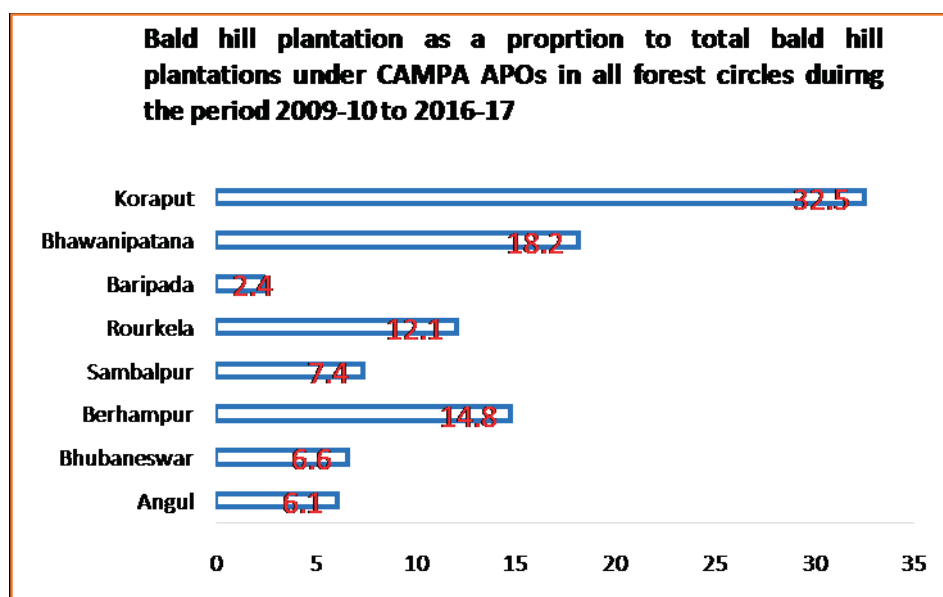


Figure 2:7 Bald Hill Plantation as a proportion to total Bald Hill Plantations under CAMPA APOs in all forest circles during 2009-10 to 2016-17

Mayurbhanj, Nuapada, Subarnapur, Bolangir, Rayagada, Parlakhemundi and Nayagarh.<sup>10</sup> As per table-2.7, it is observed that under CAMPA APOs, bald hill plantation programme was started from the year 2011-12 and about 2810 hectares of bald hill plantations have been completed by the end of 2016-17. Maximum proportion of bald hill plantation under CAMPA was done in the year 2016-17. Compared to other circles, maximum proportion of bald hill plantations are carried out in Koraput circle followed by Bhawanipatana and Berhampur circles.

Table 2.7: Bald Hills Plantation by forest circles (Forest Area in Hectares)

Years	Angul	Bhuba- neswar	Berha- mpur	Samba- lpur	Rourkela	Baripada	Bhawa- nipatana	Koraput	All Circles	%
2011-12			150	78	100			250	578	20.6
2012-13			150	45				197	392	14.0
2013-14									0	0.0
2014-15	50	90	160				50	180	530	18.9
2015-16		90		90	50	50		180	460	16.4
2016-17	100		75		150		350	175	850	30.2
Total	150	180	535	213	300	50	400	982	2810	100.0
%	6.1	6.6	14.8	7.4	12.1	2.4	18.2	32.5	100.0	

<sup>10</sup> <http://odishaforest.in/en/afforestation/>





### 2.5.3 Avenue Plantation

Avenue plantation is being implemented in the state to create a green belt along both sides of the State's National Highways, State Highways, District & Panchayat roads and urban roads for providing environmental services, shelters during summer and rains, reducing vehicular pollution, etc.<sup>11</sup> Under CAMPA APOs, avenue plantations have been undertaken in all the circles except Sambalpur circle. However, such component was carried out in all circles only in the initial year 2009-10. Subsequently, implementation of avenue plantation activity was discontinued in all the circles except Rourkela. In the year 2014-15, Rourkela circle had planted 7610 saplings under avenue plantation. About 98 percent of the overall avenue plantation activity in all the circles was done in the year 2009-10 and the remaining 2 percent was done in the year 2014-15. Except Sambalpur circle, avenue plantation was carried out in all of the forest circles.

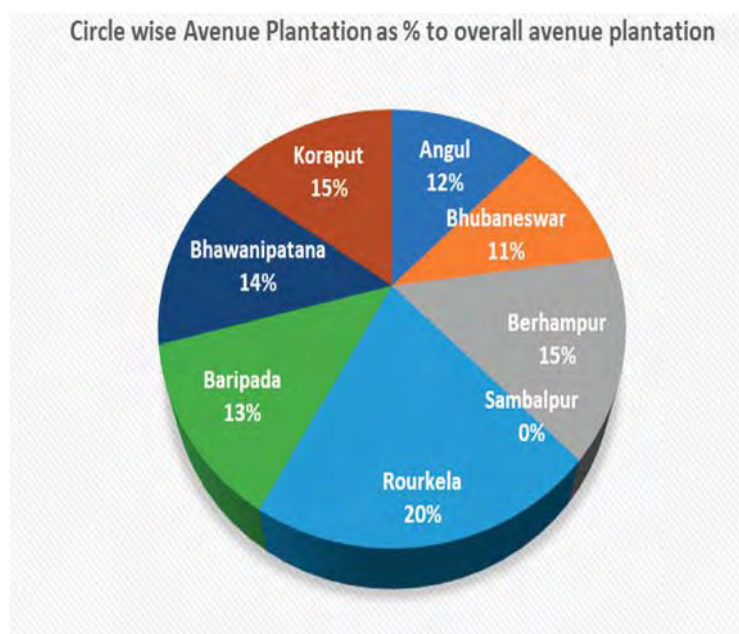


Figure 2:8 Circle wise Avenue Plantation as percentage to overall Avenue Plantation

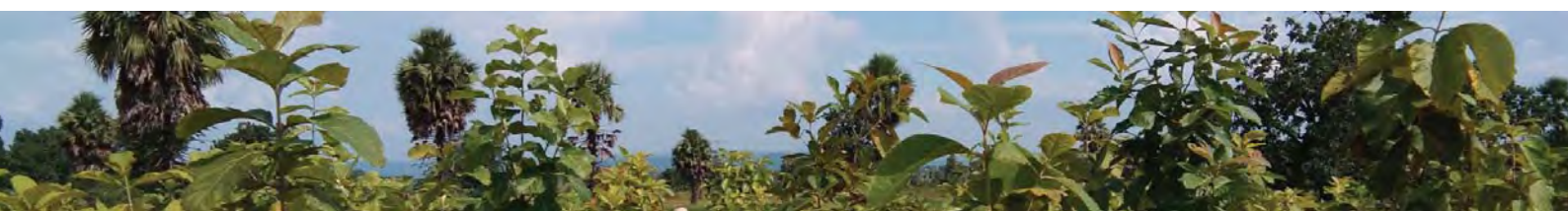
Table 2.8: Avenue Plantation under CAMPA APOs (No of saplings planted)

Year	No of saplings planted by circles									%
	Angul	Bhuba- neswar	Berha- mpur	Samb- alpur	Rourkela	Baripada	Bhawan- ipatana	Koraput	All Cicles	
2009-10	53000	45000	63917	0	80000	55000	61000	65000	422917	98.23
2014-15	0	0	0	0	7610	0	0	0	7610	1.77
All Years	53000	45000	63917	0	87610	55000	61000	65000	430527	100.00
%	12.3	10.5	14.8	0.0	20.3	12.8	14.2	15.1	100.0	

### Compensatory Afforestation

During the initial years of implementation of CAMPA APOs, compensatory afforestation had been undertaken under all forest circles. Overall, about 68.7 percent of compensatory afforestation was done in the year 2009-10, 29.2 percent in 2010-11 and further to 2.1 percent in the year 2011-12. The terminology of "Compensatory Afforestation" in this context refers to the unspent amount of fund of the previous APO used for plantation purposes in the current APO. This type of plantation was comparatively maximum under Rourkela circle followed by Angul and Sambalpur circles. It is further noticed that during the initial years of CAMPA APOs, compensatory afforestation was undertaken only for two years in all the circles.

<sup>11</sup><http://odishaforest.in/en/afforestation/>



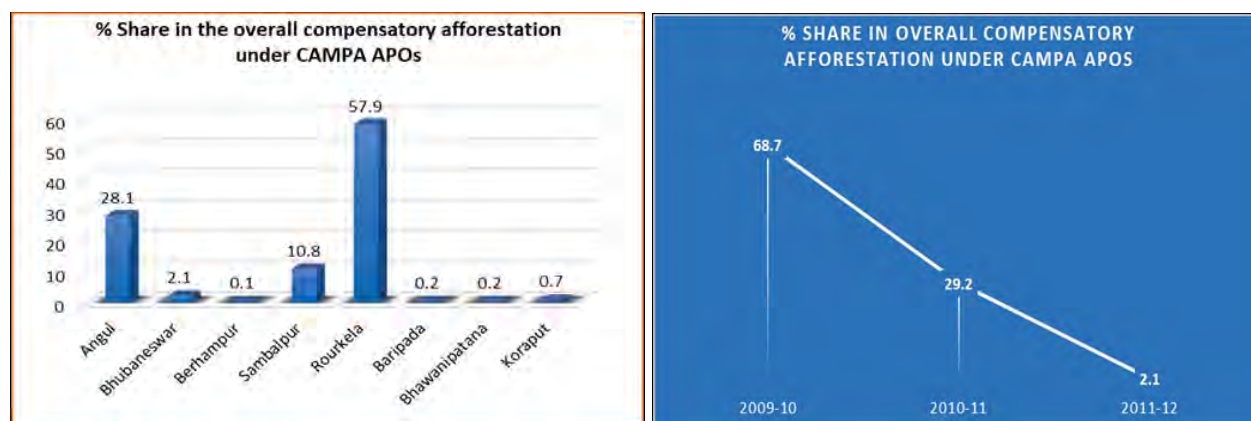


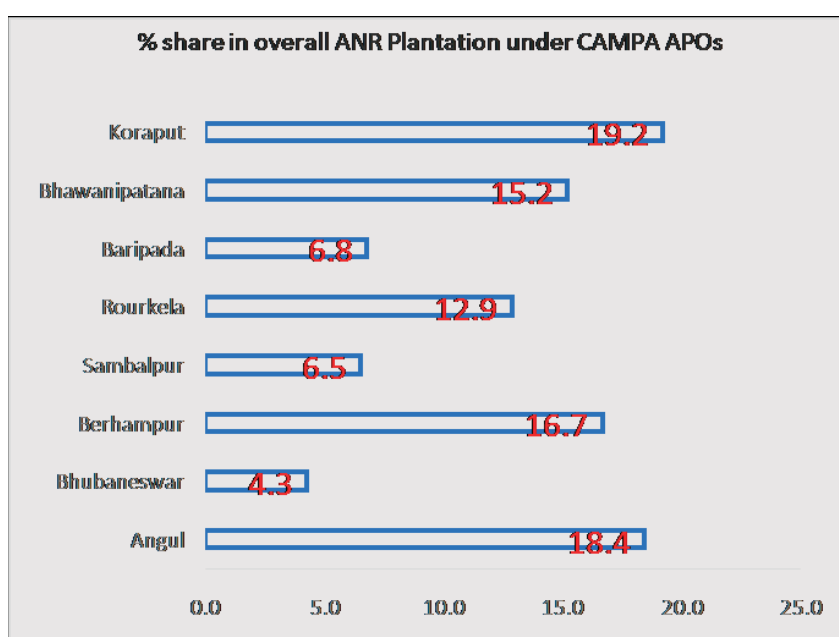
Figure 2.9 Percentage share in overall compensatory Afforestation under CAMPA APOs

Table 2.9: Compensatory Afforestation under CAMPA circles

Forest Circles	Year wise Compensatory Afforestation (Forest area in Hectares)				
	2009-10	2010-11	2011-12	All Years	%
Angul		1195		1195	28.1
Bhubaneswar		2	87	89	2.1
Berhampur			4	4	0.1
Sambalpur	459			459	10.8
Rourkela	2463			2463	57.9
Baripada		7		7	0.2
Bhawanipatana		7		7	0.2
Koraput		30		30	0.7
All Circles	2922	1241	91	4254	100.0
%	68.7	29.2	2.1	100.0	

#### 2.5.4. ANR (Creation)

Assisted Natural Regeneration (ANR) comprises of ANR with gap plantation and ANR without gap plantation. Year wise and circle wise, the total area covered under ANR plantation is furnished in table 2.10. The adjacent table clearly indicates that upto the year 2014-15, implementation of ANR activities was very limited to few circles only. Sambalpur, Baripada, Bhawanipatna and Koraput circles were the only circles those implemented





ANR activities. Implementation of ANR plantation was undertaken in all the circles in the year 2015-16 and in subsequent year, overall volume of implementation of ANR plantation increased. ANR plantation activities has shown a constant rising trend over years. There are more ANR plantation activities under Koraput, Angul, Berhampur and Bhawanipatna forest circles. These four circles jointly account for about 70 percent of the overall implementation of ANR plantation.

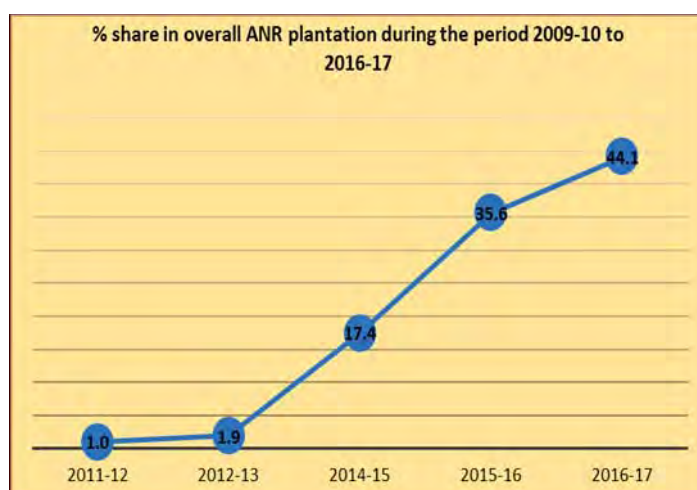


Figure 2:10 Percentage share in overall ANR Plantation under CAMPA in Odisha

Table 2.10: ANR Plantation under CAMPA APOs in all the forest Circles

Year	Angul	Bhuba- neswar	Berha- mpur	Samb- alpur	Rourkela	Baripada	Bhawan- ipatana	Koraput	All Circles	%
2011-12				500			855		1355	1.0
2012-13				500	500	1677			2677	1.9
2014-15	15231			1977	3976			3430	24614	17.4
2015-16	10800	6000	6000	6250	4400	4400	2625	9800	50275	35.6
2016-17			17520		9300	3500	18000	13900	62220	44.1
All Years	26031	6000	23520	9227	18176	9577	21480	27130	141141	100.0
%	18.4	4.3	16.7	6.5	12.9	6.8	15.2	19.2	100.0	

## 2.6 Financial Progress of Plantation Activities

The financial progress of each types of plantation activities during the period (2009-10 to 2016-17) under all forest circles is furnished in the following table 2.11. As it is revealed from the following table, a total amount of Rs.148365.0 lakhs (Rs.1483.65 crores) have been incurred for all the plantation activities during the period 2009-10 to 2016-17 and out of the total expenditure on

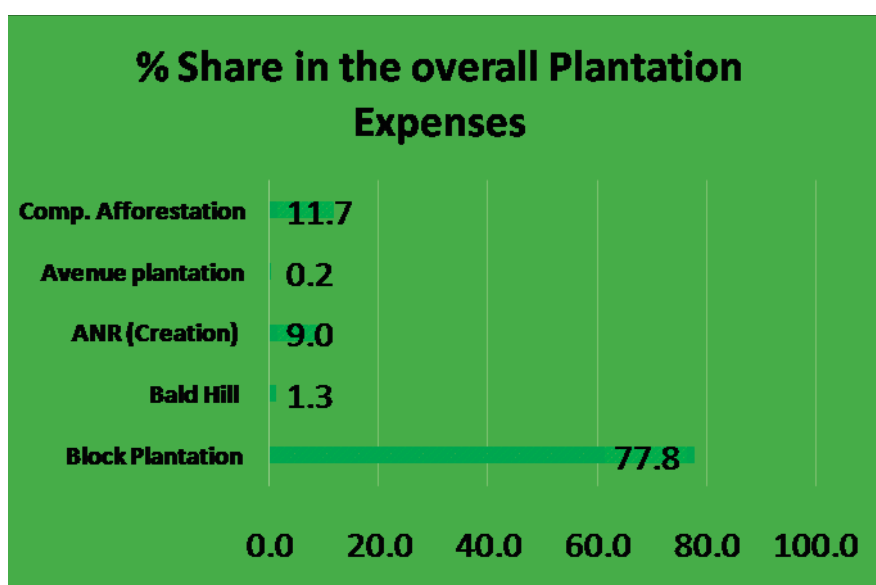
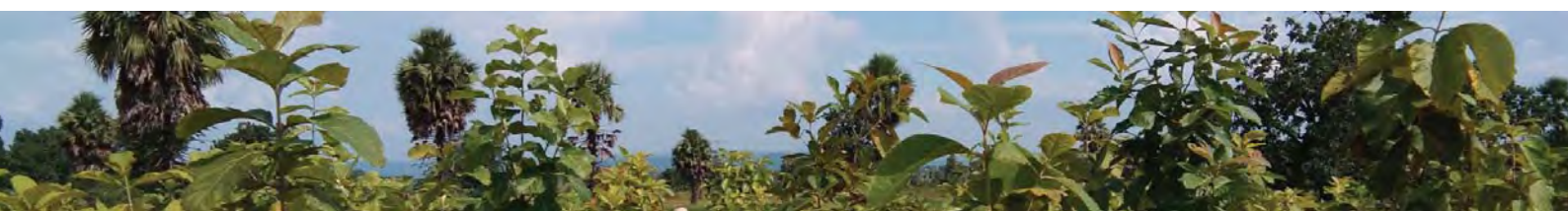


Figure 2:11 Percentage share in the overall plantation expenses under CAMPA



plantation, maximum proportion i.e. about 77.8 percent have been spent on block plantation. About 11.7 percent of the overall spending is on compensatory afforestation and 9.0 percent is on the creation of ANR activities. Expenses on bald hills plantation and avenue plantation as a percentage to the overall plantation expenditure stand at 1.3 and 0.2 percent respectively.

*Table 2.11: Financial Progress on Plantation activities (in lakh Rs.)*

Name of Circle	Year	Block Plantation	Bald Hill	ANR (Creation)	Avenue plantation	Comp. Afforestation	All Plantations
Angul	2009-10	682.0			1.9		683.9
	2010-11	123.2				279.8	403.0
	2011-12						0.0
	2012-13	107.7					107.7
	2013-14						0.0
	2014-15		41.0	2162.4			2203.4
	2015-16	32.3		1601.1			1633.4
	2016-17		78.5				78.5
	Sub Total	945.2	119.5	3763.5	1.9	279.8	5109.8
Bhubaneswar	2009-10	604.0			5.4		609.5
	2010-11					24.5	24.5
	2011-12					17.6	17.6
	2012-13	0.4					0.4
	2013-14						0.0
	2014-15		73.8				73.8
	2015-16		61.3	945.1			1006.3
	2016-17						0.0
	Sub Total	604.4	135.1	945.1	5.4	42.1	1732.0
Berhampur	2009-10	931.2			1.9		933.1
	2010-11	226.4				5.3	231.7
	2011-12		92.4				92.4
	2012-13		72.7				72.7
	2013-14						0.0
	2014-15		130.2				130.2
	2015-16			945.1			945.1
	2016-17		58.9	606.5			665.4
	Sub Total	1157.6	354.1	1551.6	1.9	5.3	3070.5





Name of Circle	Year	Block Plantation	Bald Hill	ANR (Creation)	Avenue plantation	Comp. Afforestation	All Plantations
<b>Sambalpur</b>	2009-10					45.4	45.4
	2010-11						0.0
	2011-12		13.8	18.6			32.4
	2012-13	2.7	16.5	36.1			55.3
	2013-14						0.0
	2014-15	14.8		272.5			287.2
	2015-16		61.3	924.7			986.0
	2016-17						0.0
	Sub Total		91.5	1252.0	0.0	45.4	
<b>Rourkela</b>	2009-10	801.6			269.1		1070.7
	2010-11					303.4	303.4
	2011-12		48.7				48.7
	2012-13	2.7		36.1			38.8
	2013-14						0.0
	2014-15	47.6		498.8	24.5		571.0
	2015-16		34.0	643.3			677.4
	2016-17		117.7	316.6			434.3
	Sub Total	852.0	200.4	1494.9	293.6	303.4	3144.3
<b>Baripada</b>	2009-10	411.2			2.8		414.0
	2010-11	116.5				14.1	130.6
	2011-12	11.7					11.7
	2012-13			44.9			44.9
	2013-14						0.0
	2014-15						0.0
	2015-16		34.0	643.3			677.4
	2016-17			117.0			117.0
	Sub Total	539.4	34.0	805.2	2.8	14.1	1395.5
<b>Bhawanipatna</b>	2009-10	1429.0			5.5	16503.2	17937.7
	2010-11	3.8				0.5	4.3
	2011-12	0.7		4.0			4.7
	2012-13	0.5					0.5
	2013-14						0.0
	2014-15		41.0				41.0
	2015-16			366.5			366.5
	2016-17		274.7	612.0			886.7
	Sub Total	1433.9	315.7	982.5	5.5	16503.7	19241.4



Name of Circle	Year	Block Plantation	Bald Hill	ANR (Creation)	Avenue plantation	Comp. Afforestation	All Plantations
Koraput	2009-10	561.3			2.4	7.3	571.0
	2010-11	131.9				8.9	140.8
	2011-12	0.5	153.5				154.0
	2012-13	0.5	74.1				74.6
	2013-14						0.0
	2014-15		146.8	519.8			666.6
	2015-16		121.6	1530.7		140.1	1792.4
	2016-17		132.7	474.9			607.6
	Sub Total	694.1	628.8	2525.4	2.4	156.4	4007.1
<b>All Circles Total</b>		<b>115502.0</b>	<b>1879.2</b>	<b>13320.1</b>	<b>313.6</b>	<b>17350.0</b>	<b>148365.0</b>
<b>%</b>		<b>77.8</b>	<b>1.3</b>	<b>9.0</b>	<b>0.2</b>	<b>11.7</b>	<b>100.0</b>

## 2.7 Silvicultural Operation

Silvicultural operations is one of the forest management plans with the objective of maximizing commercial value of trees in the forest. Such operations are conducted with different silvicultural techniques called intermediate and regeneration treatments. Intermediate treatments aim at the growth of the existing trees and regeneration treatments aim at natural or artificial regeneration of new trees. Broadly silvicultural operations include canopy alterations, alterations to induce natural regeneration, harvesting of mature trees, planting and thinning etc.<sup>12</sup> In addition to plantation activities, the implementation of CAMPA has also special focus for silvicultural operations. The details of silvicultural operations undertaken by all the circles during the period 2009-10 to 2016-17 is shown in the table-2.12. As it is noticed from the table, silvicultural operations were mainly undertaken by all the forest circles during the initial years of CAMPA implementation. The percentage share of the years 2009-10, 2010-11 and 2011-12 in the overall silvicultural operations stood at 39.5, 25.5 and 29.8 percent respectively. However, some additional silvicultural operations were undertaken in the years 2013-14 and 2014-15 in Bhubaneswar circle. Out of the

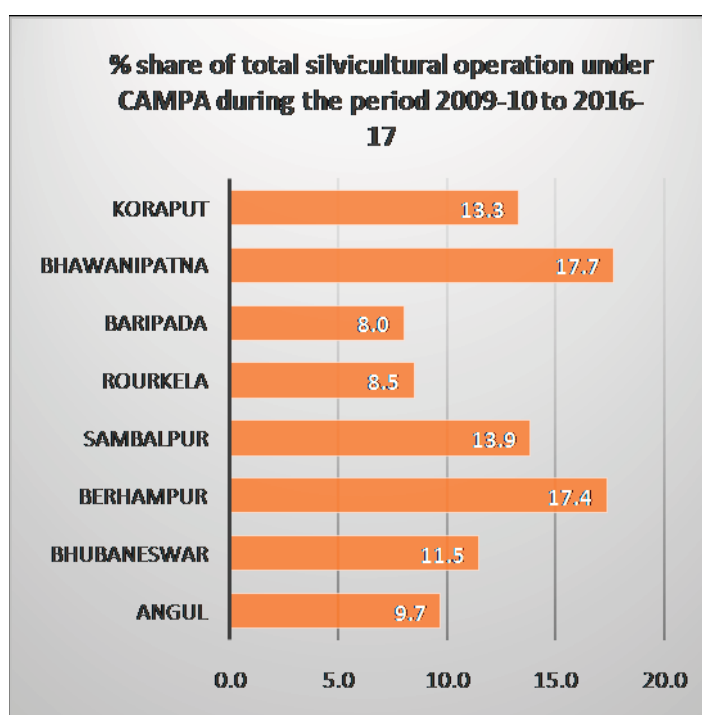
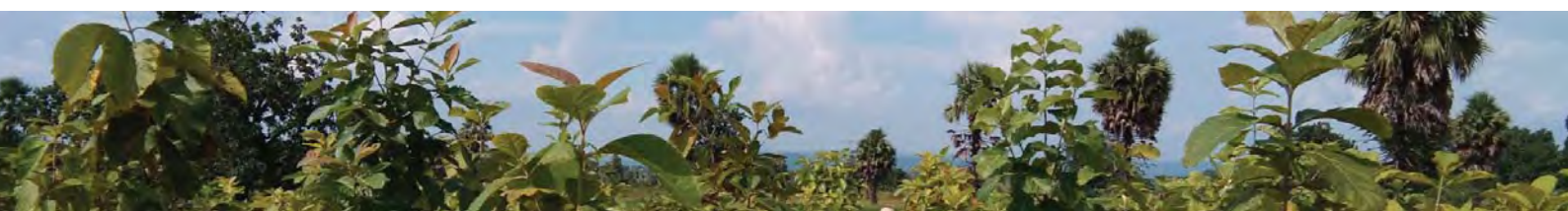


Figure 2:12 Percentage share in Silvicultural operation under CAMPA in Odisha during 2009-10 to 2016-17

<sup>12</sup>Hawley, Ralph C; Smith, David Martyn (1954). *The Practice of Silviculture* (6th ed.). New York: Wiley





overall silvicultural operations during the period 2009-10 to 2016-17, percentage share of Bhawanipatna, Berhampur and Koraput stood at 17.7%, 17.4% and 13.3 percent respectively.

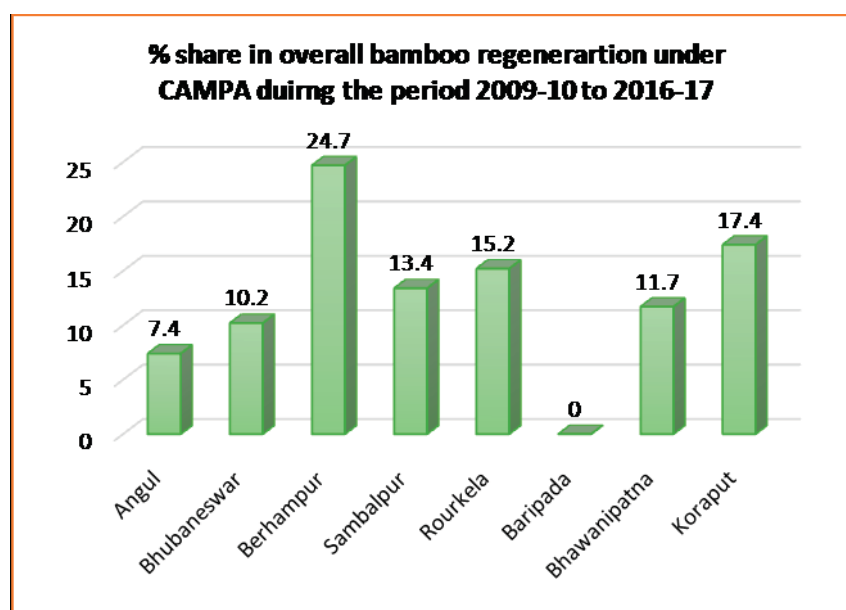
*Table 2.12: Silvicultural Operation under CAMPA (2009-10 to 2016-17)*

Year	Forest Area covered (in Hectares)									%
	Angul	Bhubaneswar	Berhampur	Sambalpur	Rourkela	Baripada	Bhawanipatna	Koraput	All Forest Circles	
2009-10	5561	5278	9832	10327	8990	5230	12809	9905	67932	39.5
2010-11	7195	3955	8188	8188	2050	3293	6600	4400	43869	25.5
2011-12	3921	1634	11852	5337	3599	5273	11060	8598	51274	29.8
2012-13									0	0.0
2013-14		5293							5293	3.1
2014-15		3620							3620	2.1
2015-16									0	0.0
2016-17									0	0.0
All Years	16677	19780	29872	23852	14639	13795	30469	22903	171988	100.0
%	9.7	11.5	17.4	13.9	8.5	8.0	17.7	13.3	100.0	

## 2.8 Regeneration of Bamboo

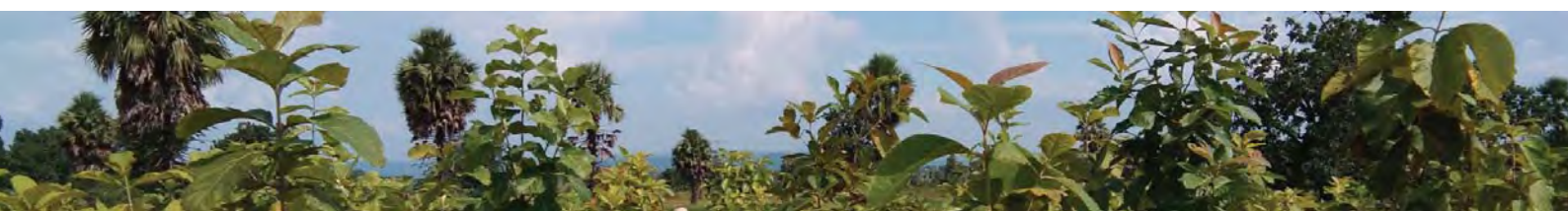
Bamboo is a natural regenerative plant which naturally grows in the forest as a bushy grass in tropical and subtropical ecology. The bamboo in forest areas of Odisha grows as mixed crop associated with Sal & other species. The mixed bamboo forest area is spread over about 17,795 Sq. Km. and pure bamboo forest (occurring mostly as bamboo brakes) is about 375 Sq.km. There are about 13 species of bamboo available in Odisha of which most commonly found are *Dendrocalamus strictus* (80%), and *Bambusa bamboos* (10%).<sup>13</sup> The basic principles of bamboo management centres

round the growth behaviours of the culm. New bamboo culms are produced every year from the buds of the rhizome of previous year culm. The rhizomes of more than two-year-old culms, therefore, have very little role to play in production of new culms. However, bamboo culms require about three years to be fully matured after which those are to be harvested. Retention of old culms will result in congestion of the



*Figure 2:13 Percentage share in overall bamboo regeneration under CAMPA in Odisha during 2009-10 to 2016-17*

<sup>13</sup><http://www.odishabamboo.org/>



clump. After 4-5 years the old culms will dry up, split and invite pests and disease, which will ultimately affect the younger culms. Congestion of clumps is one of the most serious problems in management of bamboo forests. Therefore, in India, for most of the bamboo forests, the prescribed cutting cycle is kept at 3 or 4 years. Regeneration of bamboo forests is basically managed under Culm Selection-cum-Clump Improvement and periodic silvicultural operations. Besides to conserve water near to the clumps, and prevent soil erosion SMC works like stone packing at the entire circumference of bamboo clumps are undertaken and then slurry packing is done. In the event of non-availability of stones, bamboo mats are alternatively used for stone packing. In the lower side half-moon trenches and contour bunding etc are done as SMC works.<sup>14</sup>

As it may be seen from the following table during the period 2009-10 to 2016-17, 627206.7 hectares of land have been treated for regeneration of bamboo. Bamboo regeneration is not reported for Baripada circle under CAMPA implementation. Maximum proportion of bamboo regeneration activity to the extent of 154975 hectares is undertaken in Berhampur circle compared to rest of the circles.

*Table 2.13: Regeneration of bamboo (Hectares of forest area)*

Year	Angul	Bhubaneswar	Berhampur	Sambalpur	Rourkela	Bhawanipatna	Koraput	All Forest Circles	%
2009-10	1302	860	4664	4028	3108	3242	2600	19803	3
2010-11	4775	4000	16793	16793	6500	4800	4000	57661	9
2011-12	5403	3424	200		5656	8950	6200	29833	5
2012-13	7650	9100	19703		16603		15393	68449	11
2013-14	8000	9000	24000	12000	13000	18400	15600	100000	16
2014-15	8044	8112	26500	15250	11350	9000	14500	92755	15
2015-16	5471	14405	23240	18478	19332	15500	29860	126285	20
2016-17	5623	15092	39875	17500	19862	13770	20698	132420	21
All Years	46267	63993	154975	84049	95410	73662	108851	627207	100
%	7	10	25	13	15	12	17	100	

In addition to regeneration of bamboo, Regeneration of FL bamboo has been carried out in three forest circles since the year 2011-12 and 2016-17 and same is not reported in other forest circles in any of the years over the study period 2009-10 to 2016-17. Out of the total regeneration of FL bamboo carried out under CAMPA intervention during the years 2011-12 and 2016-17, maximum proportion to the extent of about 63.3 percent is carried out in Angul circle followed by Bhubaneswar circle (20.4%) and Berhampur (16.3%).

*Table 2.14: Regeneration of FL bamboo under CAMPA implementation (Forest area in Hectares)*

Year	Angul	Bhubaneswar	Berhampur	Total
2011-12	1550	200	400	2150
2016-17		300		300
<b>Total</b>	<b>1550</b>	<b>500</b>	<b>400</b>	<b>2450</b>
%	63.3	20.4	16.3	100.0

<sup>14</sup> Discussion with forest officials and evaluators' observations.





## 2.9 Management of Old Teak Plantation

With respect to management of old teak plantation, Subsidiary Silvicultural Operations are carried out by utilizing CAMPA funds. About 9028 hectares of old teak plantation have been managed by all the forest circles under CAMPA implementation during the period 2010-11 to 2013-14. In subsequent years after 2013-14, management of old teak plantations have not received priority in CAMPA APOs. Out of the total intervention, maximum intervention was made in the year 2012-13 followed by 2013-14. Koraput circle followed by Berhampur and Angul circle accounts around 50 percent of the overall CAMPA supported management of old teak plantation.

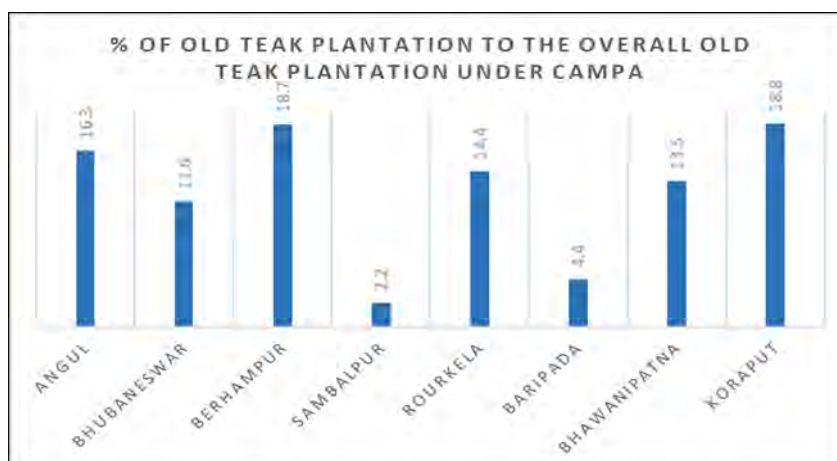


Figure 2:14 Percentage of Old Teak Plantation to the overall Old Teak Plantation under CAMPA

Table 2.15: Management of Old Teak Plantation (Forest Area in Hectares)

Year	Angul	Bhuban- eswar	Berha- mpur	Samba- lpur	Rourkela	Baripada	Bhawa- nipatna	Koraput	All Circles	%
2010-11	492	94			100		100	100	886	9.8
2011-12	177	130		100	398		421	400	1626	18.0
2012-13	600	300	691		401	200	700	600	3492	38.7
2013-14	200	524	1000	100	400	200		600	3024	33.5
All Years	1469	1048	1691	200	1299	400	1221	1700	9028	100
%	16.3	11.6	18.7	2.2	14.4	4.4	13.5	18.8	100.0	

## 2.10 Subsidiary Silvicultural Operation for Timber Species

In the assessment period, subsidiary silvicultural operations for timber under CAMPA intervention, was undertaken for two years 2013-14 and 2014-15 in all circles except Bhubnaeswar circle. Out of the total silvicultural operations for timber 47.7 percent of the overall activities were performed in the year 2013-14 and the remaining 52.3 percent were done in the year 2014-15. Inter circle variation as it is shown in table-2.16 reveals that maximum proportion of such activities to the extent of 23.0 percent were implemented in Berhampur circle followed by Koraput circle (20.4%), Rourkela Circle (15.8%) and Angul circle (13.0%).

Table 2.16: Subsidiary Silvicultural Operations for timber (forest area in Hectares)

Year	Angul	Bhuban- eswar	Berha- mpur	Samba- lpur	Rourkela	Baripada	Bhawan- ipatna	Koraput	All Circles	%
2013-14	10219		15870	11160	15369	1820	6414	15890	76742	47.7
2014-15	10746		21143	10348	10022	1747	13180	17022	84208	52.3
All Years	20965	0	37013	21508	25391	3567	19594	32912	160950	100.0
%	13.0	0.0	23.0	13.4	15.8	2.2	12.2	20.4	100.0	





## 2.11 Uprooting of Invasive weeds

Invasive weeds are not native species, sometimes also introduced species which has tendency to spread faster and cause damage to the forest environment thereby hindering proper growth of trees. Invasive compete so successfully against other plants that they can crowd out their competitors, thus producing a monoculture that discourages the growth of other plant species. These exotics (non-native plants) often specifically crowd out indigenous plants. Most commonly found weeds are lantern camera, sabia grass, pokasungha etc which hamper proper growth of valuable trees in the forest. As a part of overall SSO activity, uprooting of invasive weeds have been done under CAMPA implementation during the period 2009-10 to 2016-17. Uprooting of invasive weeds were done in the year 2009-10 in all the forest circles. After 2009-10, it has not been reported in any of the forest circles. As a percentage to the overall implementation of such activity, it is found maximum in Koraput district followed by Baripada, Rourkela and Berhampur circles. In all the forest circles, rooting out of invasive weeds has been undertaken in 15628.96 hectares of forest land.

*Table 2.17: Uprooting of Invasive weeds under CAMPA (Forest Area in Hectares)*

Districts	Uprooting of invasive weeds in the year 2009-10 (Forest Area in Hectares)	%
Angul	1090.5	7.0
Bhubaneswar	1386.1	8.9
Berhampur	1574.08	10.1
Sambalpur	1249.68	8.0
Rourkela	2004.2	12.8
Baripada	2991.9	19.1
Bhawanipatna	1416.5	9.1
Koraput	3916	25.1
All Circles	15628.96	100.0

## 2.12 Management of Economic Species

Under Management of Economic Species, generally SSO works are carried selectively for some of the economically important and naturally occurring species like Piasal and Rakta Chandan etc. Under CAMPA intervention during the period 2009-10 to 2016-17, Management of Economic Species is implemented only for two years 2010-11 and 2011-12. As it is seen from the following table, out of eight circles, six circles have implemented the programme in each of the year 2010-11 and 2011-12.





Table 2.18:- Management of Economic Species under CAMPA in 2010-11 and 2011-12 (Forest area in Hectares)

Forest Circles	Total Forest area implemented for Management of Economic Species under CAMPA		Total
	2010-11	2011-12	
Angul		340	340
Bhubaneswar	98	200	298
Berhampur	300	580	880
Sambalpur	300		300
Rourkela	100	200	300
Baripada			0
Bhawanipatna	200	300	500
Koraput	200	64	264

## 2.13 Financial Progress of Silvicultural and other Plantation management Activities

With respect to silvicultural operations and other plantation management activities, the financial progress as pointed out in the following table indicates that regeneration of bamboo is accorded top most priority as about 60.0 percent of the entire expenses on silvicultural operations and other ANR activities is spent on regeneration of bamboo plants. This is followed by general silvicultural operations and subsidiary silvicultural operations. These three activities jointly account around 96 percent of the overall expenses for silvicultural and other plantation management activities. The total expenses under this component stood at Rs.17677 lakhs (176.77 crores) during the period 2009-10 to 2016-17.

Table 2.19: Financial Progress of Silvicultural and other

Sl. No	Name of Circle	Year	Financial Progress (in Lakh Rs.)							
			Silviculture Operation	Regeneration of Bamboo	Reg Fl. Bamboo	Management of Teak	Subsidiary Silvicultural operation for Timber	Uprooting of invasive weeds	Management of Economic Species	All Activities
1	Angul	2009-10	99	11				5		115
		2010-11	129	42		19				191
		2011-12	87	67	40	6			13	213
		2012-13		109		40				150
		2013-14		120		13	204			338
		2014-15		157			201			358
		2015-16		104						104
		2016-17		108						108
	Sub Total		315	720	40	79	406	5	13	1577



Sl. No	Name of Circle	Year	Financial Progress (in Lakh Rs.)							
			Silviculture Operation	Regeneration of Bamboo	Reg Fl. Bamboo	Management of Teak	Subsidiary Silvicultural operation for Timber	Uprooting of invasive weeds	Management of Economic Species	All Activities
2	Bhubaneswar	2009-10	94	8				6		108
		2010-11	65	36		4			5	110
		2011-12	36	36	5	5			9	91
		2012-13		137		20				157
		2013-14	106	135		30				270
		2014-15	72	161						234
		2015-16		289						289
		2016-17		311	4					315
	Sub Total		373	1112	8	59	0	6	14	1574
3	Berhampur	2009-10	181	39				8		228
		2010-11	146	142					12	301
		2011-12	247	8	10				27	292
		2012-13		296		47				342
		2013-14		360		66	260			686
		2014-15		530			423			953
		2015-16		465						465
		2016-17		828						828
	Sub Total		574	2668	10	113	683	8	39	4095
4	Sambalpur	2009-10	170	34				5		210
		2010-11	146	142					12	301
		2011-12	99			4				103
		2012-13								0
		2013-14		180		7	223			410
		2014-15		305			206			511
		2015-16		370						370
		2016-17		340						340
	Sub Total		416	1371	0	11	429	5	12	2244
5	Rourkela	2009-10	156	28				9		194
		2010-11	37	58		4			5	104
		2011-12	65	59		16			9	149
		2012-13		249		27				276
		2013-14		195		26	307			529
		2014-15		227			200			427
		2015-16		387						387





Sl. No	Name of Circle	Year	Financial Progress (in Lakh Rs.)							
			Silviculture Operation	Regeneration of Bamboo	Reg Fl. Bamboo	Management of Teak	Subsidiary Silvicultural operation for Timber	Uprooting of invasive weeds	Management of Economic Species	All Activities
		2016-17		420						420
	Sub Total		258	1623	0	74	508	9	14	2486
6	Baripada	2009-10	93					14		107
		2010-11	59							59
		2011-12	96							96
		2012-13				13				13
		2013-14				13	36			50
		2014-15					35			35
		2015-16								0
		2016-17								0
	Sub Total		249	0	0	27	71	14	0	361
7	Bhawanipatna	2009-10	236	29				6		271
		2010-11	119	43		4			8	174
		2011-12	200	80		16			14	311
		2012-13				47				47
		2013-14		276			128			404
		2014-15		180			264			444
		2015-16		310						310
		2016-17		287						287
	Sub Total		555	1205	0	67	392	6	22	2247
8	Koraput	2009-10	168	18				18		203
		2010-11	79	35		4			10	129
		2011-12	157	56		16			4	233
		2012-13		225		40				265
		2013-14		234		40	318			591
		2014-15		290			340			630
		2015-16		597						597
		2016-17		444						444
	Sub Total		404	1898	0	100	658	18	14	3093
	Grand Total		3145	10599	58	529	3147	71	129	17677
	%		17.8	60.0	0.3	3.0	17.8	0.4	0.7	100.0



## 2.14 Second Year Maintenance of Plantation Activities

The physical progress of second year plantation as shown table-2.20 it is observed that for all types of plantation activities undertaken under CAMPA second year maintenance has been undertaken. Out of 2011838 hectares of second year maintenance of plantation activities, 72.2 are of Regeneration of Degraded Forest (RDF) plantation. About 16.6 percent are of block plantation and about 9.5 percent are of bamboo plantation.

*Table 2.20:- Physical Progress of Second Year Maintenance of Plantation Activities (Forest Area in Hectares)*

Name of Circle	Year	2nd year maintenance of Block Plantation	2nd year maintenance of Bald Hill Plantation	2nd year maintenance of RDF	2nd year maintenance of Avenue	2nd year bamboo plantation	All Plantations
		Area	Area	Area	Area	Area	Area
<b>Angul</b>	2009-10						0
	2010-11	3605					3605
	2011-12	462		718			1180
	2012-13	69		1774	30		1873
	2013-14		200				200
	2014-15						0
	2015-16			4740			4740
	2016-17	25		10800		1500	12325
	Sub Total	4161	200	18031	30	1500	23922
<b>Bhubaneswar</b>	2009-10						0
	2010-11	2726					2726
	2011-12						0
	2012-13	85					85
	2013-14						0
	2014-15						0
	2015-16			2950			2950
	2016-17	12	90	6000		300	6402
	Sub Total	2823	90	8950	0	300	12163
<b>Berhampur</b>	2009-10						0
	2010-11	4583					4583
	2011-12			4			4
	2012-13						0
	2013-14		150				150
	2014-15						0
	2015-16			8960		1200	10160
	2016-17		160	20600		308	21068





Name of Circle	Year	2nd year maintenance of Block Plantation	2nd year maintenance of Bald Hill Plantation	2nd year maintenance of RDF	2nd year maintenance of Avenue	2nd year bamboo plantation	All Plantations
		Area	Area	Area	Area	Area	Area
	Sub Total	4583	310	29564	0	1508	35965
Sambalpur	2009-10						0
	2010-11	4583					4583
	2011-12	415					415
	2012-13	117		998	687		1802
	2013-14		45				45
	2014-15						0
	2015-16			4470		2106	6576
	2016-17			6250			6250
	Sub Total	5116	45	11718	687	2106	19671
Rourkela	2009-10						0
	2010-11	3991					3991
	2011-12	255		1965			2220
	2012-13	117		998	687		1802
	2013-14		100				100
	2014-15						0
	2015-16			8560		3100	11660
	2016-17		170	12271		3580	16021
	Sub Total	4363	270	23794	687	6680	35794
Baripada	2009-10						0
	2010-11	2215					2215
	2011-12	255		1965			2220
	2012-13						0
	2013-14						0
	2014-15						0
	2015-16			2500			2500
	2016-17		90	7400			7490
	Sub Total	2471	90	11865	0	0	14426
Bhawanipatna	2009-10						0
	2010-11	7235					7235
	2011-12	13	85	4			101
	2012-13	50		200	15		265
	2013-14		225				225
	2014-15						0
	2015-16			8550		7100	15650



Name of Circle	Year	2nd year maintenance of Block Plantation	2nd year maintenance of Bald Hill Plantation	2nd year maintenance of RDF	2nd year maintenance of Avenue	2nd year bamboo plantation	All Plantations
		Area	Area	Area	Area	Area	Area
	2016-17		250	20000			20250
	Sub Total	7298	560	28754	15	7100	43726
Koraput	2009-10						0
	2010-11	2662					2662
	2011-12	18		12			30
	2012-13	5					5
	2013-14		213				213
	2014-15						0
	2015-16			3280		450	3730
	2016-17		180	9800		3000	12980
	Sub Total	2685	393	13092	0		16170
<b>Grand Total</b>		<b>33500</b>	<b>1958</b>	<b>145768</b>	<b>1419</b>	<b>19194</b>	<b>201838</b>
<b>%</b>		<b>16.6</b>	<b>1.0</b>	<b>72.2</b>	<b>0.7</b>	<b>9.5</b>	<b>100</b>

The financial progress as provided in table-2.21 indicates that out of the total 9800 lakhs of total expenditure incurred on second year maintenance of plantation activities about 64.2 percent were utilized for RDF type of plantation activities. About 17.6 percent were spent on block plantation and about 5.1 percent were spent on raising bald hills plantations.

*Table 2.21: Financial Progress of second year maintenance of plantation activities (Expenditure in Rs. Lakhs)*

Name of Circle	Year	2nd year maintenance of Block Plantation	2nd year maintenance of Bald Hill Plantation	2nd year maintenance of RDF	2nd year maintenance of Avenue	2nd year bamboo plantation	Total
		Expenditure	Expenditure	Expenditure	Expenditure	Expenditure	Area
Angul	2009-10						0
	2010-11	189					189
	2011-12	27		8			35
	2012-13	5		55	3		63
	2013-14		45				45
	2014-15						0
	2015-16			237			237
	2016-17	6		539		16	561
	Sub Total	227	45	839	3	16	1130





Name of Circle	Year	2nd year maintenance of Block Plantation	2nd year maintenance of Bald Hill Plantation	2nd year maintenance of RDF	2nd year maintenance of Avenue	2nd year bamboo plantation	Total
		Expenditure	Expenditure	Expenditure	Expenditure	Expenditure	Area
Bhubaneswar	2009-10						0
	2010-11	149					149
	2011-12						0
	2012-13	13					13
	2013-14						0
	2014-15						0
	2015-16			158			158
	2016-17	2	27	325		4	358
	Sub Total	164	27	483	0	4	678
Berhampur	2009-10						0
	2010-11	226					226
	2011-12			0			0
	2012-13						0
	2013-14		34				34
	2014-15						0
	2015-16			444		11	455
	2016-17		43	1076		4	1123
	Sub Total	226	77	1520	0	15	1838
Sambalpur	2009-10						0
	2010-11	226					226
	2011-12	2					2
	2012-13	10		37	17		64
	2013-14		10				10
	2014-15						0
	2015-16			226		24	250
	2016-17			314			314
	Sub Total	238	10	577	17	24	866
Rourkela	2009-10						0
	2010-11	204					204
	2011-12	11		20			31
	2012-13	10		37	17		64
	2013-14		22				22
	2014-15						0
	2015-16			423		36	459
	2016-17		49	641		42	732



Name of Circle	Year	2nd year maintenance of Block Plantation	2nd year maintenance of Bald Hill Plantation	2nd year maintenance of RDF	2nd year maintenance of Avenue	2nd year bamboo plantation	Total
		Expenditure	Expenditure	Expenditure	Expenditure	Expenditure	Area
	Sub Total	225	71	1121	17	78	1512
Baripada	2009-10						0
	2010-11	116					116
	2011-12	11		20			31
	2012-13						0
	2013-14						0
	2014-15						0
	2015-16			125			125
	2016-17		24	377			401
	Sub Total	127	24	522	0	0	673
Bhawanipatna	2009-10						0
	2010-11	378					378
	2011-12	1	24	0			25
	2012-13	4		7	18		29
	2013-14		50				50
	2014-15						0
	2015-16			432		73	505
	2016-17		71	1058			1129
	Sub Total	383	145	1497	18	73	2116
Koraput	2009-10						0
	2010-11	132					132
	2011-12	1		0			1
	2012-13	0					0
	2013-14		48				48
	2014-15						0
	2015-16			182		5	187
	2016-17		53	528		38	619
	Sub Total	133	101	710	0	43	987
Grand Total		1723	500	7269	55	253	9800
%		17.6	5.1	74.2	0.6	2.6	100.0





## 2.15 Third- and Fourth-Year Maintenance

After second year maintenance, second- and third-year maintenance were also done for different plantation activities covered under AR type of plantations were undertaken under CAMPA APOs. The physical progress of 3rd and 4th year maintenance as shown in table-2.22 indicates that total 87728 hectares of land have been undertaken for 3rd and 4th year maintenance. Out of the total physical progress of CAMPA with respect to 3rd and 4th year maintenance, proportionately highest coverage is noticed for RDF plantation and lowest coverage is for block plantation.

*Table 2.22: Physical Progress of 3rd and 4th year maintenance of Plantation Activities (Forest Area in Hectares)*

Name of Circle	Year	3rd year maintenance of Block Plantation	3rd year maintenance of Bald Hill Plantation	3rd year maintenance of RDF	3rd year maintenance of Avenue	3rd year bamboo Plantation	4th year maintenance of Bald Hill Plantation	4th year maintenance of Block Plantation	All Plantations
Angul	2009-10								0
	2010-11								0
	2011-12	384		535					919
	2012-13	431	200	706	30				1367
	2013-14								0
	2014-15								0
	2015-16						200		200
	2016-17	375		4740					5115
	Sub Total	1190	200	5981	30	0	200	0	7601
Bhubaneswar	2009-10								0
	2010-11								0
	2011-12								0
	2012-13								0
	2013-14								0
	2014-15								0
	2015-16								0
	2016-17	200	78	2950					3228
	Sub Total	200	78	2950	0	0	0	0	3228
Berhampur	2009-10								0
	2010-11								0
	2011-12	132							132
	2012-13				4				4
	2013-14								0
	2014-15		150						150
	2015-16						150		150
	2016-17	705		8560		1200			10465
	Sub Total	837	150	8560	4	1200	150	0	10901



Name of Circle	Year	3rd year maintenance of Block Plantation	3rd year maintenance of Bald Hill Plantation	3rd year maintenance of RDF	3rd year maintenance of Avenue	3rd year bamboo Plantation	4th year maintenance of Bald Hill Plantation	4th year maintenance of Block Plantation	All Plantations
Sambalpur	2009-10								0
	2010-11								0
	2011-12	5636							5636
	2012-13	255		1760	435				2450
	2013-14								0
	2014-15		45						45
	2015-16						20		20
	2016-17	490	38		4350	2106			6984
	Sub Total	6381	83	1760	4785	2106	20	0	15135
Rourkela	2009-10								0
	2010-11								0
	2011-12	3991							3991
	2012-13	255		1760	435				2450
	2013-14								0
	2014-15		100						100
	2015-16						100		100
	2016-17	350		7160		3100			10610
	Sub Total	4596	100	8920	435	3100	100	0	17251
Baripada	2009-10								0
	2010-11								0
	2011-12	323		1848					2171
	2012-13	7							7
	2013-14								0
	2014-15								0
	2015-16								0
	2016-17	320		3900					4220
	Sub Total	650	0	5748	0	0	0	0	6398
Bhawanipatna	2009-10								0
	2010-11		18						18
	2011-12			10					10
	2012-13	3			15				18
	2013-14								0
	2014-15		225						225
	2015-16			3900			225		4125
	2016-17	1505		8550		7100			17155
	Sub Total	1508	243	12460	15	7100	225	0	21551





Name of Circle	Year	3rd year maintenance of Block Plantation	3rd year maintenance of Bald Hill Plantation	3rd year maintenance of RDF	3rd year maintenance of Avenue	3rd year bamboo Plantation	4th year maintenance of Bald Hill Plantation	4th year maintenance of Block Plantation	All Plantations
Koraput	2009-10								0
	2010-11								0
	2011-12	35		23					58
	2012-13	30							30
	2013-14								0
	2014-15		197						197
	2015-16							213	213
	2016-17	1285		3430		450			5165
	Sub Total	1350	197	3453	0	450	0	213	5663
<b>Grand Total</b>		16712	1051	49832	5269	13956	695	213	87728
<b>%</b>		19.0	1.2	56.8	6.0	15.9	0.8	0.2	100.0

The financial progress of 3rd and 4th year maintenance as mentioned in table-2.23 indicates that a total amount of Rs.254.8 lakhs have been utilized towards the 3rd and 4th year maintenance of plantation activities. Comparatively more amount is spent for block and RDF plantation.

Table 2.23: Financial Progress of 3rd and 4th Year maintenance (Amount in Rs. Lakhs)

Name of Circle	Year	3rd year maintenance of Block Plantation	3rd year maintenance of Bald Hill Plantation	3rd year maintenance of RDF	3rd year maintenance of Avenue	3rd year bamboo Plantation	4th year maintenance of Bald Hill Plantation	4th year maintenance of Block Plantation	All Plantations
Angul	2009-10								0
	2010-11								0
	2011-12	14.9		2.5					17.4
	2012-13	25.9	38	11.6	2				77.5
	2013-14								0
	2014-15								0
	2015-16						24.1		24.1
	2016-17	34.5		95.6					130.1
	Sub Total	75.3	38	109.7	2	0	24.1	0	249.1
Bhubaneswar	2009-10								0
	2010-11								0
	2011-12								0
	2012-13								0
	2013-14								0
	2014-15								0
	2015-16								0
	2016-17	16.6	6.4	65.9					88.9
	Sub Total	16.6	6.4	65.9	0	0	0	0	88.9



Name of Circle	Year	3rd year maintenance of Block Plantation	3rd year maintenance of Bald Hill Plantation	3rd year maintenance of RDF	3rd year maintenance of Avenue	3rd year bamboo Plantation	4th year maintenance of Bald Hill Plantation	4th year maintenance of Block Plantation	All Plantations
Berhampur	2009-10								0
	2010-11								0
	2011-12	2.6							2.6
	2012-13				0				0
	2013-14								0
	2014-15		29.7						29.7
	2015-16						20		20
	2016-17	55.4		181.4		0.5			237.3
	Sub Total	58	29.7	181.4	0	0.5	20	0	289.6
Sambalpur	2009-10								0
	2010-11								0
	2011-12	169.3							169.3
	2012-13	15.9		27	7.2				50.1
	2013-14								0
	2014-15		8.8						8.8
	2015-16						2.7		2.7
	2016-17	4.2			86.9	11.1			102.2
	Sub Total	189.4	8.8	27	94.1	11.1	2.7	0	333.1
Rourkela	2009-10								0
	2010-11								0
	2011-12	156.8							156.8
	2012-13	15.9		27	7.2				50.1
	2013-14								0
	2014-15		13.9						13.9
	2015-16						11.2		11.2
	2016-17	29.1		152.9		15.7			197.7
	Sub Total	201.8	13.9	179.9	7.2	15.7	11.2	0	429.7
Baripada	2009-10								0
	2010-11								0
	2011-12	8.9		8.5					17.4
	2012-13	0.5							0.5
	2013-14								0
	2014-15								0
	2015-16								0
	2016-17	25.7		83.6					109.3
	Sub Total	35.1	0	92.1	0	0	0	0	127.2





Name of Circle	Year	3rd year maintenance of Block Plantation	3rd year maintenance of Bald Hill Plantation	3rd year maintenance of RDF	3rd year maintenance of Avenue	3rd year bamboo Plantation	4th year maintenance of Bald Hill Plantation	4th year maintenance of Block Plantation	All Plantations
Bhawanipatna	2009-10								0
	2010-11		0.7						0.7
	2011-12			0.2					0.2
	2012-13	0.1			7.7				7.8
	2013-14								0
	2014-15		44.5						44.5
	2015-16			83.6			29.3		112.9
	2016-17	121.3		187.3		35.8			344.4
	Sub Total	121.4	45.2	271.1	7.7	35.8	29.3	0	510.5
Koraput	2009-10								0
	2010-11								0
	2011-12	1.6		0.1					1.7
	2012-13	1.3							1.3
	2013-14								0
	2014-15		39.1						39.1
	2015-16							28.6	28.6
	2016-17	106.5		75.2		2.4			184.1
	Sub Total	109.4	39.1	75.3	0	2.4	0	28.6	254.8
<b>Grand Total</b>		42.9	15.3	29.6	0.0	0.9	0.0	11.2	100.0
<b>%</b>		19.0	1.2	56.8	6.0	15.9	0.8	0.2	100.0

## 2.16 Creation of SMC Structure

With the objective of arresting soil erosion and increasing moisture stress in the forest area and plantation sites, SMC structures have been created. The various SMC structures done CAMPA APOs include loose boulder check dams, contour trenches, gully plugging etc.

Table 2.24:- SMC Structures created under CAMPA

Circles	Year	SMC Structure (Physical) In Hectares	SMC Structure (Financial) In Lakh Rs.	Finance per 100 Hectares of SMC (Lakh Rs.)
Angul	2009-10	2779.05	59.78	2.15
	2010-11	7042.66	123.89	1.76
	2011-12	3776.36	83.84	2.22
	Sub Total	13598.07	267.51	1.97
Bhubaneswar	2011-12	1577.35	31.33	1.99
	Sub Total	1577.35	31.33	1.99



Circles	Year	SMC Structure (Physical) In Hectares	SMC Structure (Financial) In Lakh Rs.	Finance per 100 Hectares of SMC (Lakh Rs.)
Berhampur	2009-10	7645.11	141.92	1.86
	2010-11	8010.57	143.71	1.79
	2011-12	11430.93	249.91	2.19
	Sub Total	27086.61	535.54	1.98
Sambalpur	2009-10	9790.06	154.99	1.58
	2010-11	4466.91	79.63	1.78
	Sub Total	14256.97	234.61	1.65
Rourkela	2009-10	7656.73	136.37	1.78
	2010-11	2050	36.9	1.8
	2011-12	3591.16	64.63	1.8
	Sub Total	13297.89	101.53	0.76
Baripada	2009-10	1776.32	34.24	1.93
	Sub Total	1776.32	34.24	1.93
Bhawanipatna	2009-10	15211.98	273.3	1.8
	2010-11	6600	119.14	1.81
	2011-12	11060	199.32	1.8
	Sub Total	32871.98	591.76	1.8
Koraput	2009-10	9320	160.32	1.72
	2010-11	4400	79.52	1.81
	2011-12	8170	147.58	1.81
	Sub Total	21890	387.43	1.77
	<b>Total</b>	<b>126355.19</b>	<b>2183.94</b>	<b>1.73</b>

## 2.17 Forest Protection

Forest protection constitutes to be an essential activity in the overall management of forests. However, two destructive factors i.e. biotic interference by way of illegal removal of forest produce with involvement of anti-social elements and to a considerable extent, spread of forest fire stands on the way of forest protection. Adequate protection of forest resources suffers owing to non-availability of adequate manpower, infrastructure and funding. The annual plan of operations being formulated and implemented by state CAMPA have made some provisions for forest protection. Some of the important measures as reflected in the annual plan of operations include augmentation of manpower and strengthening of infrastructure, equipment and mobility enhancement.

### 2.17.1 Forest Protection Squads

Forest protection squads have been deployed at vulnerable sites for capacity enhancement of field staff of forest department. The squads are constituted with 10 persons mainly drawn from the neighbourhood rural employed youth. Each squad is provided with a well-fortified camp at a strategic location which includes a barrack for accommodation of personnel, vehicle for mobility, communication equipment, provision of drinking water etc. The details of 31 vulnerable sites where forest squads were appointed under CAMPA during the period 2010-11 to 2012-13 is mentioned in Table-2.25. As per table-2.26, there





are about 143 forest protection squads appointed under CAMPA in the 31 listed vulnerable sites found in different divisions covered under all forest circles.

*Table 2.25: Details of Vulnerable Sites*

Sl. No	Vulnerable Sites		
	Division	Range	Vulnerable Site
1	Athagarh	Narsingpur	Balikiari
2	Baripada	Kaptipada	Podadiha
3	Ghumsur South	Soroda	Soroda
4	Keonjhar WL	Deogaon	Harichndanpur
5	Nayagarh	Daspalla	Daspalla
6	Khordha	Ranapur	Ranapur
7	BamaraWL	Badrama	Badrama
8	Sambalpur	Dhama	Dhama
9	Paralakhemundi	Mohana	Mohana
10	Dhenkanal	Kamakhya Nagar	Kamkha Nagar
11	Cuttack	Tomka	Tomka
12	Nayagarh	Panchrida	Panchrida
13	Deogarh	Deogarh	Pradhanpat
14	Baripada	Bangriposi	Bangriposi
15	Karanjia	Thakurmunda	Thakurmunda
16	Jeypore	Boipariguda	Boipariguda
17	Bonai	Koida	Koida
18	Keonjhar	Barbil	Barbil
19	Bolangir	Kantabaji	Kantabanji
20	Kalhandi South	Biswanathpur	Musanal
21	Khariar	Sinapali	Sinapali
21	Boudh	Manmunda	Manmunda
22	Berhampur	Khallikote	Sumandal
23	Rourkela	Panposh	Talakudar
24	Sundargarh	Hemgir	Daghora
25	Bonai	Sole	Sole
26	Keonjhar	Telkoi	Bimala
27	Keonjhar WL	Anandpur	Goyalmunda
28	Athamalik	Dhandatopa	Korab
29	Dhenkanal	Hindol	Dandiri
30	Khordha	Balugaon	Berbera
31	Khordha	Balugaon	Dhuanali

*Source: Annual Plan of Operations, 2016-17*



Table 2.26: Physical and Financial progress of appointment of Forest Squads

Circles	Year	Physical Progress (No of Squads appointed)			Financial Progress (Rs. In lakhs)		
		Newly appointed	Previously appointed continued	Total	Newly appointed	Previously appointed continued	Total
Angul	2009-10						0.0
	2010-11				25.0	51.5	76.5
	2011-12	3		3	40.7		40.7
	2012-13	3	2	5	16.1	40.4	56.5
	2013-14		2	2		12.0	12.0
	2014-15		5	5		45.1	45.1
	2015-16		5	5		31.4	31.4
	2016-17		5	5		61.4	61.4
	Sub Total	6	19	25	81.8	241.8	323.6
Bhubne- swar	2009-10						0.0
	2010-11				46.2		46.2
	2011-12	3	1	4	48.1	84.3	132.5
	2012-13	3	2	5	21.2	21.8	42.9
	2013-14		5	5		19.5	19.5
	2014-15		5	5		45.4	45.4
	2015-16						0.0
	2016-17		1	1		12.3	12.3
	Sub Total	6	14	20	115.5	183.3	298.7
Berhampur	2009-10						0.0
	2010-11				11.4		11.4
	2011-12				9.4		9.4
	2012-13	3	1	4	20.7	3.8	24.5
	2013-14	1	1	2	7.7	12.0	19.8
	2014-15		5	5	36.9	22.5	59.3
	2015-16		5	5	44.2	32.0	76.2
	2016-17		5	5	52.2	34.5	86.6
	Sub Total	4	17	21	182.4	104.8	287.2
Sambalpur	2009-10						0.0
	2010-11				48.5		48.5
	2011-12	2		2			0.0
	2012-13	2	1	3	4.3	20.4	24.6
	2013-14		5	5	30.1	2.5	32.6
	2014-15		2	2	18.3	3.1	21.4
	2015-16		2	2	23.1	4.2	27.3
	2016-17		2	2	25.2	17.5	42.7
	Sub Total	4	12	16	149.4	47.6	197.0





Circles	Year	Physical Progress (No of Squads appointed)			Financial Progress (Rs. In lakhs)		
		Newly appointed	Previously appointed continued	Total	Newly appointed	Previously appointed continued	Total
Rourkela	2009-10						0.0
	2010-11				18.3		18.3
	2011-12	4		4			0.0
	2012-13	3	6	9	113.1	25.0	138.0
	2013-14			0			0.0
	2014-15		5	5	30.1	12.5	42.6
	2015-16	1	3	4	29.1	15.9	44.9
	2016-17	3	1	4	11.9	58.7	70.6
	Sub Total	11	15	26	202.5	112.0	314.5
Baripada	2009-10						0.0
	2010-11						0.0
	2011-12				25.8		25.8
	2012-13	3		3		3.4	3.4
	2013-14	2	1	3	7.7	7.5	15.2
	2014-15		2	2		8.7	8.7
	2015-16		1	1	9.5	19.4	28.9
	2016-17	2	2	4	24.5	12.4	36.9
	Sub Total	7	6	13	67.5	51.4	118.9
Bhawani-patna	2009-10						0.0
	2010-11				43.2	6.4	49.6
	2011-12						0.0
	2012-13	3		3		3.5	3.5
	2013-14		3	3	18.1	12.5	30.5
	2014-15		3	3	27.9	15.8	43.8
	2015-16		3	3	32.0	19.2	51.1
	2016-17		3	3	39.4	21.7	61.1
	Sub Total	3	12	15	160.6	79.1	239.7
Koraput	2009-10						0.0
	2010-11				49.7	4.3	54.0
	2011-12		1	1	19.9		19.9
	2012-13			0		3.6	3.6
	2013-14		1	1	7.5	12.5	19.9
	2014-15	1	1	2	3.4	20.7	24.1
	2015-16			0			0.0
	2016-17	1		1		22.5	22.5
	Sub Total	2	3	5	80.4	63.5	144.0
<b>Total</b>		<b>43</b>	<b>98</b>	<b>141</b>	<b>1040.1</b>	<b>883.6</b>	<b>1923.7</b>



### 2.17.2 Employing local persons for forest protection

Apart from forest protection squads, other youths are also deployed in interior theft prone and vulnerable bits to assist the frontline staff in forest protection. These local youth are viewed to be immense importance in view of their role in gathering intelligence, assistance to the frontline staff during inspection, day to day forestry operations and protection duties.<sup>15</sup> Under CAMPA funds, all the 37 territorial forest divisions have been provided with 30 to 60 local youths through service providers in different divisions and by March 2017, 1890 such local persons were employed in all forest divisions. Circle and division wise employment of local youths in connection to forest protection is furnished in table-2.27.

Table 2.27: Division wise engagement of local persons for protection through service providers

Sl.	Name of the Circle	Name of the Division	No of local persons employed	Sl.	Name of the Circle	Name of the Division	No of local persons employed
1	Angul	Angul	30	5	Rourkela	Sundargarh	60
		Athamallik	30			Rourkela	60
		Dhenkanal	30			Bonai	60
		Athagarh	30			Deogarh	60
		Cuttack	60			Keonjhar	60
2	Bhubaneswar	Khordha	30	6	Baripada	Baripada	60
		Nayagarh	60			Karanjia	60
		City Forest	30			Rairangpur	60
3	Berhampur	Phulbani	60	7	Bhawanipatna	Kalhandi(N)	60
		Balliguda	60			Kalahndi(S)	60
		Boudh	30			Subarnapur	60
		Ghumshar(S)	60			Bolangir	60
		Ghumshar (N)	60			Khariar	60
		Paralakhemundi	60	8	Koraput	Rayagada	60
		Berhampur	60			Koraput	60
4	Sambalpur	Jharsuguda	30			Jeypore	60
		Sambalpur	60			Nabarangpur	60
		Rairakhol	60				
		Bargarh	30				
Total Local persons employed							1890

### 2.17.3 Control rooms at Circle and Division Offices

Apart from forest protection squads and appointment of local people, under CAMPA funds, control rooms in all forest circle and division offices have been established and maintained for effective communication both within and outside department. These control rooms have been provided with three attendants, computer and data entry operators to facilitate proper processing of information.

<sup>15</sup> Annual Plan of Operations-2016-17





Table 2.28: Details of Control rooms at Circle &amp; division office

Circles	Year	No of Control rooms Maintained (Physical)			No of Control rooms Maintained (Financial) (Rs. In lakhs)			Amount spent/ Control Room		
		Division level	RCCF Level	Total	Division level	RCCF Level	Total	Division Office	RCCF Office	All
Angul	2009-10			0	13.3		13.3			
	2010-11			0		5.7	5.7			
	2011-12		5	5	24.3	3.5	27.8	4.9	0.7	5.6
	2012-13	5	1	6	17.4	2.5	19.9	2.9	2.5	3.3
	2013-14	7	1	8	2.4	15.8	18.2	0.3	15.8	2.3
	2014-15	1	5	6		23.3	23.3	0.0	4.7	3.9
	2015-16		6	6	21.5	3.7	25.2	3.6	0.6	4.2
	2016-17	5	1	6			0.0	0.0	0.0	0.0
	Sub Total	18	19	37	79.0	54.4	133.4	2.1	2.9	3.6
Bhubaneswar	2009-10			0			0.0			
	2010-11			0	2.7	15.6	18.3			
	2011-12	3	3	6		5.3	5.3	0.0	1.8	0.9
	2012-13		1	1	7.5	2.5	10.0	7.5	2.5	10.0
	2013-14	3	1	4	15.8		15.8	3.9	0.0	3.9
	2014-15	5		5	20.3		20.3	4.1		4.1
	2015-16	5		5	4.0	13.4	17.3	0.8		3.5
	2016-17	1	3	4			0.0	0.0	0.0	0.0
	Sub Total	17	8	25	50.3	36.7	87.0	2.0	4.6	3.5
Berhampur	2009-10			0			0.0			
	2010-11			0		6.0	6.0			
	2011-12		6	6	3.8	34.2	38.0	0.6	5.7	6.3
	2012-13	1	8	9	12.0	21.4	33.5	1.3	2.7	3.7
	2013-14	2	8	10	22.5		22.5	2.2	0.0	2.2
	2014-15	7		7	32.0		32.0	4.6		4.6
	2015-16	8		8	34.5		34.5	4.3		4.3
	2016-17	8		8			0.0	0.0		0.0
	Sub Total	26	22	48	104.8	61.6	166.4	2.2	2.8	3.5
Sambalpur	2009-10			0		6.8	6.8			
	2010-11			0		3.3	3.3			
	2011-12		3	3	20.4		20.4	6.8	0.0	6.8
	2012-13	4		4	2.5	12.5	14.9	0.6		3.7
	2013-14	1	5	6	3.1	13.0	16.1	0.5	2.6	2.7
	2014-15	1	4	5	4.2	16.3	20.5	0.8	4.1	4.1
	2015-16	1	4	5	17.5	4.3	21.8	3.5	1.1	4.4
	2016-17	4	1	5			0.0	0.0	0.0	0.0
	Sub Total	11	17	28	47.6	56.1	103.7	1.7	3.3	3.7



Circles	Year	No of Control rooms Maintained (Physical)			No of Control rooms Maintained (Financial) (Rs. In lakhs)			Amount spent/ Control Room		
		Division level	RCCF Level	Total	Division level	RCCF Level	Total	Division Office	RCCF Office	All
Rourkela	2009-10			0		11.4	11.4			
	2010-11			0		6.5	6.5			
	2011-12		5	5	25.0	3.8	28.7	5.0	0.8	5.7
	2012-13	5	1	6			0.0	0.0	0.0	0.0
	2013-14			0	12.5	2.5	14.9			
	2014-15	5	1	6	15.9	2.5	18.4	2.6	2.5	3.1
	2015-16	5	1	6	58.7		58.7	9.8	0.0	9.8
	2016-17	5		5			0.0	0.0		0.0
	Sub Total	20	8	28	112.0	26.7	138.7	4.0	3.3	5.0
Baripada	2009-10			0			0.0			
	2010-11			0		7.0	7.0			
	2011-12			0	3.4	15.3	18.7			
	2012-13	1	3	4	7.5		7.5	1.9	0.0	1.9
	2013-14	3		3	8.7		8.7	2.9		2.9
	2014-15	3		3	19.4	9.5	28.9	6.5		9.6
	2015-16	2	3	5	12.4		12.4	2.5	0.0	2.5
	2016-17	3		3			0.0	0.0		0.0
	Sub Total	12	6	18	51.4	31.8	83.2	2.9	5.3	4.6
Bhawanipatna	2009-10			0	6.4		6.4			
	2010-11			0		4.9	4.9			
	2011-12		5	5	3.5	23.6	27.1	0.7	4.7	5.4
	2012-13	1	12	13	12.5		12.5	1.0	0.0	1.0
	2013-14	5		5	15.8	3.0	18.9	3.2		3.8
	2014-15	5	1	6	19.2	4.1	23.3	3.2	4.1	3.9
	2015-16	5	1	6	21.7	4.4	26.1	3.6	4.4	4.3
	2016-17	5	1	6			0.0	0.0	0.0	0.0
	Sub Total	21	20	41	79.1	40.0	119.1	1.9	2.0	2.9
Koraput	2009-10			0	4.3		4.3			
	2010-11			0		2.8	2.8			
	2011-12		2	2	3.6	21.9	25.5	1.8	10.9	12.7
	2012-13	1	7	8	12.5		12.5	1.6	0.0	1.6
	2013-14	5		5	20.7		20.7	4.1		4.1
	2014-15	5		5			0.0	0.0		0.0
	2015-16			0	22.5	4.7	27.2			
	2016-17	5	1	6	63.5	29.3	92.9	10.6	29.3	15.5
	Sub Total	16	10	26	127.1	58.7	185.7	4.9	5.9	7.1





#### 2.17.4 Forest Check Gates

Surveillance and management of forest check gates were strengthened under APO 2011-12 and APO 2013-14. There were 46 such check gates as mentioned in table-2.29. There were three attendants per check gate ensuring round the clock vigil and these check gates were equipped with recharging facility of mobile phones, and land phones. However, w.e.f 2017, these check gates were made defunct as per official decisions of the Forest Department, Govt. of Odisha.

*Table 2.29: Details of Forest Check Gates strengthened*

Sl.	Name of Division	No of check gates	Sl.	Name of Division	No of check gates
1	Angul	1	12	Jharsuguda	2
2	Cuttack	2	13	Sundargarh	3
3	Athagarh	1	14	Rourkela	3
4	Mahanadi WL	1	15	Keonjhar	3
5	Khordha	3	16	Kalahandi (North)	1
6	City Forest	1	17	Kalahandi (South)	3
7	Nayagarh	1	18	Bolangir	1
8	Phulbani	5	19	Khariar	3
9	Ghumsur (North)	2	20	Nabarangpur	3
10	Ghumsur (South)	1	21	Jeypore	1
11	Bargarh	4	22	Malkangiri	1
Total no of CAMPA enabled forest check gates					46

#### 2.17.5 Fire Fighting Squad

Forest fire is a regular phenomenon in summer season throughout the state of Odisha as major chunk of forests prevailing in the state are dry deciduous type of forests. The forests of interior eastern and Southern parts of Odisha are more vulnerable to forest fires compared to those in the Eastern coastal parts. Long dry spell with scanty rainfall in those areas contribute to higher incidence of forest fires. The frequency and intensity of forest fires has tended to increase in recent years particularly after 1990s.<sup>16</sup> Due to heavy forest fire in the state, fire fighting squads have been engaged in all the forest divisions of the state. A fire fighting squad comprises 10 persons who are mainly rural unemployed youth being provided with fire fighting equipment were to combat and douse forest fire. The squad is also provided with vehicles for mobility on hiring basis. The squad is deployed for 150 days during the entire fire season starting from February to July. The members of the team are provided with basic training to fight forest fire. 396 forest firing squads were engaged in all ranges for effective fire protection. The fire protection teams are provided blowers and other equipment to combat forest fire. Out of the total fire fighting squads, maximum number of squads were appointed in Berhampur circle followed by Sambalpur and Angul circles.

<sup>16</sup>Annual Plan of Operations-2016-17

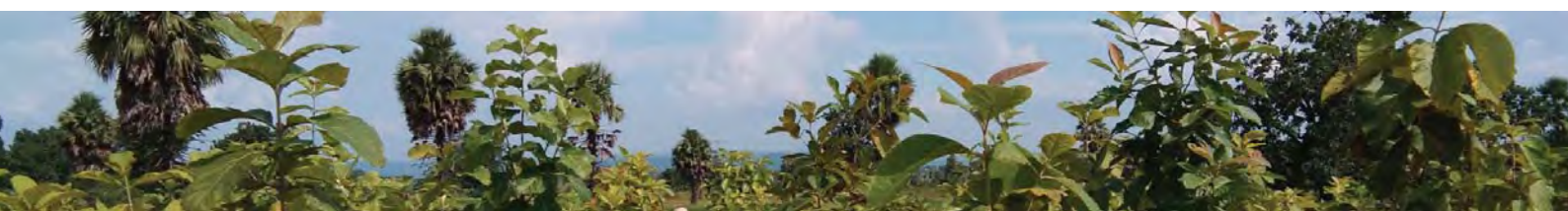


Table 2.30: Physical Progress of Forest Fire squads appointed (No of squads)

Year	Angul	Bhuba- neswar	Berha- mpur	Sambalpur	Rourkela	Baripada	Bhawan- ipatana	Koraput	All Circles	%
2009-10									0	0.0
2010-11							5		5	1.3
2011-12	6		8	5				4	23	5.8
2012-13	10	8	18		14	7		14	71	17.9
2013-14	10	6	14				6		36	9.1
2014-15		27	40	22		19.0			108	27.3
2015-16	27			22	31	19	32		131	33.1
2016-17				22					22	5.6
<b>Total</b>	<b>53</b>	<b>41</b>	<b>80</b>	<b>71</b>	<b>45</b>	<b>45</b>	<b>43</b>	<b>18</b>	<b>396</b>	<b>100.0</b>
%	13.4	10.4	20.2	17.9	11.4	11.4	10.9	4.5	100	

For appointing 396 fire fighting squads in all the forest divisions under all forest circles during the period 2009-10 to 2016-17, an amount of Rs. 1303.3 lakhs were spent. Circle wise financial performance for appointed Forest Fire Squads (FFS) is shown in Table-2.31.

Table 2.31: Financial Progress of Forest fire Squads (Rs. In lakhs)

Year	Angul	Bhuba- neswar	Berha- mpur	Samb- alpur	Rourkela	Baripada	Bhawani- patana	Koraput	All Circles	%
2009-10									0	0.0
2010-11							7		7	0.5
2011-12	7.5		9.7	9.8				4.4	31.4	2.4
2012-13	21.3	10.6	29.5		28.5	24.7		43.5	158.1	12.1
2013-14	37.5	22.5	52.5				22.5		135	10.4
2014-15		96.2	119.9	73.3		63.7			353.1	27.1
2015-16	122.7			88.9	111.5	77.7	125.5		526.3	40.4
2016-17				92.4					92.4	7.1
<b>Total</b>	<b>189</b>	<b>129.3</b>	<b>211.6</b>	<b>264.4</b>	<b>140</b>	<b>166.1</b>	<b>155</b>	<b>47.9</b>	<b>1303.3</b>	<b>100.0</b>
%	14.5	9.9	16.2	20.3	10.7	12.7	11.9	3.7	100.0	

### 2.17.6 Fire Fighting Blowers

In addition to appointing fire fighting squads, fire fighting blowers were also provided at range level by utilizing CAMPA funds. As it is evident from table-2.32, in all forest divisions 1334 number of blowers were purchased during the period 2011-12 to 2016-17. In this direction 240.0 lakhs were spent by all the forest divisions. Physically Baripada circle is found to have around 79.7 percent of the total number of blowers purchased under CAMPA funds. Maximum number of blowers were purchased in the year 2014-15.





Table 2.32: Physical and Financial Progress of the provision of blowers

Year	No of Blowers by Forest Circles									
	Angul	Bhuban- eswar	Berha- mpur	Sambalpur	Rourkela	Baripada	Bhawani- patana	Koraput	All Circles	%
2009-10									0	0.0
2010-11							2		2	0.1
2011-12	6		2	2	4			2	16	1.2
2012-13	2	4	10		11	1		8	36	2.7
2013-14			12						12	0.9
2014-15			16		4	1043			1063	79.7
2015-16			18	12	11	10	5		56	4.2
2016-17		15	82	52					149	11.2
Total	8	19	140	66	30	1054	7	10	1334	100.0
%	0.6	1.4	10.5	4.9	2.2	79.0	0.5	0.7	100.0	
Year	Financial Progress (in Lakh Rs.)									
	Angul	Bhuban- eswar	Berha- mpur	Sambalpur	Rourkela	Baripada	Bhawani- patana	Koraput	All Circles	%
2009-10									0.0	0.0
2010-11							1.1		1.1	0.4
2011-12	2.9		1.6	1.0	4.6			1.1	11.1	4.6
2012-13	1.1	2.6	7.0		5.9	0.2		4.0	20.7	8.6
2013-14			53.4						53.4	22.2
2014-15			11.0		2.8	17.0			30.8	12.8
2015-16			11.3	7.0	7.6	6.0	10.7		42.6	17.7
2016-17		9.8	41.7	28.8					80.3	33.5
Total	4.0	12.4	126.0	36.8	20.8	23.1	11.8	5.1	240.0	100.0
%	1.7	5.2	52.5	15.3	8.7	9.6	4.9	2.1	100.0	

### 2.17.7 Creation and Management of Fire Line

Fire line creation and maintenance is an important step in effective control and management of forest fire. Annually under CAMPA funds, a length of 500 kms fire line for each of forest divisions is prepared before the onset of dry season (forest fire season). The RF, PRF boundaries, compartment lines, prominent extraction paths are covered for the creation and maintenance of the fire line which is called fire line tracing. The details of Fire line tracing and fire-line maintenance for all the circles during the period 2009-10 to 2016-17 is presented in table-2.33. As it is revealed from the following table 13458 KMs of Fire line were traced by all the forest divisions during the period 2009-10 to 2016-17.



Table 2.33: Physical Progress of fire line Tracing and management (in KMs)

Year	Physical Progress of Fire Line Tracing (Fire line in KMs)									
	Angul	Bhuban-eswar	Berha-mpur	Sambalpur	Rourkela	Baripada	Bhawani-patana	Koraput	All Circles	%
2009-10									0.0	0.0
2010-11									0.0	0.0
2011-12	1501.5		2466.1	1360			1276	1000	7603.6	56.5
2012-13	2343.7		3296.6						5640.3	41.9
2013-14									0.0	0.0
2014-15						180			180.0	1.3
2015-16									0.0	0.0
2016-17			35						35.0	0.3
Total	3845.2	0.0	5797.7	1360.0	0.0	180.0	1276.0	1000	13458.9	100
%	28.6	0.0	43.1	10.1	0.0	1.3	9.5	7.4	100.0	
Year	Physical Progress of Fireline maintenance (in Kms)									
	Angul	Bhuban-eswar	Berha-mpur	Sambalpur	Rourkela	Baripada	Bhawani-patana	Koraput	All Circles	%
2009-10									0.0	0.0
2010-11									0.0	0.0
2011-12									0.0	0.0
2012-13		1007.3		1233.9	2636.981	557		2500	7935.2	25.1
2013-14			80						80.0	0.3
2014-15		1567.6	3510	2000					7077.6	22.3
2015-16			4053.12		2620.04		2700		9373.2	29.6
2016-17		820.5	4285.65		2102				7208.2	22.8
Total	0.0	3395.4	11928.8	3233.9	7359.0	557.0	2700.0	2500.0	31674.1	100
%	0.0	10.7	37.7	10.2	23.2	1.8	8.5	7.9	100.0	

As per table-2.34, for tracing out fire lines by all the forest divisions in Odisha during the period 2009-10 to 2016-17, an amount of Rs.297 lakhs were spent. Similarly, for undertaking Fire line maintenance of 31674.1 kms, an amount of Rs.569.7 lakhs were spent. Out of 8 years study period, there is nil expenses incurred for fire line tracing as well as maintenance in three years.

Table 2.34: Financial Progress of fire line tracing and Maintenance

Year	Financial Progress of Fire Line Tracing (in Lakh Rs.)									
	Angul	Bhuban-eswar	Berha-mpur	Sambalpur	Rourkela	Baripada	Bhawani-patana	Koraput	All Circles	%
2009-10									0.0	0.0
2010-11									0.0	0.0
2011-12	14.9		23.2	13.6			13.8	10.0	75.5	25.4
2012-13	38.6		53.6						92.2	31.1
2013-14									0.0	0.0
2014-15						125.9			125.9	42.4





Year	Financial Progress of Fire Line Tracing (in Lakh Rs.)									
	Angul	Bhubaneswar	Berhampur	Sambalpur	Rourkela	Baripada	Bhawani-patana	Koraput	All Circles	%
2015-16									0.0	0.0
2016-17			3.3						3.3	1.1
Total	53.6	0.0	80.1	13.6	0.0	125.9	13.8	10.0	297.0	100.0
%	18.0	0.0	27.0	4.6	0.0	42.4	4.6	3.4	100.0	
Year	Financial Progress of Fireline maintenance (in lakh Rs.)									
	Angul	Bhubaneswar	Berhampur	Sambalpur	Rourkela	Baripada	Bhawani-patana	Koraput	All Circles	%
2009-10									0.0	0.0
2010-11									0.0	0.0
2011-12									0.0	0.0
2012-13		16.6		20.4	38.8	9.2		38.7	123.7	21.7
2013-14			4.0						4.0	0.7
2014-15		25.8	57.9	32.7					116.5	20.4
2015-16			78.4		43.2		51.7		173.3	30.4
2016-17		16.2	85.7		50.3				152.2	26.7
Total	0.0	58.6	226.0	53.1	132.3	9.2	51.7	38.7	569.7	100.0
%	0.0	10.3	39.7	9.3	23.2	1.6	9.1	6.8	100.0	

### 2.17.8 Forest Fire Hotspots

A particular site recurrently affected by forest fire is defined as forest fire hotspot. For intensive intervention under CAMPA, 21084 forest fire hotspots in seven forest circles except Sambalpur forest circle. In these hotspots greater efforts are directed for fire line maintenance. As per following table, intervention in such forest fire hotspots were started in Koraput circle from 2011-12 and since then it has been continuing. In Rourkela circle it was started in the year 2014-15. Maximum intervention on forest fire hotspots were undertaken in the year 2015-16.

Table 2.35: Forest Fire Sites taken up under CAMPA

Year	Number of Forest Fire sites									
	Angul	Bhubaneswar	Berhampur	Sambalpur	Rourkela	Baripada	Bhawani-patana	Koraput	All Circles	%
2009-10									0	0.0
2010-11									0	0.0
2011-12						996			996	4.7
2012-13								2500	2500	11.9
2013-14								2900	2900	13.8
2014-15					1625				1625	7.7
2015-16	2206	2206	2206				1000		7618	36.1
2016-17					1600		1155	2690	5445	25.8
Total	2206	2206	2206	0	3225	996	2155	8090	21084	100.0
%	10.5	10.5	10.5	0.0	15.3	4.7	10.2	38.4	100.0	



### 2.17.9 Promotion and Maintenance of Sacred Groves

As per the provisions of Integrated Development of sacred Groves, Govt. of Odisha has identified 2161 sacred groves in the state. It was targeted to develop 791 sacred groves under CAMPA funds. In the years 2015-16 and 2016-17, 781 sacred groves were developed with the help of CAMPA funds. The developmental activities for sacred groves included plantation of religiously significant species as decided by the community, creation of permanent water source, creation of contingencies with the public, and maintenance of previous plantations and infrastructure development. Comparatively maximum number of sacred groves in Baripada circle, followed by Rourkela and Koraput circle are maintained.

*Table 2.36: Number of sacred groves maintained under CAMPA*

Year	Number of sacred groves									
	Angul	Bhuba- neswar	Berha- mpur	Samba- lpur	Rourkela	Baripada	Bhawani- patana	Koraput	All Circles	%
2015-16	6		12	29		130	49	87	313	40.1
2016-17		4	7	23	180	144	50	60	468	59.9
Total	6	4	19	52	180	274	100	147	781	100.0
%	10.5	10.5	10.5	0.0	15.3	4.7	10.2	38.4	100.0	

## 2.18 Wild Life Management

Wild life protection and conservation and maintenance of wild life habitat constitutes to be an important activity in wild life management. The major threat to wildlife and their habitat are from poachers and timber smugglers. In order to protect the wild life and wild life habitat following measure are undertaken under CAMPA APOs.

### 2.18.1 Deployment of Protection Squads

In order to improve protection capability of forest field functionaries with respect to wild life management, protection squads were appointed in 2011-12 and 2012-13 in all vulnerable areas under all forest circles. These staffs are engaged for patrolling within and outside protected and other forest areas, keeping watch over illegal activities and to pass on the information to the field staff in seizure and arrest of offenders etc. Year wise and circle wise deployment of protection squads and the financial outlay involved is as per table 2.37. It is found that during the years 2011-12 and 2012-13, 815 protection squads were appointed under all the forest circles. Out of the total number of forest squads appointed under CAMPA interventions, about 40 percent are in Angul circle. Followed by Bhawaniptna circle (17.9%) and Baripada circle (15.1%). About 83.4 percent of wild life protection squads were appointed in the year 2011-12 and the remaining 16.6 percent in the year 2012-13. However, in subsequent years after 2012-13, the appointment of such protection squads are found discontinued.

*Table 2.37: Appointment of Protection Squads under Wild Life Management*

Year	Angul	Bhuba- neswar	Berha- mpur	Samba- lpur	Rourkela	Baripada	Bhawani- patana	Koraput	All Circles	%
2011-12	309	10	8	28	51	108	131	35	680	83.4
2012-13	30	45	14	5	7	15	15	4	135	16.6
Total	339	55	22	33	58	123	146	39	815	100.0
%	41.6	6.7	2.7	4.1	7.1	15.1	17.9	4.8	100.0	





The financial outlay involved for appointed wild life management squads as mentioned in table-2.38 indicates that an amount of Rs.828.1 lakhs were spent for appointing 781 squads as calculated in the previous table. As per available statistics, wild life squads under CAMPA funds were appointed only in two years 2011-12 and 2012-13.

*Table 2.38: Financial outlay for appointing wild life squads*

Year	Angul	Bhubaneswar	Berhampur	Sambalpur	Rourkela	Baripada	Bhawani-patana	Koraput	All Circles	%
2011-12	40.4	101.9	55.6	50.7	44.8	39.0	26.9	21.7	381.1	46.0
2012-13	87.8	112.3	48.1	48.1	27.1	67.1	38.9	17.6	447.0	54.0
Total	128.3	214.2	103.7	98.9	71.9	106.0	65.8	39.3	828.1	100.0
%	15.5	25.9	12.5	11.9	8.7	12.8	7.9	4.8	100.0	

### 2.18.2 Deployment of river and sea patrolling squads

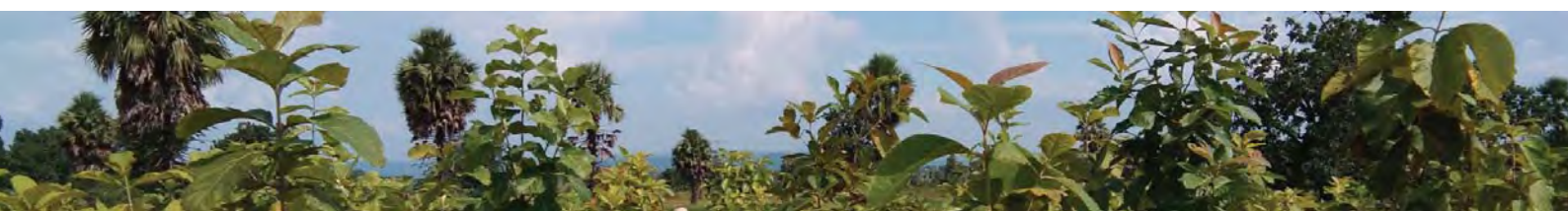
Aquatic fauna like crocodiles, birds etc and marine fauna like olive rudely require protection against illegal catch. For this purpose, river and sea patrolling squads have been deployed in coastal forest and wild life divisions. Each squad consists of 10 persons who are mostly local unemployed youths. As it is found from table-2.39, altogether 56 vehicles and boats were supplied to the squad in 2011-12. In subsequent years, the provision of vehicles and boats were not the priority of CAMPA intervention.

*Table 2.39: No of Vehicles and boats supported to river and sea patrolling staff*

Sl. No	Name of Circle	No. of Vehicles and Boats provided under CAMPA in the year 2011-12	% Share
1	Angul	9	16.1
2	Bhubaneswar	11	19.6
3	Berhampur	7	12.5
4	Sambhalpur	8	14.3
5	Rourkela	6	10.7
6	Baripada	7	12.5
7	Bhawanipatna	3	5.4
8	Koraput	5	8.9
	<b>Grand Total</b>	<b>56</b>	<b>100.0</b>

### 2.18.3 Deployment of Anti- Depredation Squads

Disturbances in the wild life habitats and pressure on their food and fodder resources have led to movement of wildlife specifically elephants and bears into human habitations resulting in human animal conflict. Interstate migration of elephants is also reported causing large scale damage of lives and properties in most of the bordering districts of state. In order to prevent and control human animal conflict and to augment anti-depredation capability of forest field functionaries, anti- depredation squads have been deployed under CAMPA APOs. Like all other squads, anti-depredation squads also consist of 10 persons mostly locally unemployed youths. Each squad is provided with vehicle for mobility, communication equipment.



#### 2.18.4 Engagement of Elephant Trackers

Elephant trackers are appointed in elephant movement areas to pass on information about the movement of elephants and to make aware the public and staff about elephant movement.

#### 2.18.5 Fencing

In order to check the entry of wild animals into human habitations and to avoid subsequent depredations, provision of fencing with trenches, stone walls, solar power and wire mesh are created as a part CAMPA APOs.

#### 2.18.6 Strengthening of communication

For improving the performances of wild life protection squads and anti-depredation squads, it is essential that they should have better communication facilities for which they are supported with VHF/GPS sets, new mobile sets and recharging and maintenance of mobile sets.

#### 2.18.7 Establishment of Control Rooms in wild Life Divisions

For effective communication both within and outside department, as per the CAMPA APOs provisions have been created for the establishment of control rooms in all of the wild life divisions. These control rooms are provided with two attendants, computers and one data entry operator to facilitate proper processing of information.

#### 2.18.8 Maintenance of Forest Roads

For the protection of forest, it is essential that forest roads need to be regularly maintained so as to make the roads motorable. As per the provisions of CAMPA APOs, all the forest roads particularly under Wild life divisions are being maintained regularly.

### 2.19 Ama Jungle Yojana

Ama Jungle Yojana is one of the premier people oriented forestry schemes of Govt. of Odisha being implemented through Odisha Forestry Sector Development Society to promote sustainable forest management in the state with emphasis on livelihood support for the communities living in forest fringe villages with a total project cost of Rs.1170.03 crore for a six years' time period. Strengthening of the community-based initiative for protection of the forest and creation of alternative livelihood opportunities to reduce pressure on forest is envisaged under the scheme. The objectives of AJY are to conserve and restore degraded forests with active engagement

- \* Arms Training which are to be carried out with the help of District Police at the division level. Such training programmes will be conducted for a batch of 40 persons twice in a year.
- \* Computer literacy training consisting of basic applications of computer in MIS will be imparted to the range level staff to be conducted at divisional level.
- \* Training for the frontline staff on forest laws and other related laws. A Batch consisting of 30 staff in each range will be trained every year utilizing the services of legal experts.
- \* Specialized training on technical Forestry matters including nursery techniques, watershed management and the techniques in mobilizing community participation in NRM.







of communities living in the forest fringe by developing their skills through capacity building and creation of alternative opportunities to reduce pressure on forest. Under this programme the activities taken up include Preparatory works (Survey and Documentation; Boundary Clearance, Construction of RCC Pillars, Carriage, Loading and Unloading, digging of pit and posting of plants); Publication and Communication; Micro Plan Preparation; support activities like capacity building of forest personnel and support personnel; Forest Restoration and Plantations like ANR without gap plantation (Preliminary Operations), ANR without gap plantation in 1st year and Block Plantation. Up to the APO 2016-17 implemented in the year 2017-18, 500 VSSs were covered in 30 forest divisions.

## 2.20 Research Development and Capacity Building

National CAMPA Advisory Council in their recommendation has earmarked a budget of maximum 5% of NPV to address needs-based research. Accordingly, CAMPA APOs in Odisha have focus on research activities relating to maintenance of tree genome bank, preservation of biodiversity, introduction of new species in afforestation, study of different techniques in afforestation works.

Training and capacity building activities constitutes to be an integral part of the human resource development of the department and the frontline staff are expected to be equipped to face new challenges and opportunities in the forestry sector. The fresh entrants are to be adequately exposed to the recent trends in forest management and legal aspects of management. They should be able to handle hi tech devices used for forest protection and management. In this background CAMPA APOs adequately emphasize the need of training and capacity development at range level in all the forest divisions. The training programmes as provided in the following box is considered on priority basis under CAMPA APOs.<sup>17</sup>

There are three types of training and capacity development programmes undertaken under CAMPA which include Theme based Training, strengthening communication and capacity building. As it can be seen from table- 45 that during the period 2009-10 to 2016-17, 187 training programmes were conducted at division level and about 651 training programmes were conducted at range level. Maximum number of training programmes at division levels as well as range levels were conducted at Bhawanipatna circle followed by Sambalpur and Rourkela. Apart from theme-based training programmes, a number of awareness programmes about CAMPA intervention were conducted during the initial years of CAMPA implementation. As it can be seen from table-2.40, such programmes were organized upto the year 2011-12 except Bhubaneswar circle. In Bhubaneswar circles, the awareness programmes were continued upto the year 2013-14. Various capacity development programmes were organized through range/division level trainings, regional and state level workshops, radio and TV programmes etc.

<sup>17</sup> Forest Department (210-11): Annual Plan of Operations, State CAMPA, Odisha



Table 2.40: Number of Theme based Training Programmes conducted under CAMPA at Division(D) and Range(R) Levels

Year	Angul		Bhubaneswar		Berhampur		Sambalpur		Rourkela		Baripada		Bhawaniapatana		Koraput		All Circles	
	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R
2009-10																	0	0
2010-11																	0	0
2011-12			3	23	3	23	8	29	10	43			7	51	4	31	35	200
2012-13	18	43	7	24	22	73	9	34	16	52	7	31	18	56	9	33	106	346
2013-14			14	39			12	35			10	31	10				46	105
2014-15																	0	0
2015-16																	0	0
2016-17																	0	0
Total	18	43	24	86	25	96	29	98	26	95	17	62	35	107	13	64	187	651





Table 2.41: No of Programmes conducted for strengthening communication

Name of Circle	Year	Strengthening Communication		
		Observation of Important Days	Awareness meetings	Afforestation/ Reforestation Activities
Angul	2009-10			
	2010-11	4	19	
	2011-12			
	2012-13			
	2013-14			
	2014-15			
	2015-16			
	2016-17			
	Sub Total	4	19	0
Bhubaneswar	2009-10			
	2010-11			
	2011-12	3	8	0
	2012-13			
	2013-14		14	
	2014-15			
	2015-16			
	2016-17			
	Sub Total	3	22	0
Berhampur	2009-10			
	2010-11	10	31	
	2011-12			
	2012-13			
	2013-14			
	2014-15			
	2015-16			
	2016-17			
	Sub Total	10	31	0
Berhampur	2009-10			
	2010-11	4	10	
	2011-12	3		
	2012-13	8		
	2013-14			
	2014-15			
	2015-16			
	2016-17			
	Sub Total	15	10	0



Name of Circle	Year	Strengthening Communication		
		Observation of Important Days	Awareness meetings	Afforestation/ Reforestation Activities
Rourkela	2009-10	14	37	
	2010-11			
	2011-12			
	2012-13	9		
	2013-14			
	2014-15			
	2015-16			
	2016-17			
	Sub Total	23	37	0
Baripada	2009-10			
	2010-11	2	13	
	2011-12			
	2012-13			
	2013-14			
	2014-15			
	2015-16			
	2016-17			
	Sub Total	2	13	0
Bhawanipatna	2009-10			
	2010-11	5	22	
	2011-12	6		
	2012-13			
	2013-14			
	2014-15			
	2015-16			
	2016-17			
	Sub Total	11	22	0
Koraput	2009-10			
	2010-11	5	10	
	2011-12	3	4	
	2012-13			
	2013-14			
	2014-15			
	2015-16			
	2016-17			
	Sub Total	8	14	0
All Circles		76	168	0





Table 2.42: Number of Capacity Development Programmes organized under CAMPA during the period 2009-10 to 2016-17

Name of Circle	Year	Capacity Building						
		Range Level Training	Divisional level Training	Regional/ State level work shop	Observation of Important Day	Training & Awareness Meeting	Radio and TV. Program	Tn. & Awareness
<b>Angul</b>	2009-10							
	2010-11							30
	2011-12							
	2012-13			1	11			
	2013-14	14	14	39	7			
	2014-15							
	2015-16							
	2016-17							
	Sub Total	14	14	40	18	0	0	30
<b>Bhubaneswar</b>	2009-10							
	2010-11							
	2011-12				6	6		
	2012-13	3			10			
	2013-14	39	39	1	7			
	2014-15							
	2015-16							
	2016-17							
	Sub Total	42	39	1	23	6	0	0
<b>Berhampur</b>	2009-10							
	2010-11							
	2011-12				6	6		
	2012-13	1			6			
	2013-14							
	2014-15							
	2015-16							
	2016-17							
	Sub Total	1	0	0	12	6	0	0
<b>Sambalpur</b>	2009-10							
	2010-11							
	2011-12						1	12
	2012-13	1				1		
	2013-14	12			6	35		



Name of Circle	Year	Capacity Building						
		Range Level Training	Divisional level Training	Regional/ State level work shop	Observation of Important Day	Training & Awareness Meeting	Radio and TV. Program	Tn. & Awareness
	2014-15							
	2015-16							
	2016-17							
	Sub Total	13	0	0	6	36	1	12
<b>Rourkela</b>	2009-10							
	2010-11							
	2011-12				6	27		
	2012-13	1				1		
	2013-14							
	2014-15	12	12	35	6		35	
	2015-16							
	2016-17							
	Sub Total	13	12	35	12	28	35	0
<b>Baripada</b>	2009-10							
	2010-11							
	2011-12							
	2012-13			1	1	2		
	2013-14	31	31	1	5			
	2014-15							
	2015-16							
	2016-17							
	Sub Total	31	31	2	6	2	0	0
<b>Bhawanipatna</b>	2009-10							
	2010-11							
	2011-12						1	13
	2012-13	1			9			
	2013-14	10	31	31				
	2014-15			31	5		1	
	2015-16							
	2016-17							
	Sub Total	11	31	62	14	0	2	13





Name of Circle	Year	Capacity Building						
		Range Level Training	Divisional level Training	Regional/ State level work shop	Observation of Important Day	Training & Awareness Meeting	Radio and TV. Program	Tn. & Awareness
<b>Koraput</b>	2009-10							
	2010-11							
	2011-12			1	5	2		
	2012-13							
	2013-14	10	10	31	5	31		
	2014-15							
	2015-16							
	2016-17							
	Sub Total	10	10	32	10	33	0	0
<b>All Cicles</b>		<b>135</b>	<b>137</b>	<b>172</b>	<b>101</b>	<b>111</b>	<b>38</b>	<b>55</b>

## 2.21 Infrastructure Development

Inadequate budgetary support under the non-plan was considered as a most important bottleneck in developing infrastructure facilities at the cutting-edge level. The guidelines issued by the MoEF for management of CAMPA funds has adequately addressed this issue and consequently infrastructure development has been given due attention in all of the CAMPA APOs since 2009-10.

Forest range is the most important administrative unit of forest protection, management and implementation of plans and programmes. Considering manifold increase in the role and responsibility of forest range officers and inadequacy of infrastructure available at range level, under CAMPA APOs, top most priority under CAMPA APOs is accorded in strengthening infrastructure and augmenting manpower at range level. Various activities undertaken for strengthening ranges are as follows.

- A proper office building with facility for interaction with and imparting instructions to staff along with adequate space for lodging the arrested/ detained offenders (Hazats), before their production in the court.
- Barrack facilities for strike force.
- Malkhana for safe storage of seized produce during trial in the court.
- Proper compound wall and gate for safety and security of the range office complex.
- Common toilet facility.
- Water supply system with overhead tank.
- Vehicles (Jeep and Motor Cycle) for mobility with adequate provision for fuel and contractual driver.
- Installation of computer and internet facility along with provision for contractual data entry operator and other office facilities. It is also ensured that there should be braod band connectivity for proper communication between division and range offices.
- Essential repairs of the residential quarters of range officer and other protection staff in the range headquarters.



The details of infrastructure development during the study period 2009-10 to 2016-17 undertaken in all the forest divisions is as shown in table-2.43. Range office buildings, Section office buildings, bit houses, Residential quarters for forest department officials, Forest Rangers' quarters are found to be major construction activities undertaken with the aid of CAMPA funds. Water facility through tube wells and piped water supply to residential quarters are also undertaken.

*Table 2.43: Infrastructure Activities undertaken under CAMPA*

Sl.	Type of Infrastructure Facility	Units	Angul	Bhubaneswar	Berhampur	Sambhalpur	Rourkela	Bari-pada	Bhawanipatna	Koraput	All Circles
1	Service provider	No	6	0	3	0	0	0	0	0	9
2	Forest Section House	Phy	26	22	30	28	28	16	26	22	198
3	Beat House	Phy	43	23	40	34	42	28	36	24	270
4	GPS devices	No	44	24	72	100	53	20	60	45	418
5	Computers	No	3	2	8	4	1	0	0	3	21
6	Motor Cycles	No	0	0	0	2	0	0	0	0	2
7	Range Office Buildings	No.	71	37	62	41	37	66	29	45	388
8	Vehicle-Bolero	No.	12	5	12	6	6	9	8	12	70
9	Motor cycle	No.	37	32	37	29	34	33	29	28	259
10	Seizure Yard	No.	18	14	21	22	24	27	29	20	175
11	Residential quarters	No.	31	25	40	45	52	25	88	39	345
12	Tube Well	No.	61	47	96	89	120	82	153	82	730
13	Forest Roads	Km.	761	560	880	845	1466	709	811	311	6343
14	Culverts	No.	55	53	107	93	110	64	100	72	654
15	Causeways	No.	127	80	251	123	209	119	245	138	1292
16	Creation of Water Body	No	70	35	94	55	70	42	70	62	498
17	Permanent Nursey	No	29	39	55	36	35	35	31	35	295
18	Checking Station	No	4	5	8	9	28	0	9	5	68
19	Res. Qrs. of Forester.	No	51	41	64	52	54	43	45	33	383
20	Res. Qrs. of FG	No	115	73	159	113	135	94	124	84	897
21	Water Facility	No	13	12	13	20	17	14	10	19	118
22	Common toilet facility	No	14	14	13	21	17	12	10	19	120
23	Barrack at Range Office complex	No	13	16	16	11	12	10	12	9	99





Sl.	Type of Infrastructure Facility	Units	Angul	Bhuban-eswar	Berha-mpur	Sambh-alpur	Rour-kela	Bari-pada	Bhawa-nipatna	Kora-put	All Circles
24	Malkhana at Range office complex	No	7	7	8	5	6	4	10	4	51
25	Boundary Wall	Metres	7832	8646	12870	8765	10770	7660	10420	6532	73495

## 2.22 Forest IT and Working Plan Exercise

With the objective of digitisation of delivery, smoothening of operations and strengthening the MIS, CAMPA APOs have a consistent focus on promoting IT enabled services in forest department. In this direction following activities have been taken up under CAMPA.

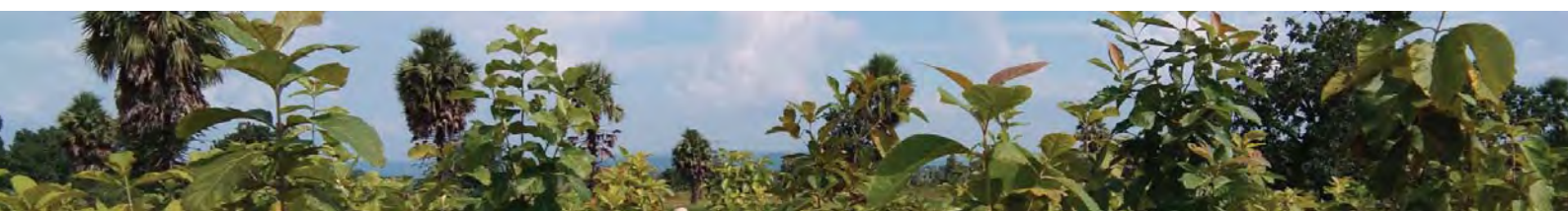
- Operationalisation of web-based enterprise GIS solutions.
- Payments towards hardware and software procurements, installations and maintenance.
- Payment of cost technical manpower such as computer experts and GIS experts.
- Training to departmental staff for IT and e-governance activities.
- Taking up working plan exercise and digitisation of forestry boundary.

## 2.23 Monitoring, Evaluation and Accounting

Under this component, the work involves monitoring and evaluation of CAMPA activities regularly by an independent/ 3rd party organisation to assess the quality as well as effective utilisation of funds.

## 2.24 Summary

- Till date, the state CAMPA, Odisha has formulated 8 annual plans of operation and the total funds received from the Adhoc CAMPA upto APO year 2016-17 stands at Rs. 1869.15 crores and the expenditure ending November, 2017 stands at Rs. 1580.97 crores which is 84.85% of the funds received.
- The core activities from CAMPA fund comprises Plantation Activities, creation of SMC measures, Forest Protection, Wildlife Management, Ama Jungle Yojana and Sacred Groves.
- Similarly, the non-core activities by utilizing CAMPA funds comprise of Research Development and Capacity Building; Infrastructure Development; Forest IT and Working Plan Exercise; Monitoring, Evaluation and Accounting.
- Out of the total block plantation during the period 2009-10 to 2017-18, about 98 percent of block plantation has been done during the initial two years.
- Since 2013-14, a rising trend of bald hill plantation is observed.
- Implementation of avenue plantation was focussed only in the initial year 2009-10. Subsequently, implementation of such plantation activity was discontinued in the CAMPA APOs in all circles except Rourkela.



- During the initial three years of CAMPA APOs, compensatory afforestation was undertaken for two years only in all the circles and it was implemented during initial three years from 2009-10 to 2011-12.
- ANR plantation activities owing to its inherent merits of natural regeneration of trees have been accorded more priority in CAMPA APOs.
- silvicultural operations were undertaken by all the forest circles during the initial years of CAMPA implementation.
- Regeneration of bamboo is found to be of focussed intervention in all CAMPA APOs. However, Berhampur circle, followed by Koraput, Rourkela and Sambalpur circles have more implemented the programme relative to other circles. Bamboo regeneration is not reported for Baripada circle under CAMPA implementation.
- Management of old teak plantation which are of more than 10 years continued as a part of CAMPA APOs upto the year 2013-14 and thereafter it got discontinued.
- Subsidiary silvicultural operations for timber under CAMPA intervention, were undertaken for two years 2013-14 and 2014-15 in all circles except Bhubaneswar circle.
- Uprooting of invasive weeds were done in the year 2009-10 in all the forest circles. After 2009-10, it has not been reported in any of the forest circles.
- Management of economic species was implemented only for two years 2010-11 and 2011-12.
- The various SMC structures done CAMPA APOs include loose boulder check dams, contour trenches, gully plugging etc. It is reported that SMC structures undertaken under CAMPA are site specific and undertaken as per need assessment by frontline forest officers.
- Augmentation of manpower by employing forest protection squads, local youths and strengthening of infrastructural activity like Forest protection barracks, and investing in fire safety equipment like blowers etc has constituted added focus for forest protection under CAMPA.
- By the end of 2016-17 about 500 sacred groves were already developed under CAMPA. Due to such activities, the neighbourhood community were found more proactive with the activities undertaken by forest department officials.
- In order to protect the wild life and wild life habitat, CAMPA APOs have dedicated provisions for wild life management. A range of activities comprising of deployment of wild life squads, river/sea squads, anti-depredation squads, elephant trackers etc are undertaken under CAMPA.
- Local VSSs are also supported under AJY. About 2/3rd of the sampled out VSSs state that due to CAMPA, there has been better conservation and protection of forest resources and increased livelihood opportunities for VSS members.
- There are three types of training and capacity development programmes undertaken under CAMPA which include Theme based Training, strengthening communication and capacity building.
- Range office buildings, Section office buildings, bit houses, Residential quarters for forest department officials, Forest Rangers' quarters are found to be major construction activities undertaken with the aid of CAMPA funds. Standard designs are followed for these construction activities as all such construction works are directly done by the Forest Department.





## 2.25 Area of the Site:

Plantation in eight circle covers a total area of 2,84,856 ha. since 2009-10 to 2016-17 i.e., on an average 35,607 ha. per year, irrespective of type of plantation. Plantation by categories reflects that the circles has highest area of plantation under ANR with Gap Plantation category, followed by Block Plantation and CA-PCA Plantation. Similarly, under silvicultural operation, the area coverage remains to be 995791 ha. irrespective of operational typology.

Plantation activities and silvicultural operations have been taken up since 2009-10 under CAMPA. Major plantation activities have been in the year 2009-10, 2014-15 and 2015-16. Plantation activities seems comparatively less in the years 2011-12, 2012-13 and 2016-17. Though silvicultural operations in different sites were in force, specific investments made for silvicultural operations under CAMPA from 2010-11 to 2015-16. Year wise distribution of sites by plantation and silvicultural operation is presented in the figure.

The average plantation area of the studied sites observed to be 68.2 ha. with total plantation area of 17,054.8 ha. Of the total plantation area, 65.1 percent are ANR with gap plantation, followed by block plantation (20.3 percent). Bamboo plantation and bald hill plantation has been less, i.e., 5.3 percent and 2.7 percent respectively.

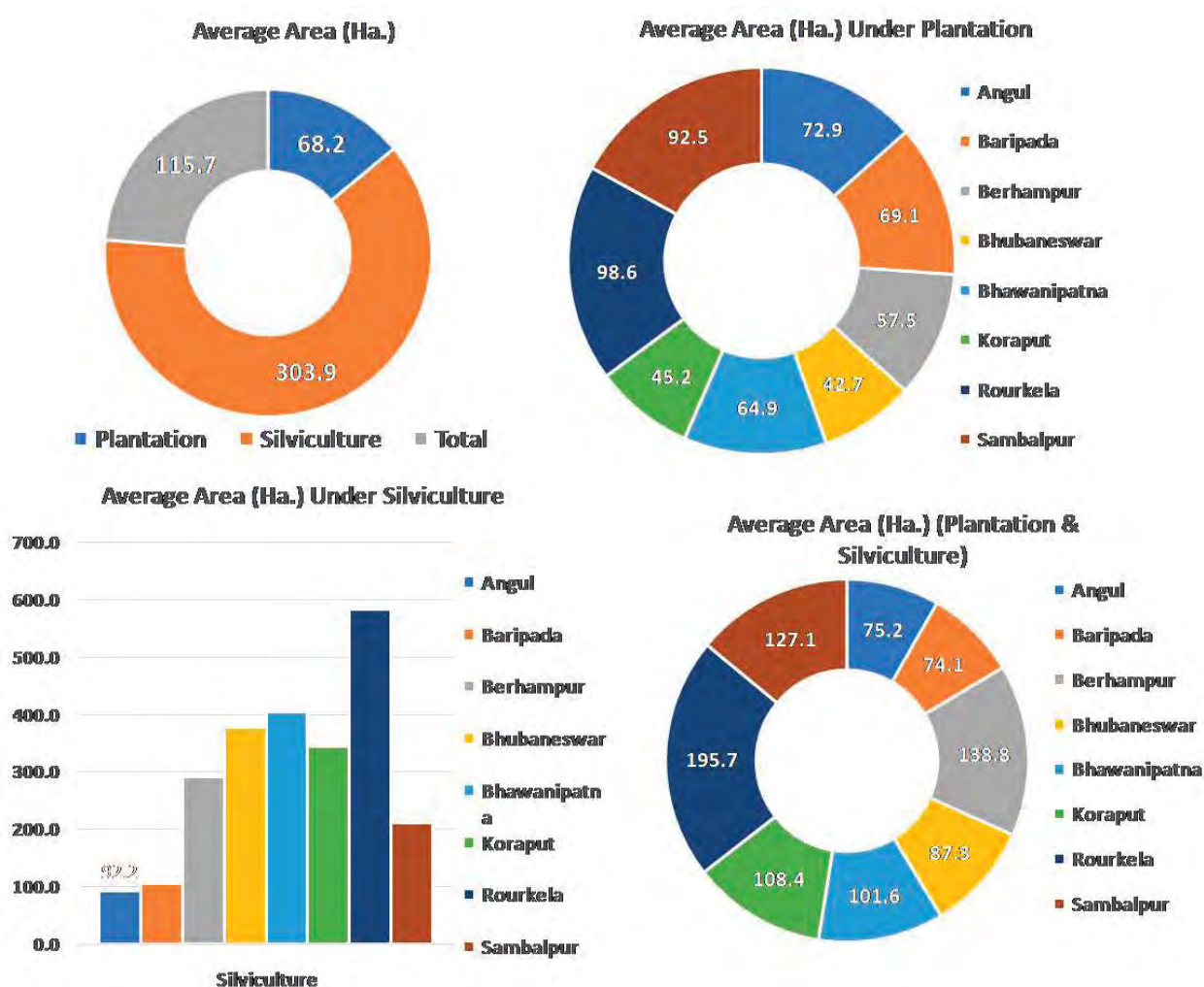


Figure 2:15: Average Area (Ha.) of Plantation & Silvicultural Operations Sites



Average area under silvicultural operation, irrespective of its type, is 303.9 ha. with total area of 19,144.6 ha. In the silvicultural operation, emphasis has been given to SSO Bamboo (77.3 percent of the total area) followed by SSO timber (14.2 percent of the total area). Average area under plantation and silvicultural operations by forest circle is presented in the figure as follows.



Figure 2:16: Average Area (Ha.) of the Sites by Circle





## 2.26 Plant Survival Rate:

Plant survival rate varies by plantation categories and also by forest divisions. Overall, survival rate is calculated to be 89.1 percent (all circle combines). Highest plant survival is reported in Sambalpur (93.1 percent) forest circle followed by Rourkela (91.3 percent) and Baripada (91.0 percent). Plant Survival Rate in Bhubaneswar and Berhampur circle is relatively less due to damage of plantation sites in the cyclonic storm. Plant survival by plantation categories are discussed below.

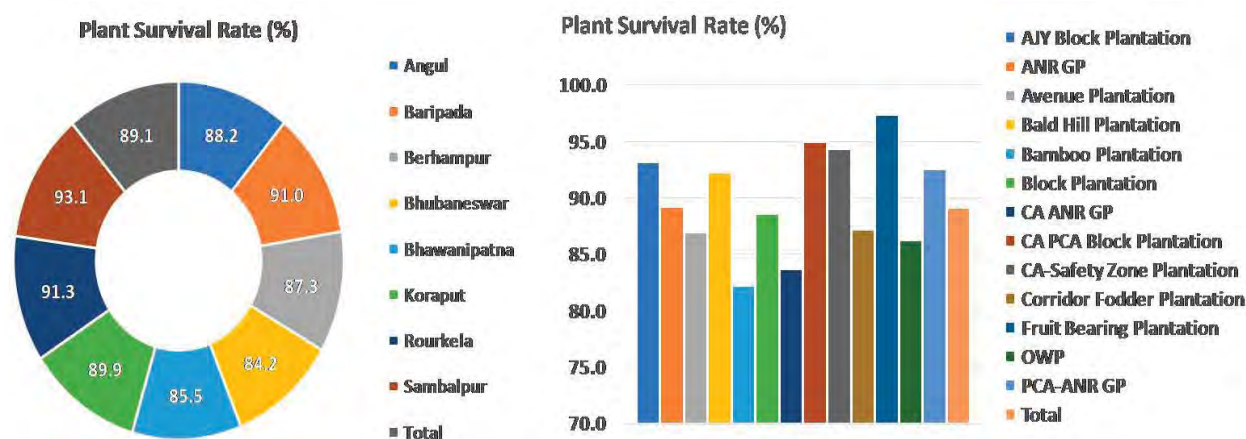


Figure 2:17: Overall Plant Survival Rate

### 2.26.1 Block Plantation:

Average number of plants per ha., varies considerably across sites, plots, by type of plantation and also by forest circles and divisions. In block plantation, average no. of plants per ha. enumerated to be 1,443 with highest average number of plants in Bhubaneswar (CA PCA) (1575) and lowest in Kalahandi forest circle (1288). The plant survival rate varies from 98.4 percent (Bhubaneswar circle, CA PCA) to 73.0 percent (Bhubaneswar circle).

### 2.26.2 Bald Hill Plantation:

Bald hill plantation observed in seven forest circles, i.e., Angul, Baripada, Berhampur, Bhubaneswar, Kalahandi, Koraput and Rourkela. In bald hill plantation, average no. of plants per ha. enumerated to be 1,510 with highest of 1,580 in Baripada circle) and lowest in Berhampur (1403). The survival rate of the plants under these categories found to be lowest in Berhampur (87.7 percent) and highest in Baripada (98.8 percent).

### 2.26.3 ANR with Gap Plantation:

ANR with gap plantation (enrichment planting) is taken in a dual mode, i.e., dense plantation in block mode in identified patch of land and/or sparse / scattered plantation in the forest area. Plot specific plant count varies across plots and by forest division. As plantation mode has been of different nature, total plants planted and plants standing on the ground were taken in to account to estimate survival and mortality rate per ha. Average number of plants per ha. enumerated to be 119 with highest number of plants per ha. in Sambalpur circle (187 per ha.) and lowest in Koraput (176 per ha.) and Berhampur (176 per ha.). Plant survival rate varies between 93.6 percent (Sambalpur circle) to 88.13 percent (Koraput circle).



Plant survival rate by forest circle and type of plantation is presented in the figures.



Figure 2:18: Plant Survival Rate by Forest Circle





Ranking of sites by plant survival rate reveals that about 23.4 percent are in >95% survival category, 15.5 percent are in the >93% & ≤95 % category followed by 17.3 % in >90 % to ≤93 % category. Aggregating different survival rate categories, it can be concluded that 93.2 percent sites have plant survival rate within 80.0 percent and 87.1 percent sites have plant survival rate within 85.0 percent. Ranking of plantation sites based on plant survival rate for all the forest circles is presented in matrix below.

*Table 2.44: Plant Survival Rate by Plantation Categories*

All Forest Circles	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	>95	>93 ≤95	>90 ≤93	>88 ≤90	>85 ≤88	>80 ≤85	>75 ≤80	>70 ≤75	≤70
AJY Block Plantation	33.3		33.3	33.3					
ANR GP	21.3	16.8	17.3	13.4	9.7	8.7	5.8	3.9	3.1
Avenue Plantation	13.3	6.7	40.0	6.7	6.7	13.3		6.7	6.7
Bald Hill Plantation	24.1	31.0	17.2	3.4	6.9	17.2			
Bamboo Plantation				10.0		50.0	40.0		
Block Plantation	29.8	11.7	17.0	11.1	8.8	7.6	6.4	2.3	5.3
CA ANR GP				25.0	37.5		25.0	12.5	
CA PCA Block Plantation	45.5	27.3	18.2	9.1					
CA-Safety Zone Plantation		100.0							
Corridor Fodder Plantation		50.0				50.0			
Fruit Bearing Plantation	100.0								
OWP					100.0				
PCA-ANR GP	25.0		25.0	50.0					
<b>Total</b>	<b>23.4</b>	<b>15.5</b>	<b>17.3</b>	<b>12.4</b>	<b>9.3</b>	<b>9.3</b>	<b>6.1</b>	<b>3.3</b>	<b>3.5</b>

*Table 2.45: Plant Survival Rate by Plantation Categories & Forest Circle*

Plant Survival Rate-FC Wise	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	>95	>93 ≤95	>90 ≤93	>88 ≤90	>85 ≤88	>80 ≤85	>75 ≤80	>70 ≤75	≤70
Angul FC									
ANR GP	2.2	15.6	28.9	17.8	20.0	11.1	4.4		
Avenue Plantation			100.0						
Bald Hill Plantation		66.7				33.3			
Block Plantation	8.3	8.3	19.4	16.7	19.4	11.1	5.6	2.8	8.3
<b>Total</b>	<b>4.7</b>	<b>14.0</b>	<b>25.6</b>	<b>16.3</b>	<b>18.6</b>	<b>11.6</b>	<b>4.7</b>	<b>1.2</b>	<b>3.5</b>
Baripada FC									
ANR GP	26.5	12.2	18.4	20.4	10.2	2.0	6.1	4.1	
Avenue Plantation		33.3	33.3			33.3			
Bald Hill Plantation	100.0								
Block Plantation	52.6	21.1	10.5	5.3	5.3				5.3
<b>Total</b>	<b>35.1</b>	<b>14.9</b>	<b>16.2</b>	<b>14.9</b>	<b>8.1</b>	<b>2.7</b>	<b>4.1</b>	<b>2.7</b>	<b>1.4</b>
Berhampur FC									



Plant Survival Rate-FC Wise	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	>95	>93 <=95	>90 <=93	>88 <=90	>85 <=88	>80 <=85	>75 <=80	>70 <=75	<=70
ANR GP	16.4	9.0	13.4	13.4	11.9	16.4	10.4	4.5	4.5
Avenue Plantation	100.0								
Bald Hill Plantation			66.7			33.3			
Block Plantation	36.8	10.5	10.5	15.8		5.3	10.5		10.5
CA ANR GP				33.3			33.3	33.3	
Total	21.3	8.5	13.8	13.8	8.5	13.8	10.6	4.3	5.3
Bhubaneswar FC									
ANR GP	25.0	31.3	12.5	6.3	12.5	6.3	6.3		
Avenue Plantation			33.3	16.7	16.7	16.7		16.7	
Bald Hill Plantation		50.0				50.0			
Block Plantation	14.3		14.3	14.3		28.6	7.1		21.4
CA PCA Block Plantation	100.0								
Total	17.9	15.4	15.4	10.3	7.7	17.9	5.1	2.6	7.7
Kalahandi FC									
AJY Block Plantation	50.0			50.0					
ANR GP	6.6	31.1	9.8	6.6	11.5	4.9	8.2	13.1	8.2
Avenue Plantation			50.0						50.0
Bald Hill Plantation		44.4	11.1	11.1	22.2	11.1			
Block Plantation			18.2		9.1	9.1	36.4	27.3	
Fruit Bearing Plantation	100.0								
OWP					100.0				
Total	6.9	26.4	11.5	6.9	12.6	5.7	10.3	12.6	6.9
Koraput FC									
ANR GP	26.5	18.4	10.2	10.2	4.1	12.2	8.2	4.1	6.1
Bald Hill Plantation	40.0	20.0	20.0			20.0			
Block Plantation	55.6	16.7	5.6	5.6	5.6	5.6	5.6		
Total	34.7	18.1	9.7	8.3	4.2	11.1	6.9	2.8	4.2
Rourkela FC									
AJY Block Plantation			100.0						
ANR GP	29.8	14.0	28.1	21.1	1.8	5.3			
Bald Hill Plantation	50.0	25.0	25.0						
Bamboo Plantation				20.0		60.0	20.0		
Block Plantation	13.3	6.7	20.0	13.3	26.7	13.3	6.7		
CA ANR GP				20.0	60.0		20.0		
CA PCA Block Plantation	25.0		50.0	25.0					





Plant Survival Rate-FC Wise	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	>95	>93 <=95	>90 <=93	>88 <=90	>85 <=88	>80 <=85	>75 <=80	>70 <=75	<=70
CA-Safety Zone Plantation		100.0							
PCA-ANR GP	25.0		25.0	50.0					
Total	24.0	11.5	25.0	19.8	8.3	8.3	3.1		
Sambalpur FC									
ANR GP	48.6	10.8	16.2	5.4	8.1	8.1			2.7
Bamboo Plantation						40.0	60.0		
Block Plantation	43.6	17.9	25.6	10.3	2.6				
CA PCA Block Plantation	50.0	50.0							
Corridor Fodder Plantation		50.0				50.0			
Total	42.7	16.9	18.0	6.7	4.5	6.7	3.4		1.1

## 2.27 Canopy Cover:

Canopy cover normally depends upon the age of the plant, species and - soil type. It is observed in the assessment that the canopy cover varies by plantation types and year of plantation. As year of plantation varies along with plant species, canopy cover varies by forest divisions and circles. The average canopy cover in plantation sites found to be 44.68 percent whereas in silviculture sites, canopy cover observed to be 58.37 percent.

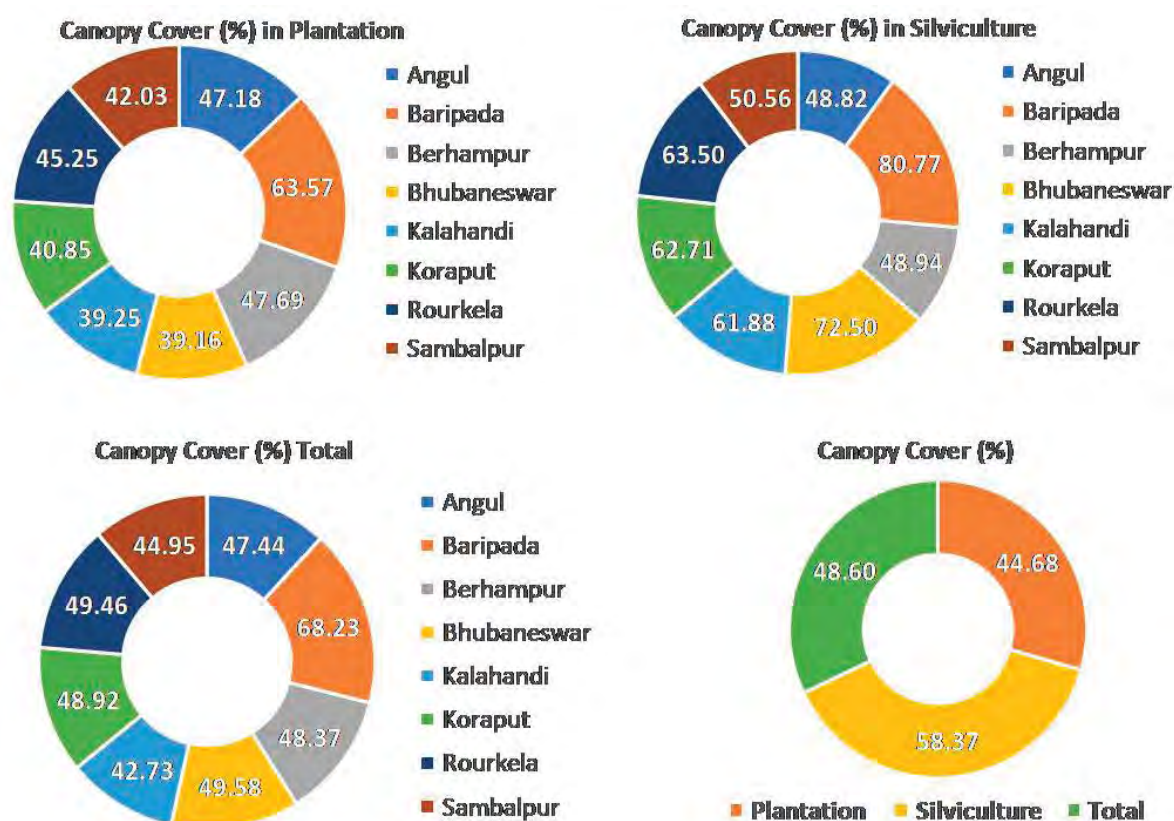


Figure 2:19: Canopy Cover in Forest Circles



Canopy cover in mangroves observed high among all the plantation categories (100.0 percent), followed by safety zone plantation (70.0 percent) and Bamboo plantation (61.67 percent). Among all the plantations, canopy covered observed low in case of avenue plantation (27.5 percent). Sites covered under silvicultural operations in many sites have better canopy cover in comparison to plantation sites. Average canopy cover observed to be highest in case of SSO timber (74.7 percent) followed by old teak management sites (70.0 percent). Canopy cover of plantation sites (by plantation category) and sites covered under silvicultural operational is presented in figures and tables.

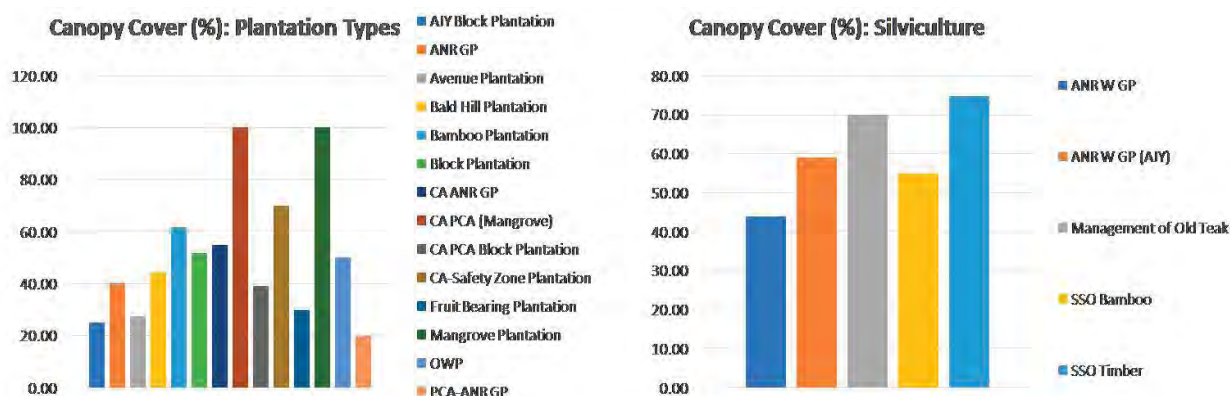


Figure 2:20: Canopy Cover in Plantation and Silviculture by FC

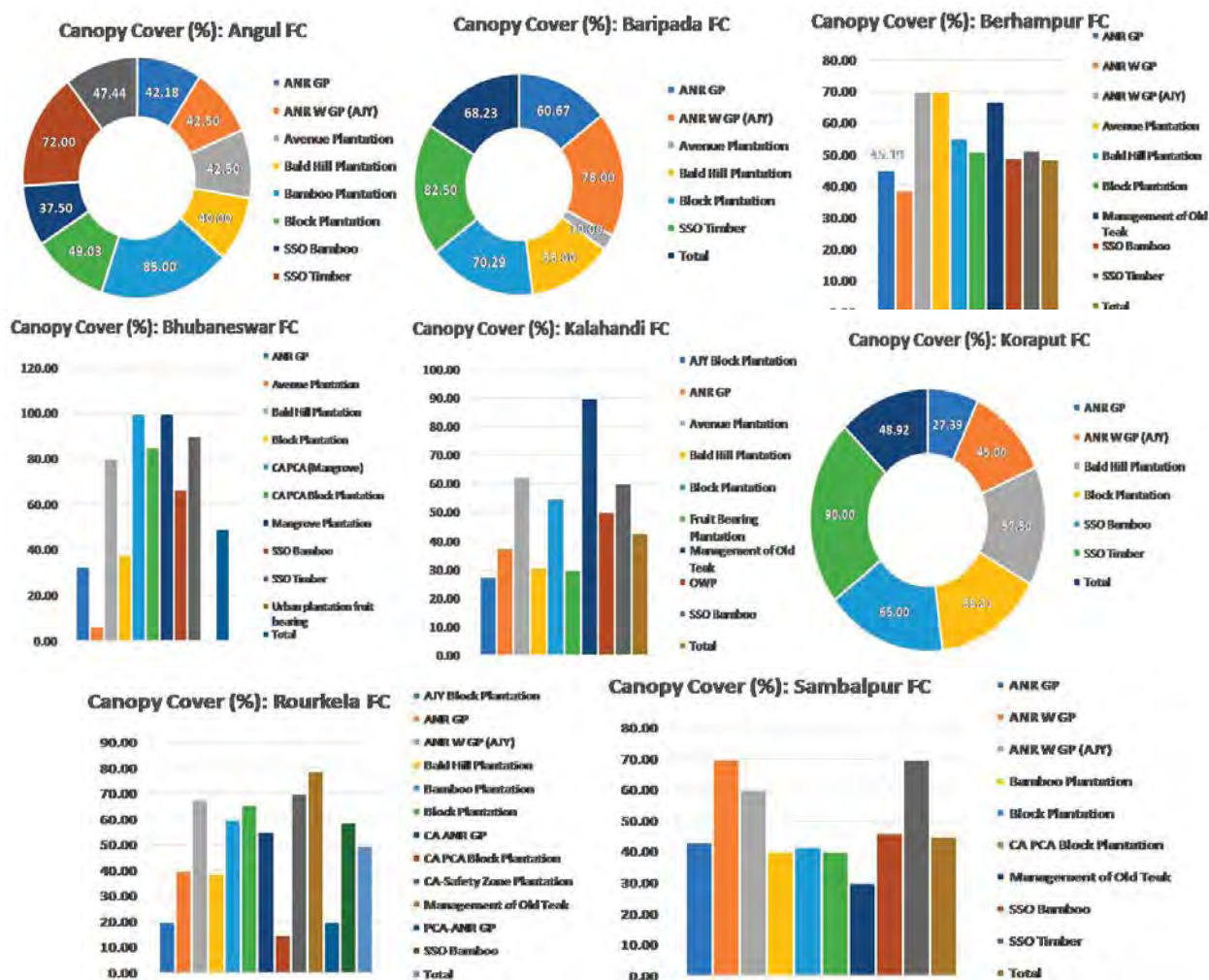
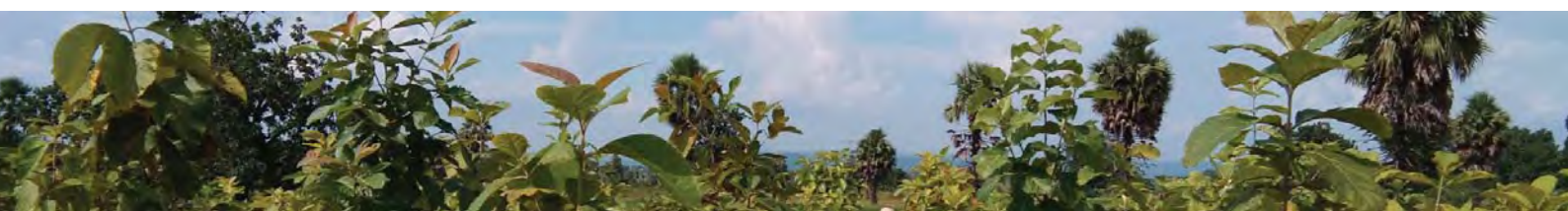


Figure 2:21: Canopy Cover by Plantation / Silviculture in Forest Circles





Irrespective of the years of plantation, highest of 33.3 percent sites have canopy cover of >10 & ≤20 percent and >80 percent in case of ANR with gap plantation. In case of bald hill plantation, 50.0 percent sites have canopy cover in the range of >20 & ≤30 percent and remaining 50.0 percent are in >70 & ≤80 percent. In case of block plantation, 23.5 percent sites have canopy cover >70 & ≤80 category and highest of 29.4 percent sites have canopy cover in the range of >80 percent. In case of silvicultural operation, canopy cover is >60 percent in all the cases. Ranking of canopy cover by plantation and silvicultural operational sites are presented in table.

Table 2.46: Canopy Cover Ranking by Plantation & Silviculture

Plantation / Silviculture	Canopy Cover (%) Ranking (% Distribution)								
	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	≤10	>10 & ≤20	>20 & ≤30	>30 & ≤40	>40 & ≤50	>50 & ≤60	>60 & ≤70	>70 & ≤80	>80
AJY Block Plantation	33.3	33.3				33.3			
ANR GP	19.1	11.0	14.9	19.5	7.8	10.6	7.8	3.2	6.0
ANR W GP	27.8			22.2		27.8	22.2		
ANR W GP (AJY)			9.4	12.5	12.5	28.1	18.8	12.5	6.3
Bald Hill Plantation	21.4		17.9	14.3	3.6	21.4		21.4	
Bamboo Plantation				33.3		33.3			33.3
Block Plantation	8.4	13.0	7.1	9.7	7.1	20.8	14.9	10.4	8.4
CA ANR GP						100.0			
CA PCA (Mangrove)									100.0
CA PCA Block Plantation	20.0	10.0		50.0				10.0	10.0
CA-Safety Zone Plantation							100.0		
Fruit Bearing Plantation			100.0						
Management of Old Teak			14.3		7.1		7.1	64.3	7.1
Mangrove Plantation									100.0
OWP					100.0				
PCA-ANR GP		100.0							
SSO Bamboo		8.3		15.7	28.7	24.1	13.9		9.3
SSO Timber	12.8		2.6	12.8			20.5	7.7	43.6
Urban plantation fruit bearing	100.0								
	12.6	9.3	9.0	15.6	9.7	16.6	11.2	6.6	9.4



Table 2.47: Canopy Cover (%) by Forest Circle

Forest Circle	Canopy Cover (%) Ranking (% Distribution)								
Plantation / Silviculture	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	<=10	>10 &<=20	>20 &<=30	>30 &<=40	>40 &<=50	>50 &<=60	>60 &<=70	>70 &<=80	>80
Angul									
ANR GP	13.3	11.1	8.9	22.2	15.6	8.9	13.3	6.7	
ANR W GP (AJY)				75.0	25.0				
Bald Hill Plantation				100.0					
Bamboo Plantation									100.0
Block Plantation	5.6	25.0		5.6	11.1	27.8	8.3	5.6	11.1
SSO Bamboo		50.0			12.5	37.5			
SSO Timber							40.0	60.0	
Total	7.4	16.7	4.6	16.7	12.0	16.7	10.2	7.4	8.3
Baripada									
ANR GP	40.0	20.0				8.0		12.0	20.0
ANR W GP (AJY)							60.0		40.0
<b>Bald Hill Plantation</b>			<b>50.0</b>					<b>50.0</b>	
<b>Block Plantation</b>		<b>11.8</b>				<b>17.6</b>	<b>17.6</b>	<b>23.5</b>	<b>29.4</b>
<b>SSO Timber</b>	<b>38.5</b>						<b>23.1</b>		<b>38.5</b>
<b>Total</b>	<b>25.4</b>	<b>11.1</b>	<b>1.6</b>			<b>7.9</b>	<b>14.3</b>	<b>12.7</b>	<b>27.0</b>
Berhampur									
<b>ANR GP</b>	<b>27.6</b>	<b>17.2</b>	<b>10.3</b>		<b>3.4</b>	<b>10.3</b>	<b>10.3</b>	<b>3.4</b>	<b>17.2</b>
ANR W GP	33.3			26.7		33.3	6.7	0.0	
ANR W GP (AJY)				25.0				75.0	
Bald Hill Plantation	33.3				33.3	33.3			
Block Plantation	33.3	8.3			25.0	8.3	16.7	8.3	
Management of Old Teak					33.3			66.7	
SSO Bamboo				58.8		35.3	5.9		
SSO Timber			12.5	62.5					25.0
Total	19.6	6.5	4.3	21.7	6.5	17.4	8.7	7.6	7.6
Bhubaneswar									
ANR GP	37.5	37.5							25.0
Bald Hill Plantation								100.0	
Block Plantation	7.1	50.0	7.1	7.1			14.3		14.3
CA PCA (Mangrove)									100.0





Forest Circle	Canopy Cover (%) Ranking (% Distribution)								
Plantation / Silviculture	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	<=10	>10 &<=20	>20 &<=30	>30 &<=40	>40 &<=50	>50 &<=60	>60 &<=70	>70 &<=80	>80
CA PCA Block Plantation								50.0	50.0
Mangrove Plantation									100.0
SSO Bamboo				13.3	33.3	13.3	6.7		33.3
SSO Timber									100.0
Urban plantation fruit bearing	100.0								
Total	18.8	23.4	1.6	4.7	7.8	3.1	4.7	4.7	31.3
Kalahandi									
AJY Block Plantation	50.0					50.0			
ANR GP	19.7	3.3	19.7	26.2	3.3	11.5	8.2	3.3	4.9
Bald Hill Plantation	50.0		10.0			20.0		20.0	
Block Plantation	18.2					18.2	45.5	9.1	9.1
Fruit Bearing Plantation			100.0						
Management of Old Teak									100.0
OWP					100.0				
SSO Bamboo					33.3	33.3	33.3		
Total	19.2	1.9	13.5	15.4	7.7	17.3	15.4	4.8	4.8
Koraput									
ANR GP	13.0	26.1	34.8	26.1					
ANR W GP (AJY)			33.3		33.3	33.3			
Bald Hill Plantation			25.0			50.0		25.0	
Block Plantation		7.1		21.4		42.9	7.1	14.3	7.1
SSO Bamboo						50.0	50.0		
SSO Timber									100.0
Total	4.6	10.8	18.5	13.8	4.6	24.6	9.2	4.6	9.2
Rourkela									
AJY Block Plantation		100.0							
ANR GP	12.3		15.8	26.3	21.1	24.6			
ANR W GP (AJY)						33.3	50.0	16.7	
Bald Hill Plantation			50.0	25.0		25.0			



Forest Circle Plantation / Silviculture	Canopy Cover (%) Ranking (% Distribution)								
	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	<=10	>10 &<=20	>20 &<=30	>30 &<=40	>40 &<=50	>50 &<=60	>60 &<=70	>70 &<=80	>80
Bamboo Plantation						100.0			
Block Plantation			13.3			6.7	46.7	33.3	
CA ANR GP						100.0			
CA PCA Block Plantation	50.0	25.0		25.0					
CA-Safety Zone Plantation							100.0		
Management of Old Teak							12.5	87.5	
PCA-ANR GP		100.0							
SSO Bamboo				25.0	25.0	25.0			25.0
Total	6.9	4.6	10.0	16.9	13.1	25.4	9.2	10.0	3.8
Sambalpur									
ANR GP	7.7	7.7	23.1	30.8			30.8		
ANR W GP							100.0		
ANR W GP (AJY)						100.0			
Bamboo Plantation				100.0					
Block Plantation	11.4		22.9	25.7	11.4	25.7		2.9	
CA PCA Block Plantation				100.0					
Management of Old Teak			100.0						
SSO Bamboo		21.7			65.2		13.0		
SSO Timber							100.0		
<b>Total</b>	<b>5.7</b>	<b>6.7</b>	<b>15.2</b>	<b>24.8</b>	<b>18.1</b>	<b>12.4</b>	<b>16.2</b>	<b>1.0</b>	

## 2.28 Display of Plantation Sites:

Pillars have been installed in different plantation sites and sites covered under silvicultural operations across the forest divisions in studied circles. No. of pillars have been erected based on the plantation / silviculture area. Average number of pillars in areas under plantation is more or less same to that of pillars in the silvicultural sites. About 81.7 percent plantation sites and 31.3 percent sites covered under silvicultural operations found having pillars. Average number of pillars installed by plantation and silvicultural sites in different forest circles are presented in the figure.





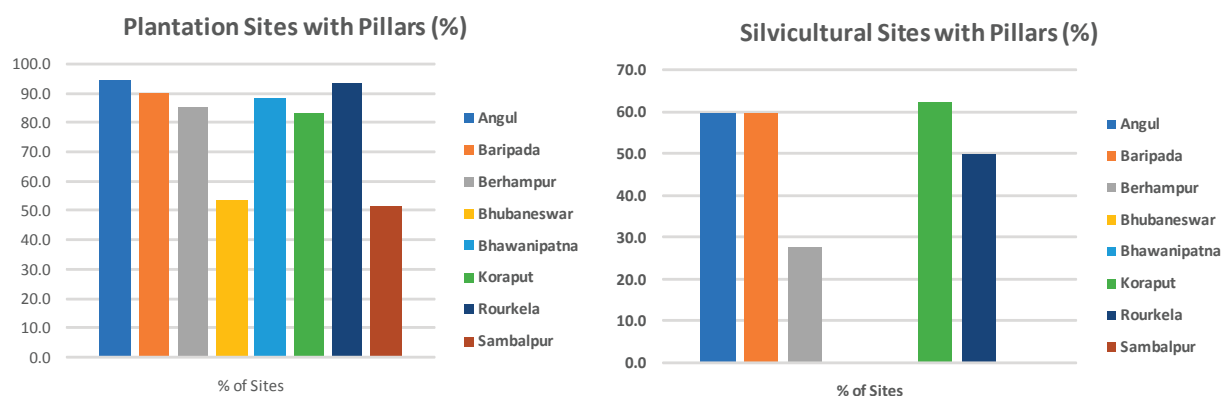
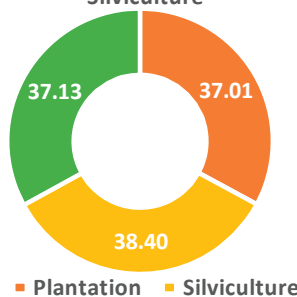
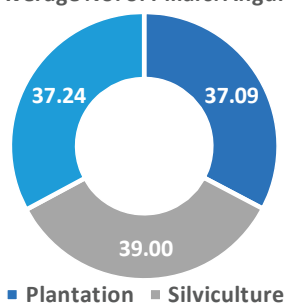


Figure 2:22: Installation of Pillars by Plantation / Silviculture Sites

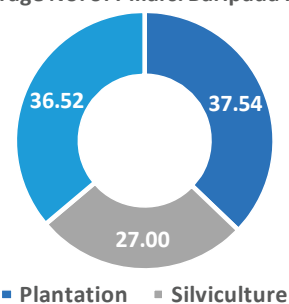
Average No. of Pillars: Plantation &amp; Silviculture



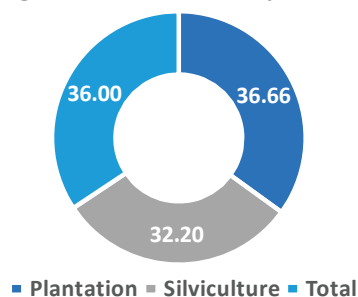
Average No. of Pillars: Angul FC



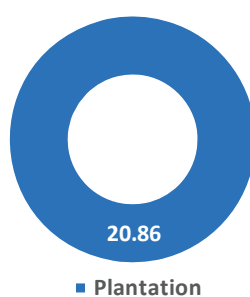
Average No. of Pillars: Baripada FC



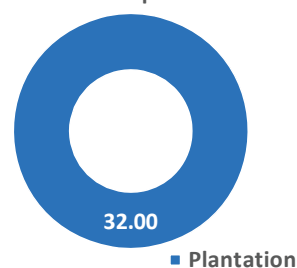
Average No. of Pillars: Berhampur FC



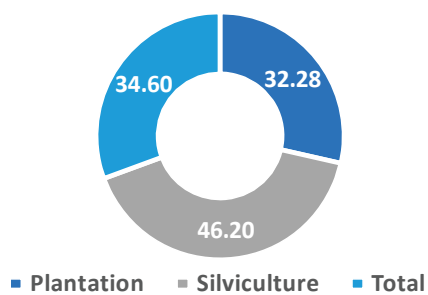
Average No. of Pillars: Bhubaneswar FC



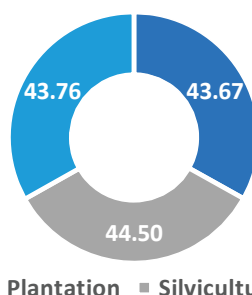
Average No. of Pillars: Bhawanipatna FC



Average No. of Pillars: Koraput FC



Average No. of Pillars: Rourkela FC



Average No. of Pillars: Sambalpur FC

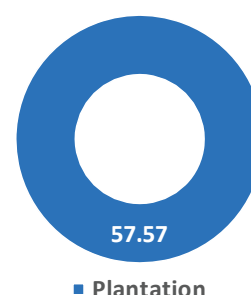


Figure 2:23: Pillars in Forest Circles



During assessment, sign boards are observed installed near the plantation / silviculture sites. About 73.3 percent plantation sites and 49.2 percent silvicultural sites found having sign board which highlights the plantation / silvicultural details.

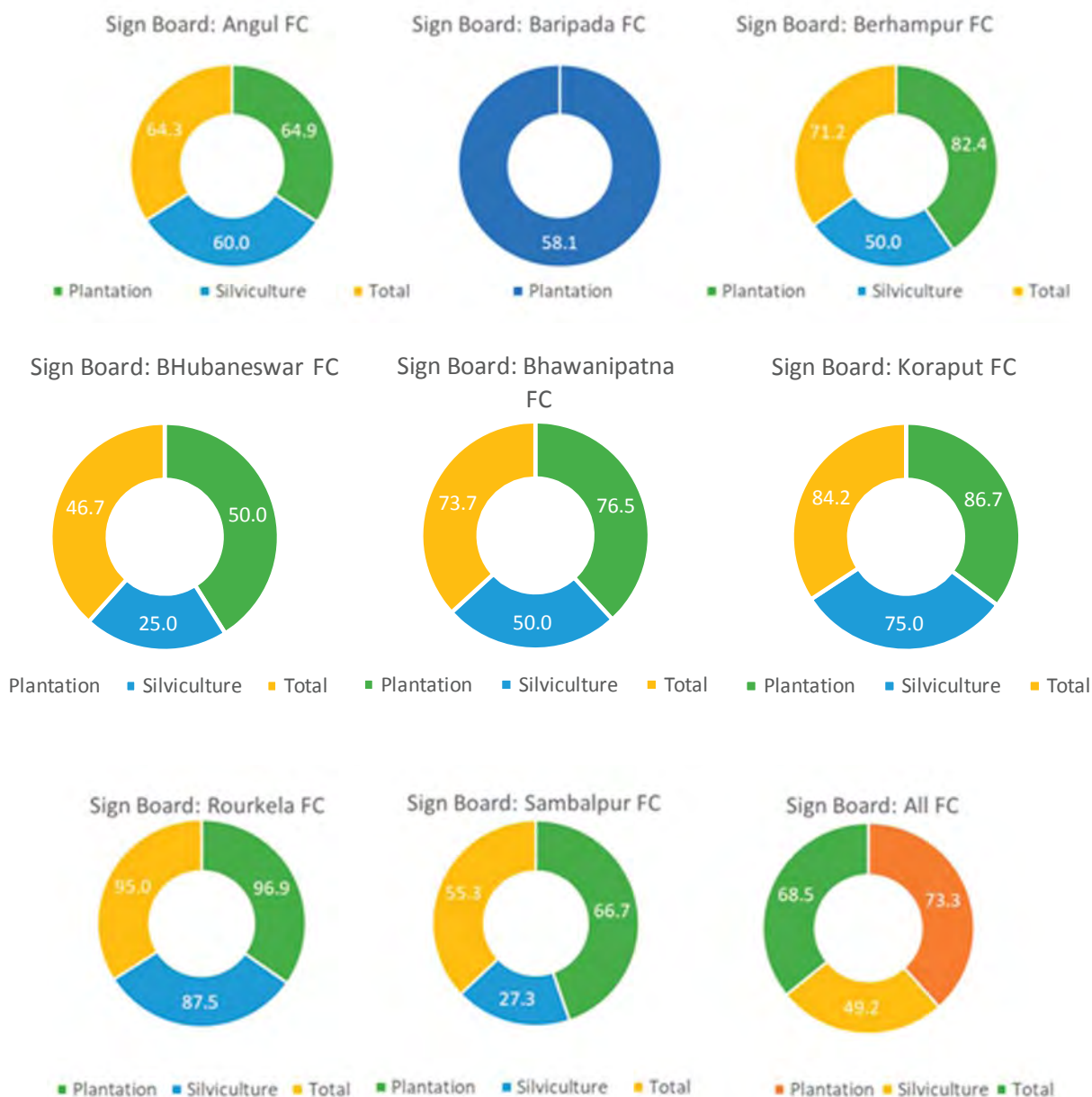


Figure 2:24: Sign Boards in Forest Circles

## 2.29 Soil and Moisture Conservation (SMC) Measures:

Different soil moisture conservation measures have been taken under CAMPA in both plantation sites and area under silvicultural operations. Different SMC works have been taken up based on its locational suitability and assessed requirements. Soil moisture conservation measures taken up are like staggered trench, half-moon trench, LBCD, check dam structure etc.





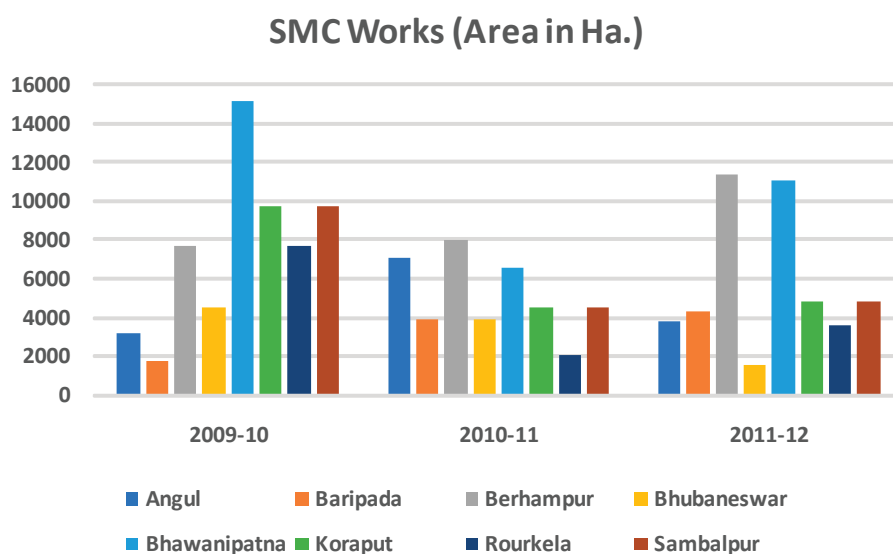


Figure 2:25: SMC Works in Different Years by Forest Circle

Source: Forest & Environment Dept.

Different SMC works have been taken up in plantation / silviculture sites with emphasis on staggered trench (58.9 percent sites), followed by LBCD structures (24.8 percent sites) and half-moon trench (15.0 percent sites). Contour bunding and percolation pits have also been taken up in some sites. In Angul, 78.6 percent sites having SMC structures, 83.3 percent sites in Baripada and 43.3 percent sites in Bhubaneswar are having SMC structures of different kinds. In the remaining forest circles, i.e., Berhampur, Kalahandi, Koraput, Rourkela and Sambalpur have SMC works in almost all the sites or multiple SMC works in different sites.

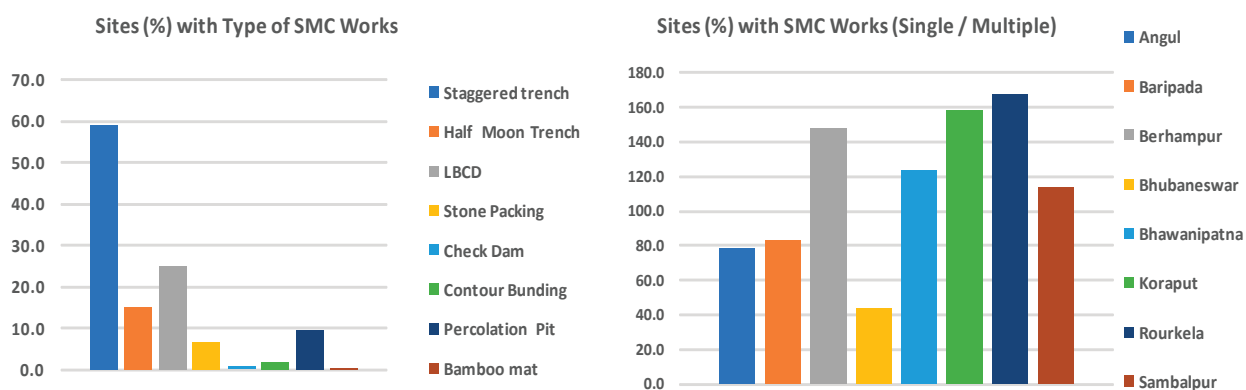


Figure 2:26: SMC Works by Forest Circle

There are about 38.2 sites (both plantation and silviculture) where single SMC work taken up whereas 37.3 percent sites have more than one SMC works (32.2 percent sites having two and 5.1 percent site having more than 2 SMC works). In plantation sites, 41.4 percent sites have single SMC work whereas 31.5 percent sites have more than one SMC works. In silvicultural sites, 25.4 percent sites have single and 60.3 percent sites have more than one SMC works. SMC works (single / multiple) by forest circle is presented in the figure.



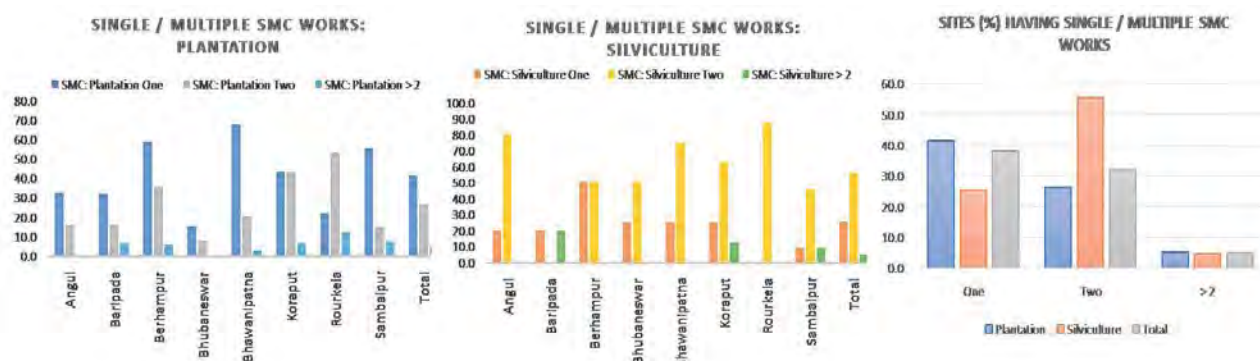


Figure 2:27: Single / Multiple SMC Works by Forest Circle

Table 2.48: Single / Multiple SMC Works by Plantation / Silvicultural Sites

Circle	Particulars	Single / Multiple SMC Works (% of Sites)			
		Single SMC Work	Two SMC Works	More than 2 SMC Works	Total
Angul	Plantation	32.4	16.2		48.6
	Silviculture	20.0	80.0		100.0
	Total	31.0	23.8		54.8
Baripada	Plantation	32.3	16.1	6.5	54.8
	Silviculture	20.0		20.0	40.0
	Total	30.6	13.9	8.3	52.8
Berhampur	Plantation	58.8	35.3	5.9	100.0
	Silviculture	50.0	50.0		100.0
	Total	55.8	40.4	3.8	100.0
Bhubaneswar	Plantation	15.4	7.7		23.1
	Silviculture	25.0	50.0		75.0
	Total	16.7	13.3		30.0
Kalahandi	Plantation	67.6	20.6	2.9	91.2
	Silviculture	25.0	75.0		100.0
	Total	63.2	26.3	2.6	92.1
Koraput	Plantation	43.3	43.3	6.7	93.3
	Silviculture	25.0	62.5	12.5	100.0
	Total	39.5	47.4	7.9	94.7
Rourkela	Plantation	21.9	53.1	12.5	87.5
	Silviculture		87.5		87.5
	Total	17.5	60.0	10.0	87.5
Sambalpur	Plantation	55.6	14.8	7.4	77.8
	Silviculture	9.1	45.5	9.1	63.6
	Total	42.1	23.7	7.9	73.7
Total	Plantation	41.4	26.3	5.2	72.9
	Silviculture	25.4	55.6	4.8	85.7
	Total	38.2	32.2	5.1	75.5



## 2.30 Plant Height and GBH/GCH:

Height and girth of the plants of different species were measured to understand the growth factor. Growth of the plant by height and girth also represents the cultural practices and measures taken for ensuring appropriate nurturing of the plantation sites. The mean maximum height of the plants, irrespective of the year of plantation, location, type of plantation and plant species, calculated to be 4.9 mt. The mean minimum height of the plants at the circle level found to be 2.7 mt. for the plantation sites. Similarly, mean maximum GBH/GCH has been 21.2 cm and mean minimum GBH/GCH has been 11.0 cm (excluding bamboo plantation).

In silviculture, mean maximum height of the plants measured to be 16.9 mt. and mean minimum height found to be 14.2 mt. The mean maximum GBH/GCH of the plans observed to be 114.4 cm. and mean minimum GBH/GCH observed to be 86.4 cm.

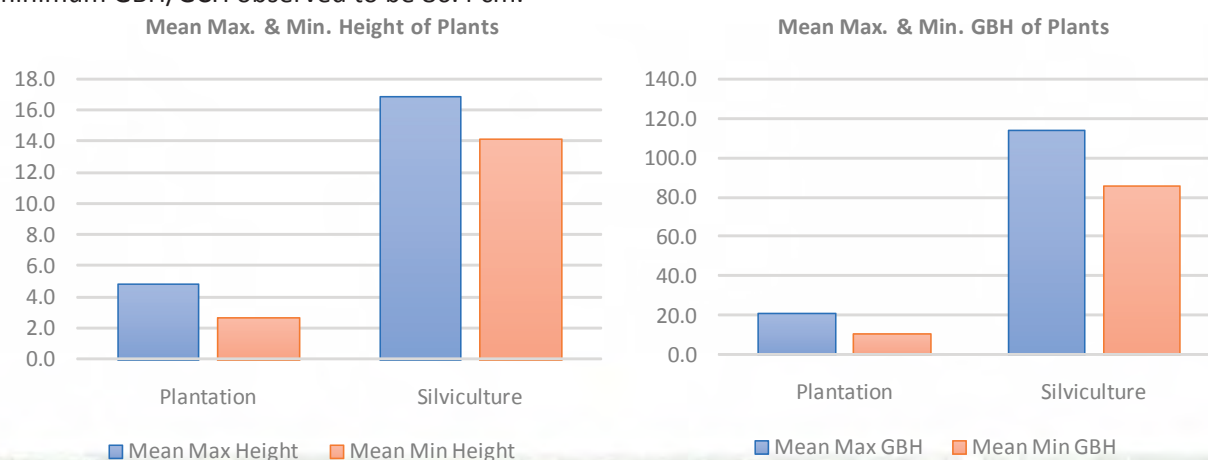


Figure 2:28: Mean Height and GBH/GCH of Plants





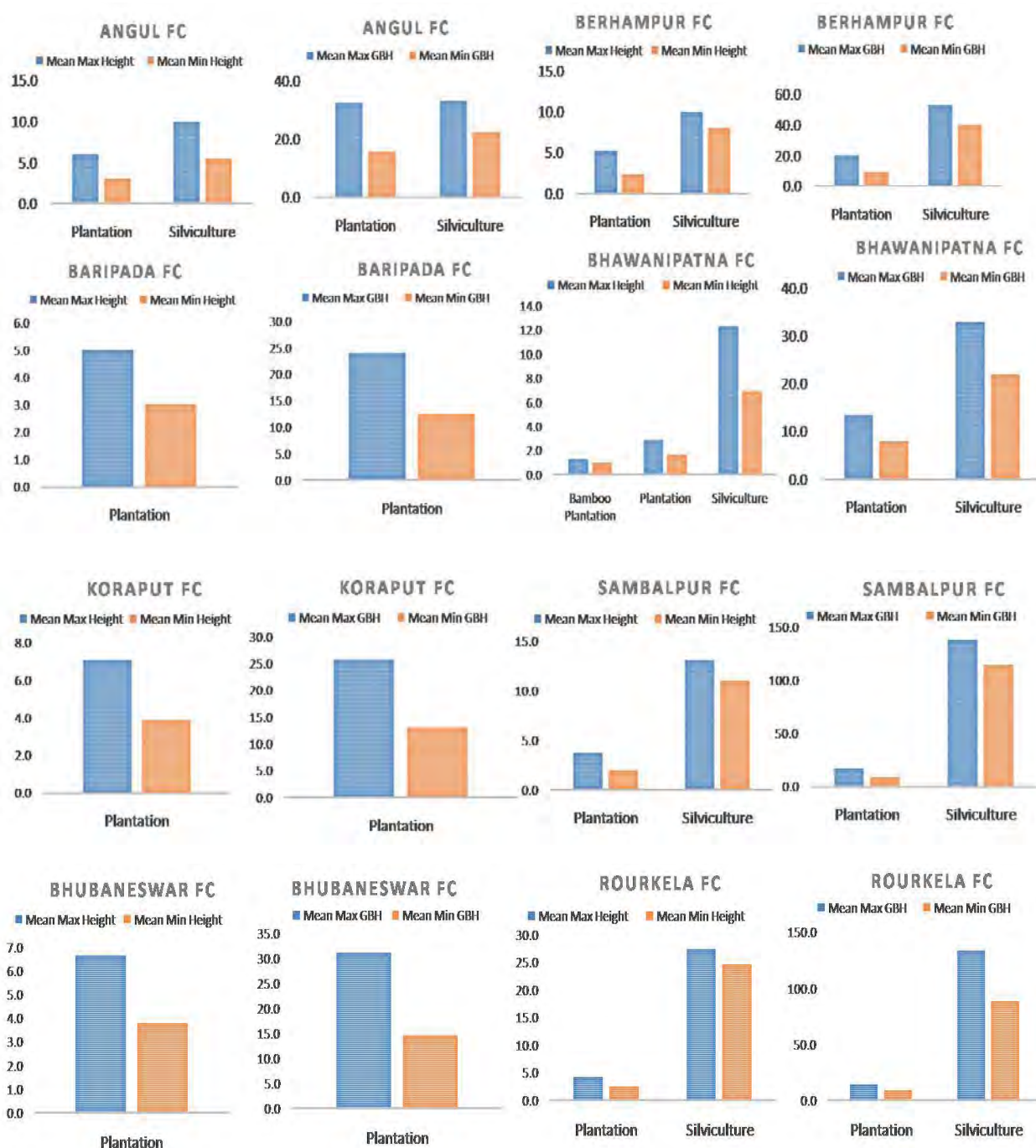
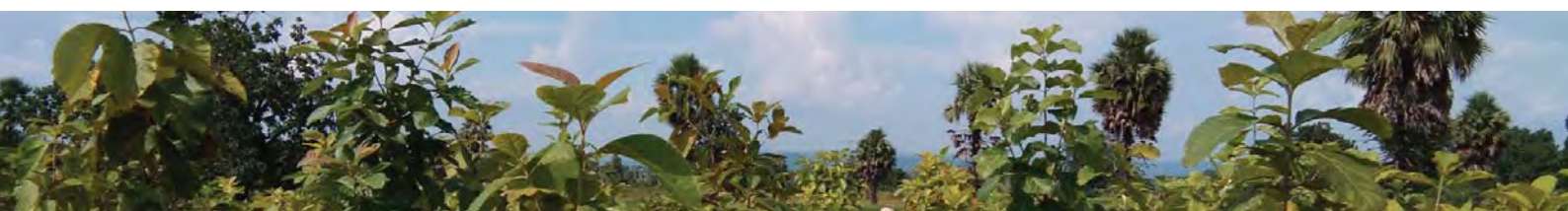


Figure 2:29: Height and GBH/GCH of Plants at Forest Circle

Height and girth of the plants by forest circle reflects that, irrespective of age of plantation and plant species, mean maximum height of the plants in plantation category is highest in Koraput circle (7.1 mt.) followed by Angul (6.0 mt.) and lowest in Kalahandi (2.9 mt.). Similar trend is observed in case of mean minimum height, where Koraput is highest with 3.9 mt. and Kalahandi is lowest with 1.7 mt. Besides, in case of mean maximum and mean minimum GBH/GCH, Angul is the highest among all the forest circles (32.2 cm.). The mean maximum and mean minimum height of the plants planted under different plantation works and its GBH/GCH is presented in diagram and matrix.





Irrespective of the site and plant species, the plants those were planted in the year 2009-10, is having mean maximum height of 8.3 mt. and mean minimum height of 4.9 mt. The mean maximum and mean minimum GBH/GCH of the plants measured to be 39.1 cm. and 19.4 cm. respectively. The mean maximum and minimum height of the plants, planted in the year 2009-10 is highest among all the plantations taken up in successive years, excluding some plantation types, specifically in bald hill plantation where height of the plant is relatively higher than 2009-10 plantation.



Figure 2:30: Mean Max. & Min. Height and GBH/GCH of Plants by Forest Circle

It is observed during assessment that there is difference in height and girth of the plants by species, apart from year of plantation and type of plantation. Plant species like *Acacia auriculiformis*, *Krushnachuda* and *Radhachuda* found higher growth in comparison to many other plants. Plant specific height (in mt.) and



GBH/GCH (in cm.) of the plants along with year of plantation is discussed in circle specific sections. Height and GBH/GCH of the plant species also differ by type of plantation, apart from year of plantation. Height and GBH/GCH of the plant species by plantation / silviculture category is presented in the matrix below.

*Table 2.49: Mean Max. & Min. Height and GBH/GCH of Plants by Plantation Groups*

Plantation Category	Mean Max Height	Mean Min Height	Mean Max GBH/GCH	Mean Min GBH/GCH
Bamboo Plantation				
ANR GP (Bamboo)	1.3	1.0	-	-
Plantation				
AJY Block plantation	2.2	1.5	10.1	6.4
ANR GP	3.9	1.9	15.2	7.9
Avenue Plantation	6.6	4.3	38.4	24.3
Bald Hill Plantation	5.0	3.0	21.7	11.8
Bamboo Plantation	1.0	0.7	-	-
Block Plantation	7.7	4.5	34.8	17.1
CA ANR GP	3.7	2.6	16.1	11.3
CA Block Plantation	3.7	2.7	21.4	11.4
CA PCA Block Plantation	2.9	1.5	15.6	7.0
CA- PCA (Mangrove)	6.1	3.8	26.5	14.1
CA-Safety Zone Plantation	4.4	3.1	14.7	4.3
Corridor Fodder Plantation	1.2	1.0	4.3	3.3
Fruit Bearing Plantation	2.1	0.8	6.3	3.3
Management of Old Teak	6.2	4.5	46.5	16.5
OWP	5.0	2.0	26.7	7.7
PCA-ANR GP	1.6	1.2	7.5	5.6
Urban plantation fruit bearing	1.8	1.0	13.4	
Total	4.9	2.7	21.2	11.0
Silviculture				
Management of Old Teak	23.4	20.4	111.1	74.1
SSO Bamboo	1.0	1.0		
SSO Timber	14.9	11.9	117.1	96.2
Total	16.9	14.2	114.4	86.4





Table 2.50: Ranking of Mean Max. Plant Height by Plantation Groups

Particulars	Ranking of Mean Max. Plant Height (Mt.) (% Distribution of Sites)								
	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	<=2	>2 <=5	>5 <=8	>8 <=11	>11 <=14	>14 <=17	>17 <=20	>20 <=25	>25
Bamboo Plantation									
ANR GP (Bamboo)	100.0								
Plantation									
AJY Block plantation	53.3	46.7							
ANR GP	30.3	49.2	14.1	2.9	1.1	0.4			2.1
Avenue Plantation	2.0	38.8	32.7	22.4	2.0	2.0			
Bald Hill Plantation	24.7	38.4	17.8	9.6	8.2	1.4			
Bamboo Plantation	100.0								
Block Plantation	5.6	29.9	28.3	19.0	8.9	4.9	2.0	0.9	0.4
CA ANR GP	40.0	16.7	43.3						
CA Block Plantation		100.0							
CA PCA Block Plantation	56.4	30.8	10.3	2.6					
CA-Safety Zone Plantation		66.7	33.3						
Corridor Fodder Plantation	100.0								
Fruit Bearing Plantation	50.0	50.0							
OWP		66.7	33.3						
PCA-ANR GP	76.9	23.1							
Urban plantation	75.0	25.0							
<b>Total</b>	<b>25.7</b>	<b>41.9</b>	<b>18.1</b>	<b>7.5</b>	<b>3.4</b>	<b>1.5</b>	<b>0.5</b>	<b>0.2</b>	<b>1.3</b>



Table 2.51: Ranking of Mean Min. Plant Height by Plantation Groups

Particulars	Ranking of Mean Min. Plant Height (Mt.) (% Distribution of Sites)								
	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	<=2	>2 <=5	>5 <=8	>8 <=11	>11 <=14	>14 <=17	>17 <=20	>20 <=25	>25
Bamboo Plantation									
ANR GP (Bamboo)	100.0								
Plantation									
AJY Block plantation	73.3	26.7							
ANR GP	71.0	23.1	3.0	0.7	0.0				2.2
Avenue Plantation	26.5	44.9	22.4	4.1	2.0				
Bald Hill Plantation	52.7	31.5	10.3	4.8	0.7				
Bamboo Plantation	100.0								
Block Plantation	28.3	42.9	18.3	5.8	2.2	0.4	1.1	0.4	0.4
CA ANR GP	50.0	50.0							
CA Block Plantation	20.0	80.0							
CA PCA Block Plantation	82.1	17.9							
CA-Safety Zone Plantation		100.0							
Corridor Fodder Plantation	100.0								
Fruit Bearing Plantation	100.0								
OWP	66.7	33.3							
PCA-ANR GP	92.3	7.7							
Urban plantation fruit bearing	100.0								
<b>Total</b>	<b>59.0</b>	<b>28.9</b>	<b>7.4</b>	<b>2.2</b>	<b>0.6</b>	<b>0.1</b>	<b>0.3</b>	<b>0.1</b>	<b>1.4</b>





Table 2.52: Ranking of Mean Max. Plant GBH/GCH by Plantation Groups

Particulars	Ranking of Mean Max. Plant GBH/GCH (Cm.) (% Distribution of Sites)								
	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	<=5	>5 <=10	>10 <=20	>20 <=30	>30 <=45	>45 <=60	>60 <=80	>80 <=100	>100
Bamboo Plantation									
ANR GP (Bamboo)	100								
Plantation									
AJY Block plantation	13.3	66.7	20.0						
ANR GP	18.5	24.0	36.5	13.4	4.5	0.9	0.3		1.9
Avenue Plantation		2.0	6.1	40.8	24.5	10.2	12.2	4.1	
Bald Hill Plantation	11.0	21.9	26.7	18.5	15.1	6.8			
Bamboo Plantation	100								
Block Plantation	5.1	5.6	18.8	17.2	30.8	13.4	7.4	1.8	
CA ANR GP	13.3	33.3	10.0	36.7	6.7				
CA Block Plantation			40.0	60.0					
CA PCA Block Plantation	15.4	53.8	15.4	7.7			7.7		
CA-Safety Zone Plantation			100.0						
Corridor Fodder Plantation	100								
Fruit Bearing Plantation	25.0	75.0							
OWP			33.3	33.3	33.3				
PCA-ANR GP	15.4	76.9	7.7						
Urban plantation fruit bearing	50.0		50.0						
<b>Total</b>	<b>15.4</b>	<b>20.0</b>	<b>29.2</b>	<b>15.3</b>	<b>11.7</b>	<b>4.4</b>	<b>2.3</b>	<b>0.5</b>	<b>1.1</b>



Table 2.53: Ranking of Mean Max. Plant GBH/GCH by Plantation Groups

Particulars	Ranking of Mean Min. Plant GBH/GCH (Cm.) (% Distribution of Sites)							
	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.9
	<=5	>5 <=10	>10 <=20	>20 <=30	>30 <=45	>45 <=60	>60 <=80	>100
Bamboo Plantation								
ANR GP (Bamboo)	100.0							
Plantation								
AJY Block plantation	60.0	33.3	6.7					
ANR GP	44.3	36.2	14.7	2.7	0.2			1.8
Avenue Plantation	12.2	12.2	34.7	18.4	8.2	10.2	4.1	
Bald Hill Plantation	30.8	29.5	29.5	7.5	2.7			
Bamboo Plantation	100.0							
Block Plantation	11.8	19.9	37.9	19.2	8.7	1.1	0.2	1.1
CA ANR GP	50.0	6.7	26.7	16.7				
CA Block Plantation		20.0	80.0					
CA PCA Block Plantation	64.1	23.1	7.7	5.1				
CA-Safety Zone Plantation	33.3	66.7						
Corridor Fodder Plantation	100.0							
Fruit Bearing Plantation	100.0							
OWP	33.3	66.7						
PCA-ANR GP	69.2	30.8						
Urban plantation fruit bearing	100.0							
<b>Total</b>	<b>36.7</b>	<b>29.8</b>	<b>21.5</b>	<b>7.5</b>	<b>2.5</b>	<b>0.5</b>	<b>0.2</b>	<b>1.3</b>

### 2.31 Plant Protection Measures:

Different plant protection measures have been taken in all the forest divisions to improve plant survival rate. Plant protection measures taken are like fencing, fire protection measures, watch and ward etc. In certain cases, villages and VSS have been found taking care of the local forest area and plantation sites. At the circle level, covering all the forest divisions, it is found that high emphasis is given to watch and ward among all the protection measures. For old plantations (like plantation of 2009-10), watch and ward provision was made for three years excluding the plantation year. In the later stage, the site was covered under general monitoring and supervision. But for the plantations taken up in 2016-17 and 2017-18, watch and ward observed at the site level. In specific cases, fire protection measures have also been taken.





## 2.32 Record Keeping and Documentation:

Different records / documents are maintained at the range office level with respect to plantation / silvicultural activities, such as plantation journal, plantation site map, treatment map and other registers. Plantation journal is observed for 96.0 percent plantation sites, covering all the forest circles. Journal for plantation activities found for all the sites in case of Berhampur forest circle, Bhubaneswar and Sambalpur forest circles. Of the available plantation journals, 97.6 percent were found to be fully prepared. About 90.8 percent sites, across different forest circles, have map of plantation sites where Sambalpur is having map for all the plantation sites.

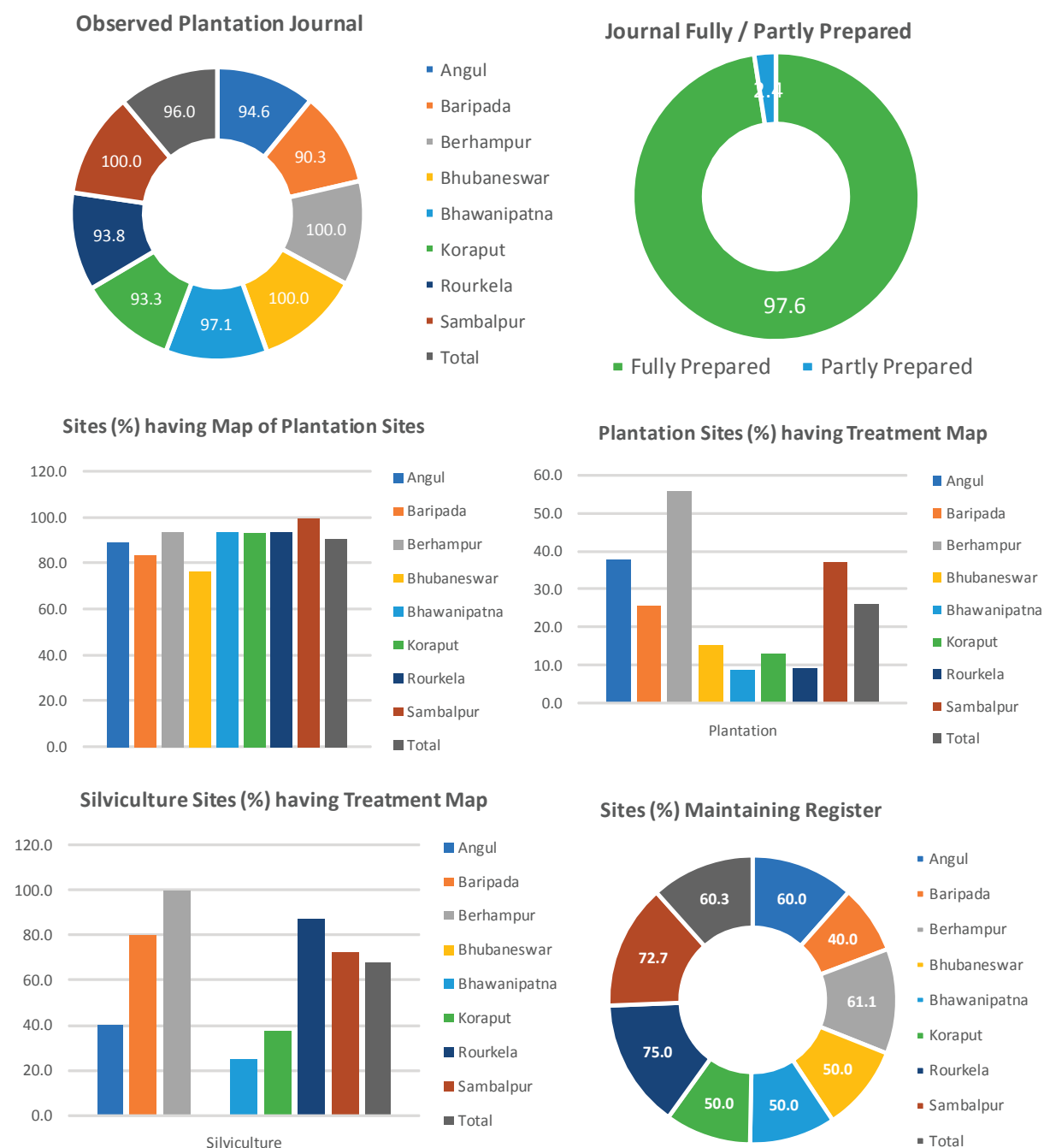


Figure 2:31: Different Records Maintained





Micro plan is found not prepared, excluding sites covered under AJY. Treatment map observed for 25.9 percent plantation sites and 68.3 percent sites covered under silvicultural operations. In Berhampur circle, all the sites covered under silvicultural operations have treatment maps. Details are presented in the diagram-2.30.







## CHAPTER - III







### 3. Evidence of CAMPA Intervention of Angul Circle

#### 3.1 Introduction:

Angul forest circle is primarily spread over seven districts, namely Angul, Cuttack, Dhenkanal, Jagatsingpur, Jajpur, Kendrapara and Nayagarh. About 29.0 percent (7,500.03 sq. km.) of the total geographical area (25,860 sq. km.) of these districts is covered under forest<sup>18</sup> (forest of different classifications). The districts witness a positive change in the forest cover area, in comparison to 2017 assessment. Very Dense Forest (VDF) is about 3.39 percent (876.4 sq. km.) of the total geographical area and 11.69 percent of the total forest area of the districts. Moderately Dense Forest (MDF) (3,156.55 sq. km.) is 42.09 percent of the total forest area and 12.21 percent of the total geographical area of the districts in combination. Open forest is higher than the moderately dense forest in the districts (combine), i.e., 46.23 percent (3,467.08 sq. km.) of the total forest area and 13.41 percent of the total geographical area. The Angul forest circle is having seven forest divisions, i.e., (1) Angul, (2) Athagarh, (3) Athamallik, (4) Cuttack, (5) Dhenkanal, (6) Mahanadi WL and (7) Satakosia WL.

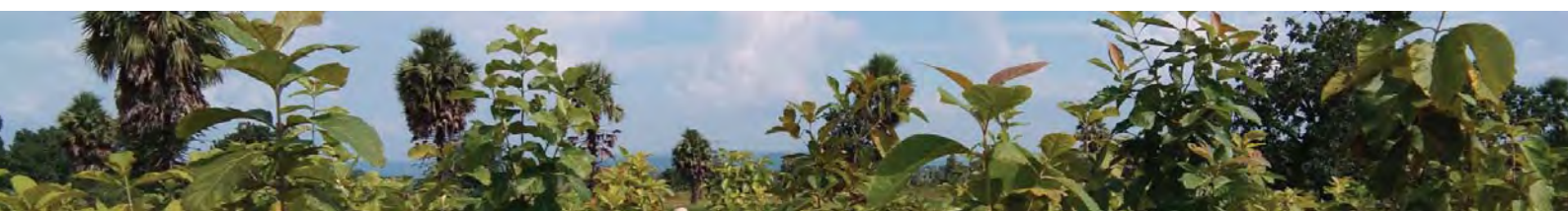
Table 3.1: Forest Area in Different Districts of the Circle

District	Geographical Area (GA) (in Sq. Km.)	2019 Assessment (in Sq. Km.)				% of GA	Change w.r.t 2017 Assessment
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total		
Anugul	6,375	371.01	1,380.00	1,031.62	2,782.63	43.65	27.63
Cuttack	3,932	53	226	525.38	804.38	20.46	8.38
Dhenkanal	4,452	173.99	420.38	851.24	1,445.61	32.47	28.61
Jagatsinghapur	1,668	0	4.64	131.64	136.28	8.17	0.28
Jajapur	2,899	6	71.99	228.09	306.08	10.56	3.08
Kendrapara	2,644	83.4	88.54	139.36	311.3	11.77	6.3
Nayagarh	3,890	189	965	559.75	1,713.75	44.06	3.75
Grand Total	25,860	876.4	3,156.55	3,467.08	7,500.03	29.0	

Source: ISFR, 2019

The district of Angul is having geographical area of 6,375 sq. km. of which 371.01 sq. km (5.82 percent of GA) is under very dense forest category, 1,380.00 sq. km. (21.65 percent of GA) is moderately dense forest and 1,031.62 sq. km (16.18 percent of GA) is open forest. Total forest area in the district is 43.65 percent of the total geographical area. There is a positive change in forest cover in the district, by 27.63 sq. km. in comparison to 2017 assessment. The total geographical area of Cuttack district is 3,932 sq. km. of which 53 sq. km. (1.35 percent) is under very dense forest, 226 sq. km (5.75 percent of the GA) is moderately dense forest and 525.38 sq. km (13.36 percent of GA) is open forest. Total forest area in the district is 804.38 sq. km. Total forest area to the geographical area of the district is 20.46 percent which shows an increasing trend by 8.38 sq. km. in comparison to 2017 assessment. Different districts covered under the forest circle and their forest coverage is presented in the table.

<sup>18</sup> ISFR, 2019



### 3.2 Plantation Activities:

Key plantation activities those have been taken up in the circle are block plantation, ANR with enrichment planting, bald hill plantation and avenue plantation. Block plantation was taken up in the year 2009-10, covering a total area of 3,605.0 ha. ANR with gap plantation covered a total area of 4,740 ha. in 2014-15, 10,800 ha. in 2015-16 and 8,700 ha. in 2016-17. Bamboo plantation taken up in Dhenkanal in the year 2014-15 covering a total area of 1,500 ha. Under CA-PCA, different area covered in forest divisions, excluding Mahanadi WL. In bald hill plantation, Angul and Cuttack were covered in the year 2012-13 and 2015-16. Area coverage details are presented in the figures below.

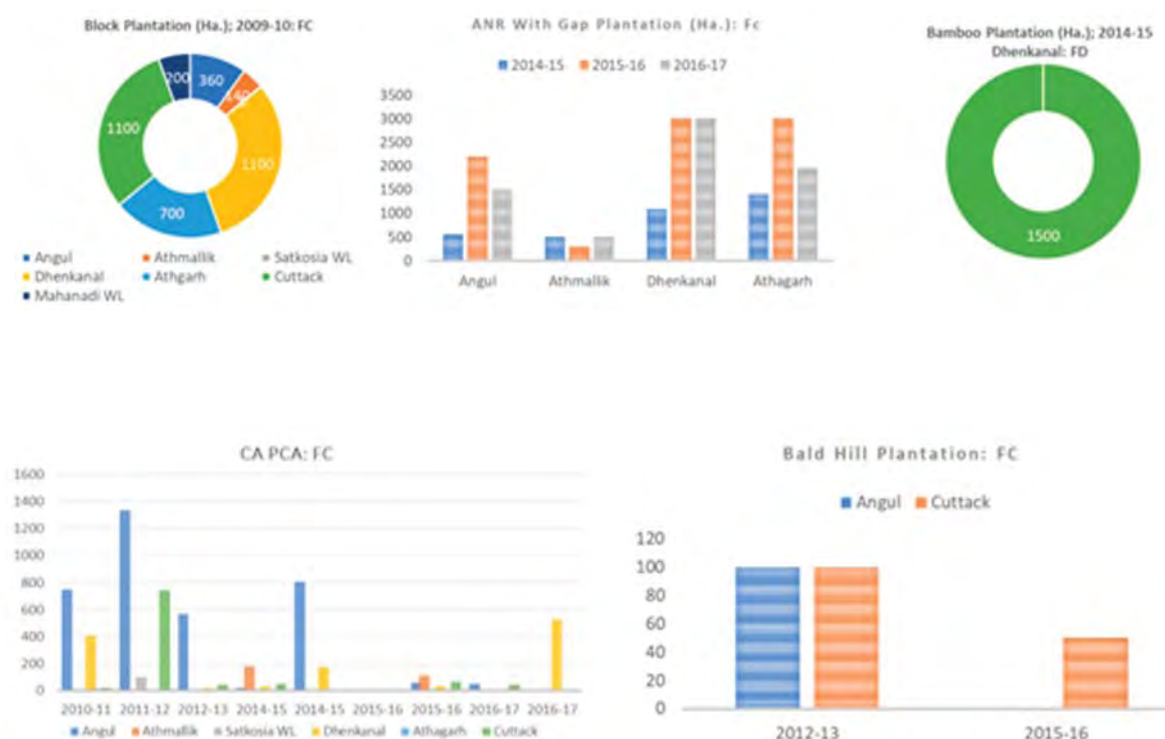


Figure 3.1: Plantation Activities  
Source: Forest & Environment Dept.

### 3.3 CRM and Silvicultural Operation:

Under CRM and silvicultural operations, activities taken up are like SSO-Bamboo, ANR without Gap plantation, SSO Timber and management of old Teak plants. Apart from these, silvicultural operations / maintenance works were taken up for the area covered under plantation in different years, along with replacement for dead plants. ANR without gap plantation covered a total area of 5,878.93 ha. in 2009-10, 7,194.5 ha. in 2010-11 and 3,920.7 ha. in 2011-12. Silvicultural operations in timber was taken up in the year 2013-14 in 10,218.64 ha. and in 10,746 ha. in 2014-15. Coverage of area under CRM and silvicultural operation under different categories are presented in the figure-3.2.







Figure 3:2: CRM &amp; Silvicultural Operations

Source: Forest &amp; Environment Dept.

### 3.4 Study Coverage:

The study covered all the seven forest divisions of the circle under different components of CAMPA. The forest divisions covered are (1) Angul, (2) Athagarh, (3) Athamallik, (4) Cuttack, (5) Dhenkanal, (6) Mahanadi WL and (7) Satakosa WL. Under the forest divisions, 21 ranges were covered under the study. Details are presented in the figure. Under plantation and silvicultural operation component, the study covered 108 plots from 42 sites in 7 forest divisions, 21 forest ranges, 30 forest sections and 36 forest beats of the circle to understand CAMPA interventions.

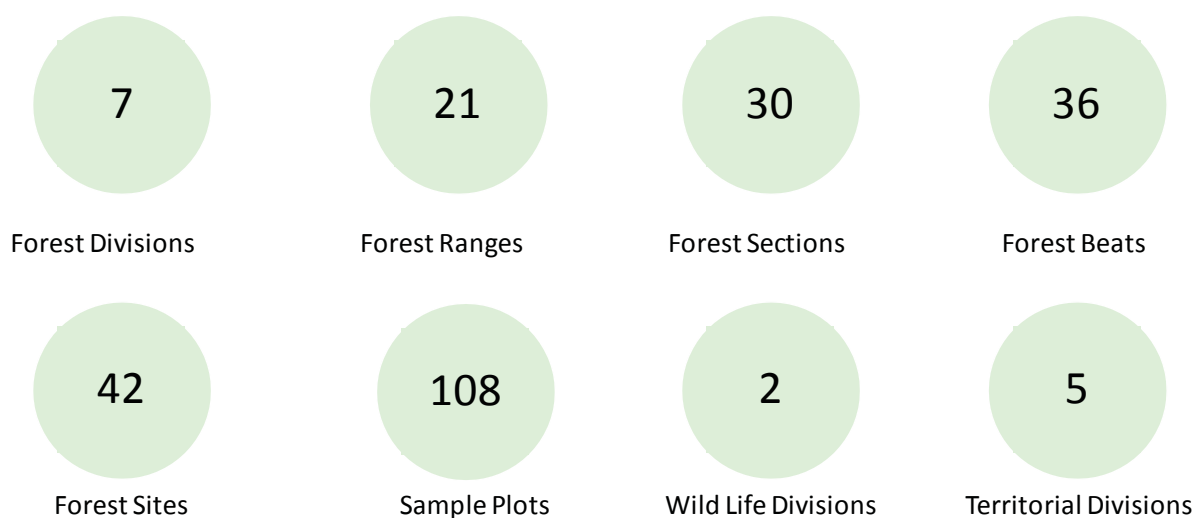
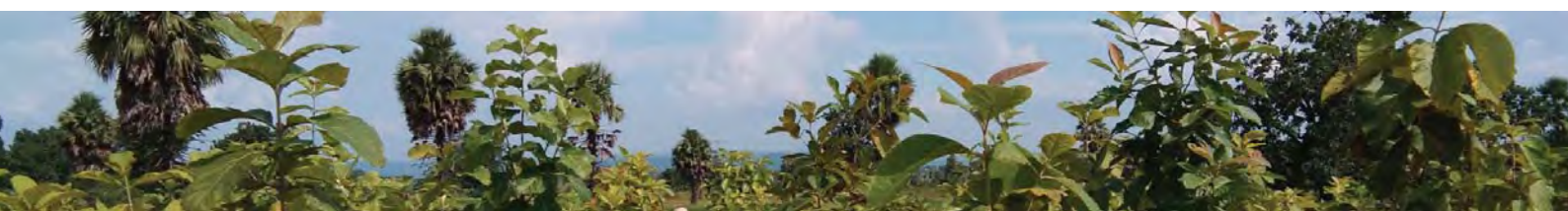


Figure 3:3: Assessment Coverage



### 3.5 Site Coverage:

The study covered 42 sites in seven forest divisions, covering both plantation, silvicultural operations and different infrastructural facilities / assets created under CAMPA. Of the total site coverage, 84.3 percent are plantation sites and 15.7 percent are sites with silvicultural operations. The infrastructural facilities and services (created assets) along with SMC works were assessed across all the sites in each forest division.

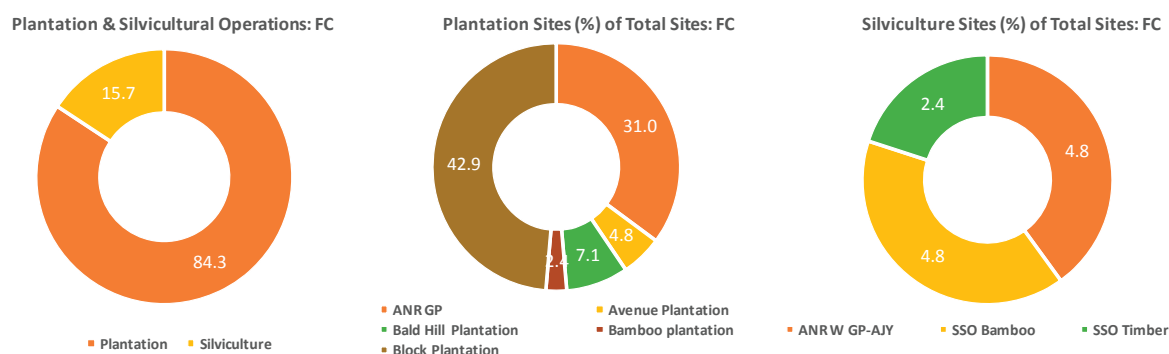
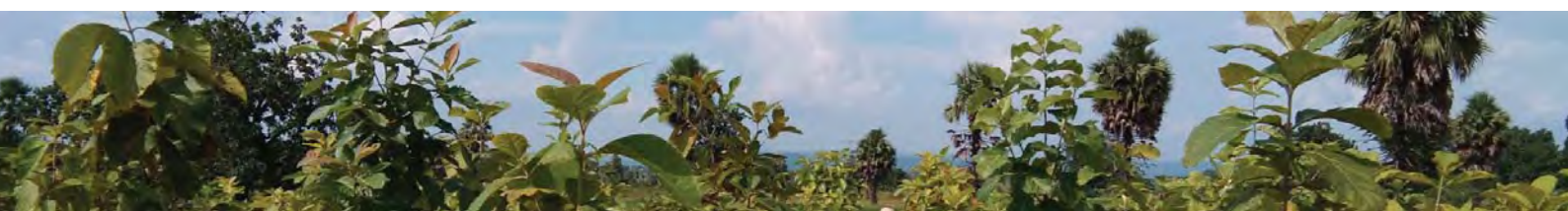
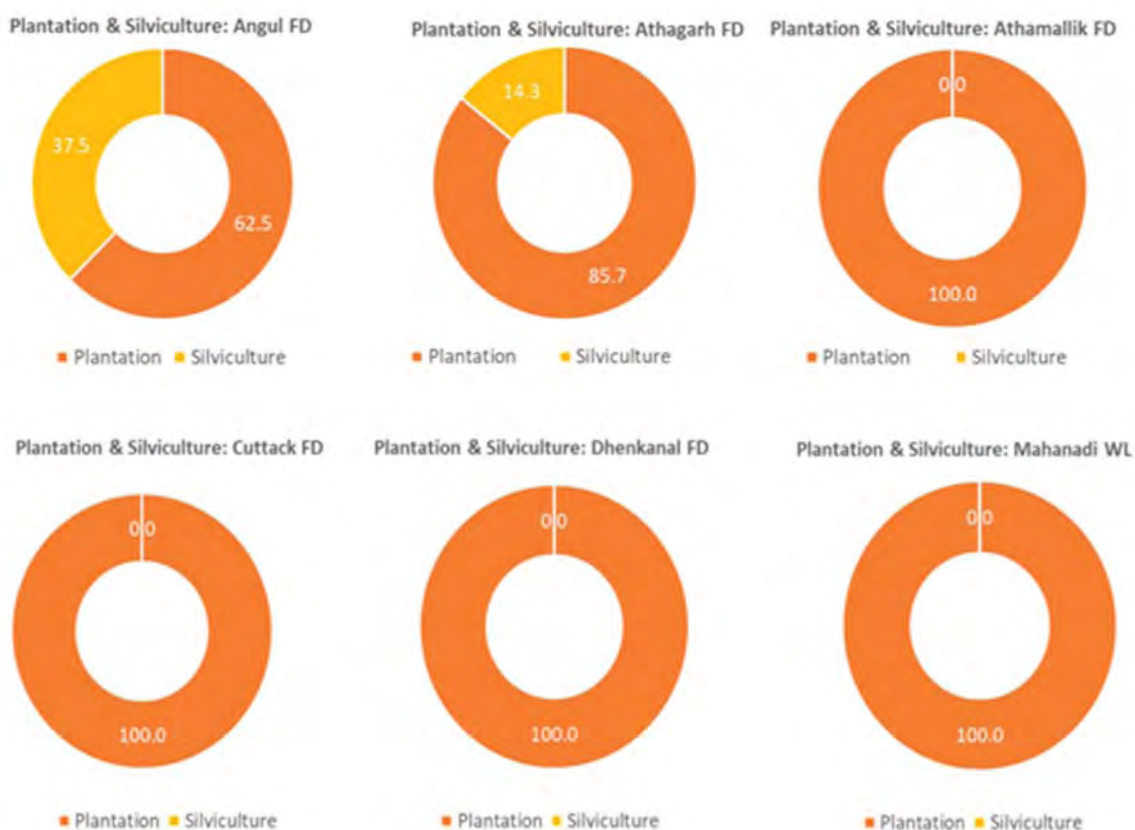


Figure 3:4: Site Distribution by Plantation / Silviculture

The plantation sites cover (1) ANR with gap plantation (ANR GP) (31.0 percent), (2) avenue plantation (4.8 percent), (3) bald hill plantation (7.1 percent), (4) Bamboo plantation (2.4 percent) and (5) block plantation (42.9 percent). In silvicultural operations, the study covered (1) ANR without gap plantation (ANR W GP) (4.8 percent), (2) SSO Bamboo (4.8 percent) and (2) SSO-timber (2.4 percent). Circle and Division level distribution of sites are presented in the figures.





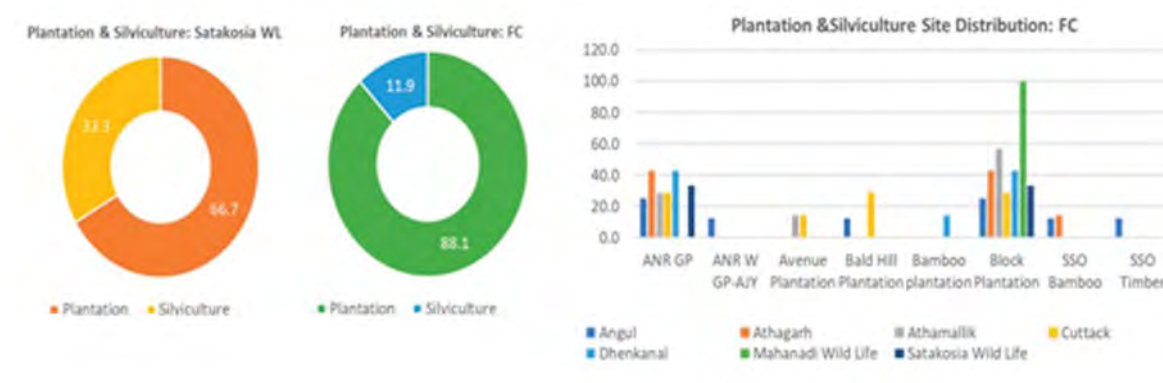


Figure 3.5: Plantation & Silvicultural Operation Distribution by Forest Division

### 3.6 Area of the Site:

Plantation in the circle covers a total area of 35803 ha. since 2009-10, i.e., on an average 4475.4 ha. per year, irrespective of type of plantation. Plantation by categories reflects that the circle has highest area of plantation under ANR with Gap Plantation category, followed by Block Plantation. Similarly, under silvicultural operation, the area coverage remains to be 85930 ha., irrespective of operational typology. Plantation activities and silvicultural operations have been taken up since 2009-10. Though silvicultural operations in different sites were in force, specific investments made for silvicultural operations under CAMPA from 2010-11 to 2015-16. Year wise distribution of sites by plantation and silvicultural operation is presented in the figure.



Figure 3.6: Distribution of Studied Sites by Year of Plantation



The average plantation area of the studied sites observed to be 112.4 ha. with total plantation area of 10,228.2 ha. Of the total plantation area, 46.0 percent are ANR with gap plantation, followed by bamboo plantation (37.2 percent). Avenue plantation and bald hill plantation has been less, i.e., 0.2 percent and 0.6 percent respectively. Block plantation is 16.0 percent of the total area.

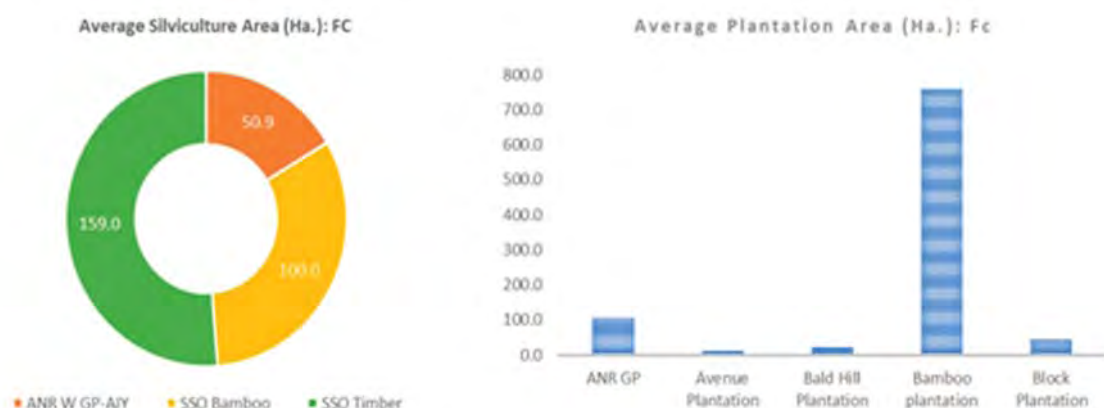
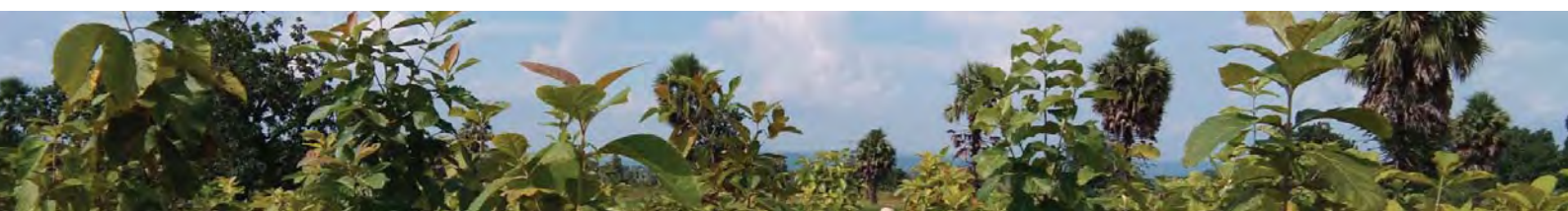
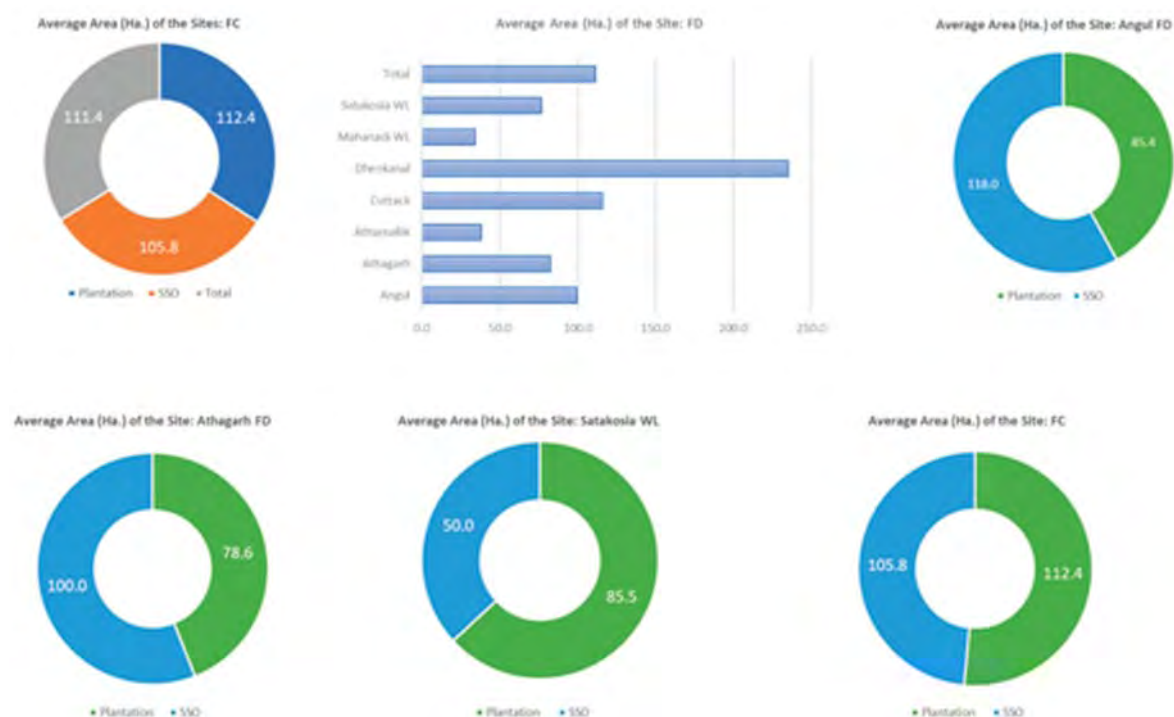


Figure 3:7: Mean Area (ha.) under Plantation and Silviculture by Type

Average area under silvicultural operation, irrespective of its type, is 105.8 ha. with total area of 1,798.5 ha. In the silvicultural operation, emphasis has been given to SSO Bamboo (45.5 percent of the total silviculture area) followed by SSO timber (44.2 percent of the total silviculture area). Average area under plantation and silvicultural operations by forest division is presented in the figure.





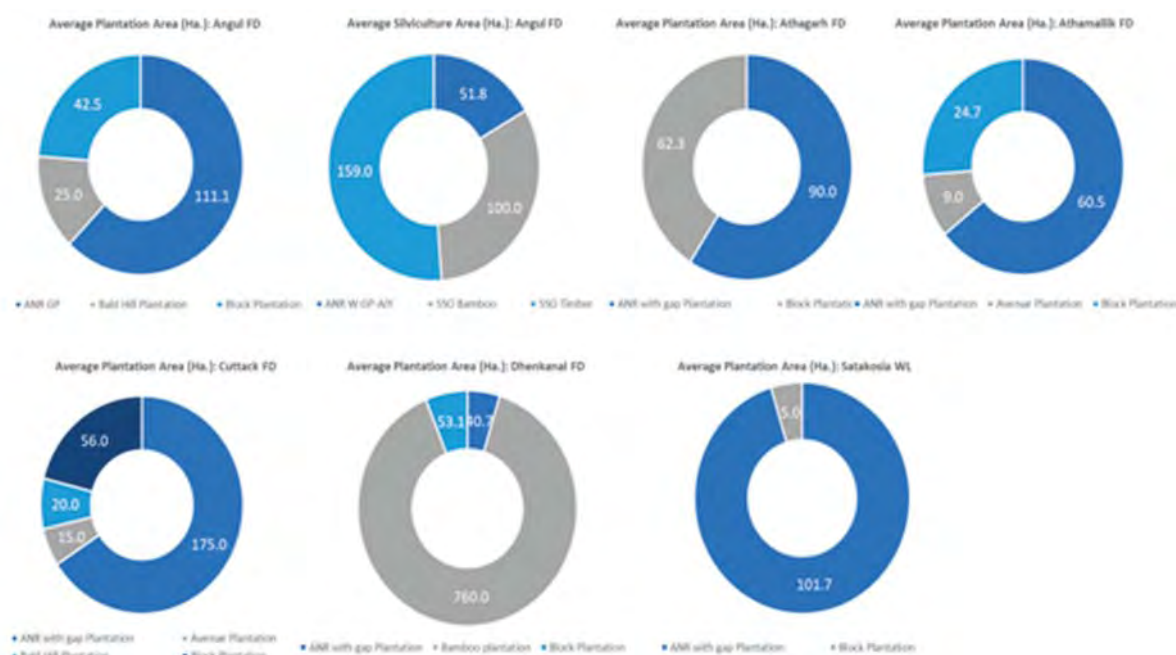
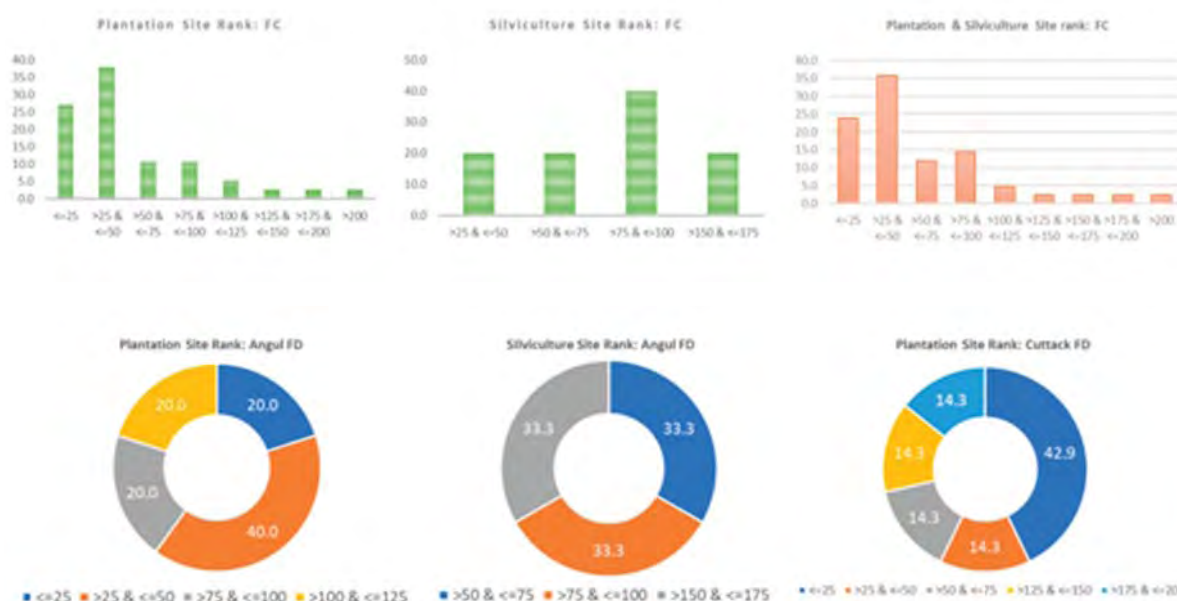


Figure 3:8: Ranking of Plantation and Silvicultural Operations by Site

Ranking of the plantation sites, based on its area (ha.) reveals that 27.0 percent plantation area, irrespective of plantation category, are  $\leq 25$  ha. Of the total, 37.8 percent plantation area are in the category of  $>25$  and  $\leq 50$  ha. In the higher area categories, number of sites are less, i.e., 2.7 percent sites in  $>175$  and  $\leq 200$  category, 2.7 percent sites are in  $>200$  category. In total, 86.5 percent sites are within  $>75$  and  $\leq 100$  category. So, plantation activities have been taken up in the circle covering areas of different size where higher focus is to cover small patches of land that are below 100 ha. Similarly, silvicultural operations also have focus on small patches as well as bigger size of the area. In silvicultural operation, sites normally fall under  $\leq 100$  ha. (80.0 percent). There is no silvicultural operation in areas that are  $\leq 25$  ha. and  $>175$  ha. Ranking of plantation sites by area (ha.) for the forest circle and divisions are presented in diagrams.



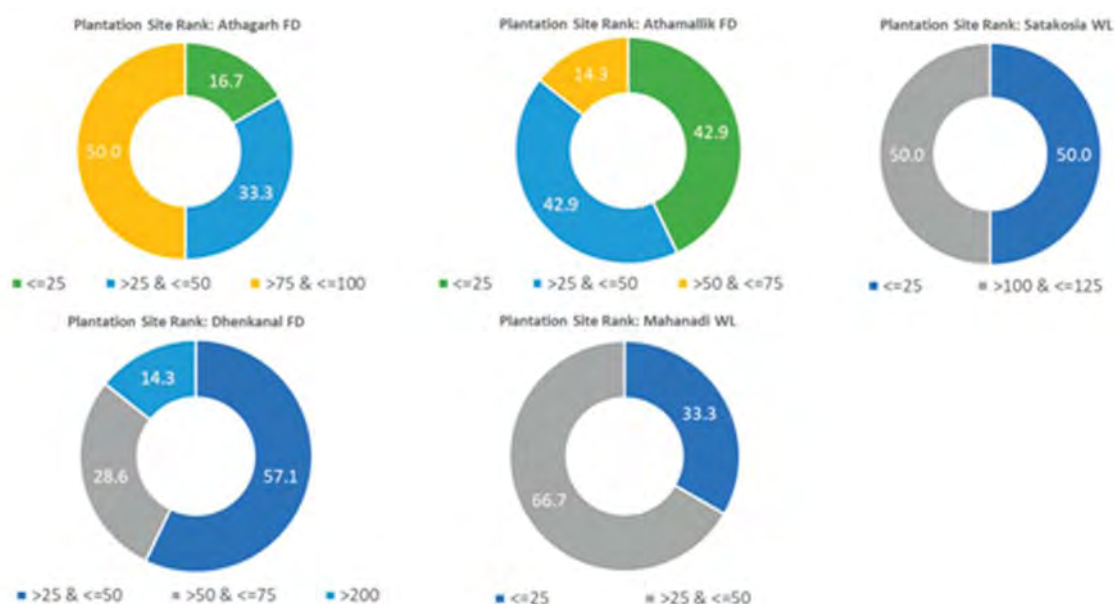


Figure 3:9: Ranking of Plantation & Silvicultural Operation Sites by Forest Division

### 3.7 Plant Survival Rate:

Plant survival rate varies by plantation categories and also by forest divisions. Overall, plant survival rate is calculated to be 88.2 percent. Highest plant survival rate observed in Athamallik (91.2 percent), followed by Athagarh (88.8 percent) and Angul (88.6 percent). Comparatively less plant survival rate is observed in Mahanadi WL forest division (77.8 percent) followed by Satakosia WL (86.0 percent). Plant survival rate by plantation categories are discussed below.

#### 3.7.1 Block Plantation:

Average number of plants per ha., varies considerably across sites, plots, by type of plantation and also by forest divisions. In block plantation, average no. of plants per ha. enumerated to be 1,384 with highest average number of plants in Athamallik (1447) and lowest in Mahanadi WL (1244). The plant survival rate varies from 90.4 percent (Athamallik FD) to 77.8 percent (Mahanadi WL).

#### 3.7.2 Bald Hill Plantation:

Bald hill plantation observed in two forest divisions, i.e., Angul and Cuttack. In bald hill plantation, average no. of plants per ha. enumerated to be 1,450 with highest average number of plants in Angul FD (1,520). The survival rate of the plants under these categories found to be lowest in Cuttack FD (88.4 percent) and highest in Angul FD (95.0 percent).

#### 3.7.3 ANR with Gap Plantation:

ANR with gap plantation (enrichment planting) is taken in a dual mode, i.e., dense plantation in block mode in identified patch of land and/or sparse / scattered plantation in the forest area. Plot specific plant count varies across plots and by forest division. As plantation mode has been of different nature, total plants planted and plants standing on the ground were taken into account to estimate survival and mortality rate per ha. Average number of plants per ha. enumerated to be 180 with highest number of plants per ha. in





Dhenkanal (185) and Athamallik (185) forest divisions and lowest in Satakosia WL (171). Plant survival rate per ha. varies between 92.5 percent (Dhenkanal and Athamallik) to 85.6 percent (Satakosia WL).

### 3.7.4 Avenue Plantation:

Avenue plantation is taken up in two forest divisions of the circle, i.e., in Athamallik and Cuttack. Average number of plants per r.km. enumerated to be 226. Plant survival rate observed to be 90.7 percent in Athamallik and 90.4 percent in Cuttack.

### 3.7.5 Bamboo Plantation:

Bamboo plantation has been taken up in Dhenkanal forest division. The plant survival rate calculated to be 92.1 percent.

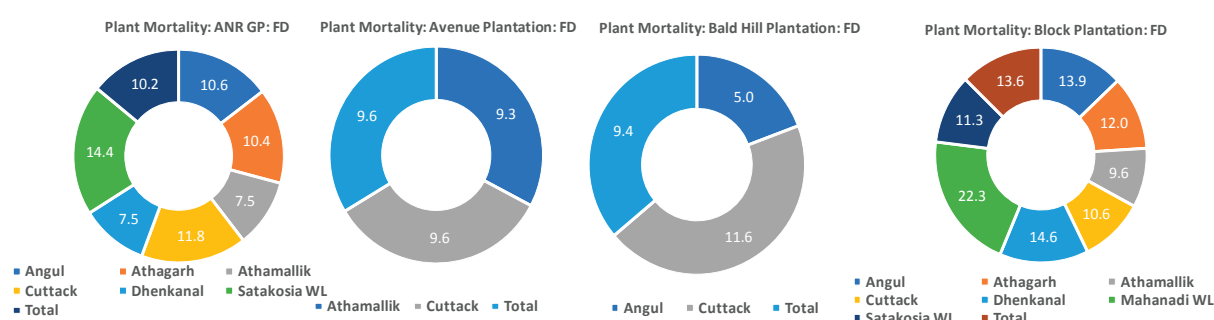


Figure 3:10: Plant Mortality Rate under Different Plantation Categories

Plant survival rate under specific plantation categories varies across the forest divisions in the circle. Forest division wise plant survival rate under different plantation categories are presented in the figures below.

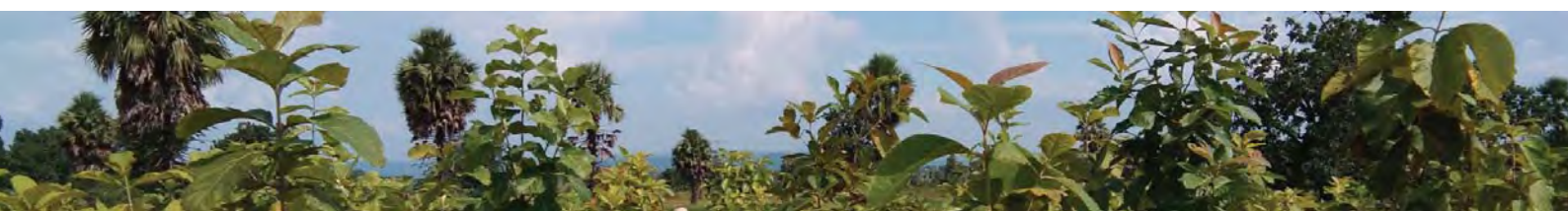
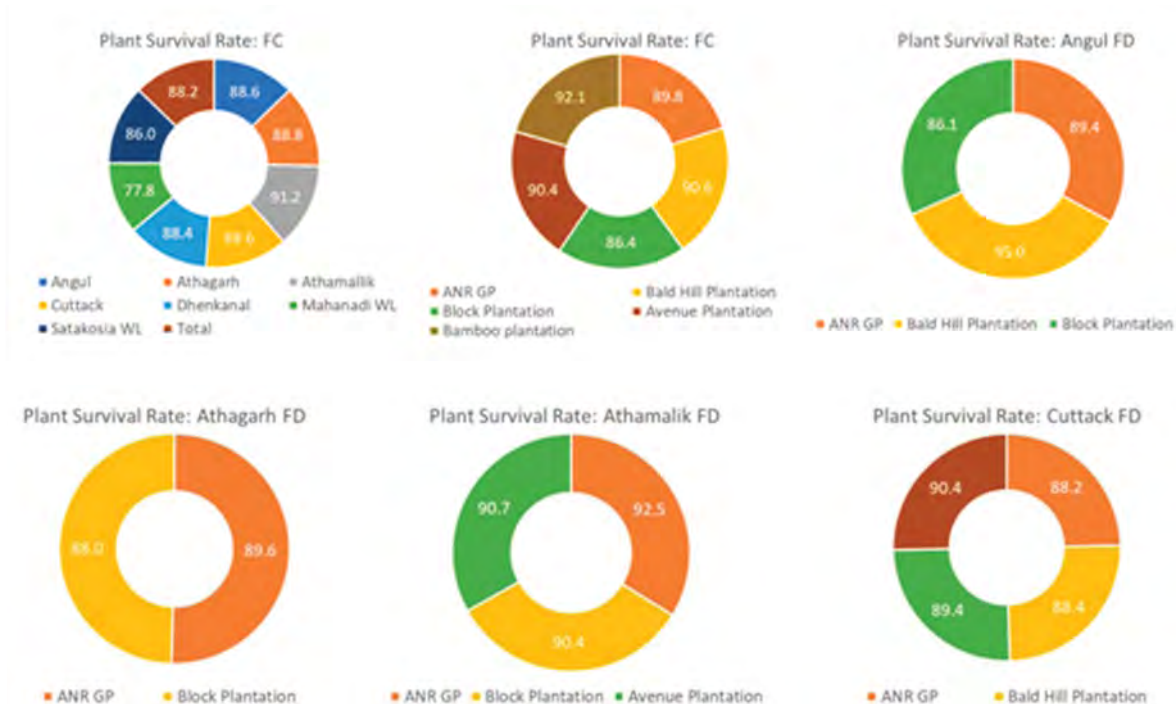




Figure 3:11: Plant Mortality Rate by Forest Divisions





Ranking of sites by plant survival reveals that at the circle level, about 4.7 percent are in >95 % survival category, 14.0 % are in the >93% & ≤95% category followed by 25.6 % in >90 % to ≤93 % survival category. with regard to aggregating different survival rate categories, it can be concluded that 60.5 percent sites have plant survival rate within 90.0 percent and 90.7 percent sites have plant survival rate within 85.0 percent. Circle and division wise ranking of plantation sites based on plant survival rate is presented in the table.

*Table 3.2: Plant Survival Rate Ranking by Plantation Categories*

Plantation Types	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	>95 %	>93 % & ≤95 %	>90 % & ≤93 %	>88 % & ≤90 %	>85 % & ≤88 %	>80 % & ≤85 %	>75 % & ≤80 %	>70 % & ≤75 %	≤70 %
ANR with GP	2.2	15.6	28.9	17.8	20.0	11.1	4.4	0.0	0.0
Avenue Plantation	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Bald Hill Plantation	0.0	66.7	0.0	0.0	0.0	33.3	0.0	0.0	0.0
Block Plantation	8.3	8.3	19.4	16.7	19.4	11.1	5.6	2.8	8.3
<b>Total</b>	<b>4.7</b>	<b>14.0</b>	<b>25.6</b>	<b>16.3</b>	<b>18.6</b>	<b>11.6</b>	<b>4.7</b>	<b>1.2</b>	<b>3.5</b>

*Table 3.3: Plant Survival Rate Ranking by Plantation Categories & Forest Divisions*

Divisions	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	>95 %	>93 ≤ 95 %	>90 ≤ 93 %	>88 ≤ 90 %	>85 ≤ 88 %	>80 ≤ 85 %	>75 ≤ 80 %	>70 ≤ 75 %	≤70 %
Angul									
ANR with gap Plantation	0.0	11.1	33.3	33.3	11.1	0.0	11.1	0.0	0.0
Bald Hill Plantation	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Block Plantation	0.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0
<b>Total</b>	<b>0.0</b>	<b>14.3</b>	<b>21.4</b>	<b>21.4</b>	<b>21.4</b>	<b>14.3</b>	<b>7.1</b>	<b>0.0</b>	<b>0.0</b>
Athagarh									
ANR with gap Plantation	0.0	20.0	40.0	0.0	20.0	20.0	0.0	0.0	0.0
Block Plantation	0.0	0.0	14.3	42.9	14.3	28.6	0.0	0.0	0.0
<b>Total</b>	<b>0.0</b>	<b>11.8</b>	<b>29.4</b>	<b>17.6</b>	<b>17.6</b>	<b>23.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Athamallik									
ANR with gap Plantation	0.0	40.0	40.0	0.0	20.0	0.0	0.0	0.0	0.0
Avenue Plantation	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Block Plantation	33.3	50.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7
<b>Total</b>	<b>16.7</b>	<b>41.7</b>	<b>25.0</b>	<b>0.0</b>	<b>8.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>8.3</b>
Cuttack									
ANR with gap Plantation	0.0	10.0	10.0	30.0	30.0	20.0	0.0	0.0	0.0
Avenue Plantation	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Bald Hill Plantation	0.0	50.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0
Block Plantation	0.0	0.0	60.0	0.0	40.0	0.0	0.0	0.0	0.0



Divisions	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	>95 %	>93<= 95 %	>90<= 93 %	>88<= 90 %	>85<= 88 %	>80<= 85 %	>75<= 80 %	>70<= 75 %	<=70 %
Total	0.0	11.1	27.8	16.7	27.8	16.7	0.0	0.0	0.0
Dhenkanal									
ANR with gap Plantation	16.7	16.7	33.3	33.3	0.0	0.0	0.0	0.0	0.0
Block Plantation	12.5	0.0	25.0	12.5	12.5	0.0	25.0	12.5	0.0
Total	14.3	7.1	28.6	21.4	7.1	0.0	14.3	7.1	0.0
Mahanadi WL									
Block Plantation	0.0	0.0	20.0	20.0	20.0	0.0	0.0	0.0	40.0
Total	0.0	0.0	20.0	20.0	20.0	0.0	0.0	0.0	40.0
Satakosia WL									
ANR with gap Plantation	0.0	0.0	20.0	0.0	40.0	20.0	20.0	0.0	0.0
Block Plantation	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Total	0.0	0.0	16.7	16.7	33.3	16.7	16.7	0.0	0.0

### 3.8 Canopy Cover:

Canopy cover normally depends upon the age of the plant, species and soil type. It is observed in the assessment that the canopy cover varies by plantation types and year of plantation. As year of plantation varies along with plant species, canopy cover varies by site and by forest divisions.

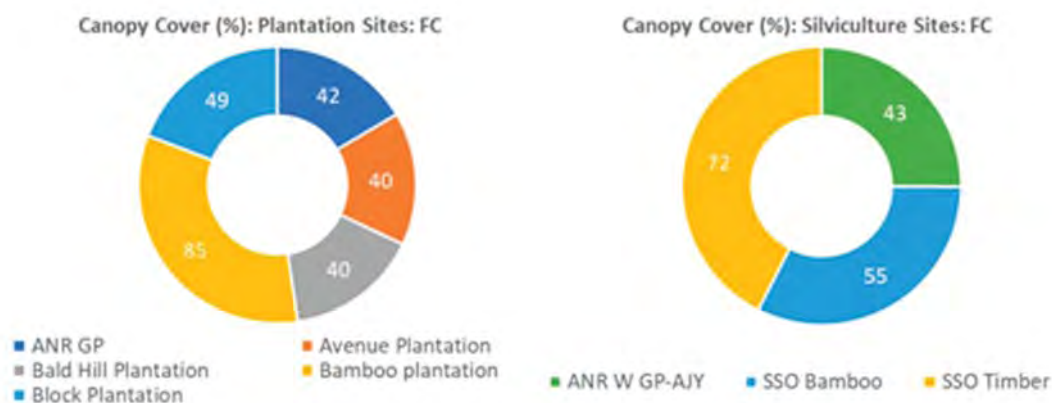


Figure 3:12: Canopy Cover (%) in Forest Circle

Canopy cover in bamboo plantation is observed high among all the plantation categories (85.0 percent), followed by block plantation (49.0 percent) and ANR with gap plantation (42.0 percent). Among all the plantations, sites covered under silvicultural operations in many sites have better canopy cover in comparison to plantation sites. Average canopy cover observed to be highest in case of SSO timber (72.0 percent) followed by SSO Bamboo (55.0 percent). Canopy cover of plantation sites (by plantation category) and sites covered under silvicultural operational is presented below by forest division in figures and tables.







Figure 3:13: Canopy Cover in Plantation and Silviculture by FD



Irrespective of the years, highest of 10.0 percent sites have canopy cover <10 percent, 17 percent sites in the rank of >10 & ≤20 percent, 18.0 percent sites in the range of >30 & ≤40 percent category. In case of plantations, 29.0 percent sites have canopy cover >50 percent in case of ANR with gap plantation and 53.0 percent in case of block plantation. In case of bald hill plantation, all the sites having canopy cover in the range of >30 & ≤40 percent range. In silvicultural operation, canopy cover is >60 percent in all the cases in case of SSO timber whereas in case of SSO Bamboo, canopy cover varies and 51.0 percent sites have canopy cover >40 percent. Ranking of canopy cover by plantation and silviculture operational sites are presented in table.

Table 3.4: Canopy Cover Ranking by Plantation & Silviculture

Categories	Canopy Cover (%) Ranking (% Distribution of)								
	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	<=10	>10 & ≤20	>20 & ≤30	>30 & ≤40	>40 & ≤50	>50 & ≤60	>60 & ≤70	>70 & ≤80	>80
Plantation									
ANR GP	13	11	9	22	16	9	13	7	
Bald Hill Plantation				100					
Bamboo plantation									100
Block Plantation	11	25		6	6	28	8	6	11
Silviculture									
ANR W GP-AJY				75	25				
SSO Bamboo		50			13	38			
SSO Timber							40	60	
<b>Total</b>	<b>10</b>	<b>17</b>	<b>4</b>	<b>18</b>	<b>10</b>	<b>16</b>	<b>10</b>	<b>7</b>	<b>8</b>

Table 3.5: Canopy Cover (%) by Forest Division

Categories	Canopy Cover (%) Ranking (% Distribution of)								
	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	<=10	>10 & ≤20	>20 & ≤30	>30 & ≤40	>40 & ≤50	>50 & ≤60	>60 & ≤70	>70 & ≤80	>80
Angul									
ANR GP	67	33							
ANR W GP-AJY				100					
Bald Hill Plantation				100					
Block Plantation		50		50					
SSO Bamboo					25	75			
SSO Timber							40	60	
Total	24	20		20	4	12	8	12	
Athagarh									
ANR GP			20			40	40		





Categories	Canopy Cover (%) Ranking (% Distribution of)								
	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9
	<=10	>10 & <=20	>20 & <=30	>30 & <=40	>40 & <=50	>50 & <=60	>60 & <=70	>70 & <=80	>80
Block Plantation						57	14	29	
SSO Bamboo		100							
Total		19	10			38	24	10	
Athamallik									
ANR GP			40	60					
Block Plantation	67	33							
Total	42	17	17	25					
Cuttack									
ANR GP				50	50				
Bald Hill Plantation				100					
Block Plantation					40	60			
Total				44	39	17			
Dhenkanal									
ANR GP		33		33	33				
Bamboo plantation									100
Block Plantation		38				25			38
Total		26		11	11	11			42
Mahanadi WL									
Block Plantation		40				20	20		20
Total		40				20	20		20
Satakosia WL									
ANR GP							40	60	
ANR W GP-AJY				50	50				
Block Plantation							100		
Total				13	13		38	38	

### 3.9 Display of Plantation Sites:

Pillars have been installed in different plantation sites and sites covered under silvicultural operations across the forest divisions in the circle. No. of pillars have been erected based on the plantation / silviculture area and shape of the plot. Area under plantation having higher number of pillars than the silvicultural sites. About 85.3 percent plantation sites and 20.0 percent sites covered under silvicultural operations found having pillars. On an average, 31 pillars have been installed in each site, irrespective of the area of the site and plantation / silvicultural operations. Apart from pillars, about 60.0 percent plantation sites and 65.0



percent silviculture sites have sign boards. Mean and total pillars installed by plantation and silvicultural sites in different forest divisions are presented in the figure 3.14.

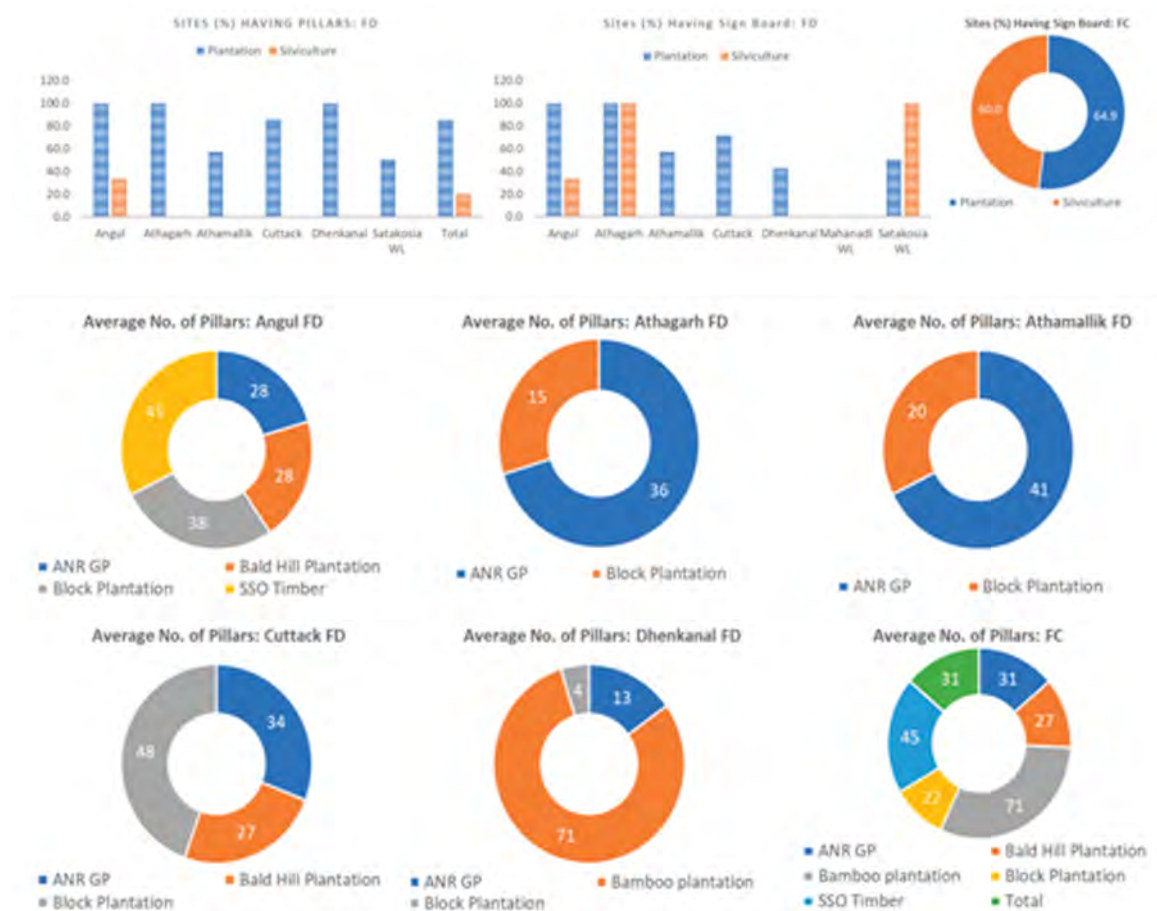


Figure 3.14: Installation of Pillars by Forest Divisions

### 3.10 Soil and Moisture Conservation (SMC) Measures:

Different soil moisture conservation measures have been taken under CAMPA in both plantation sites and area under silvicultural operations. These SMC works have been taken up based on its locational suitability and assessed requirements. The SMC activities taken up in plantation sites by and large covers staggered trench, half-moon trench, LBCD, check dam structure etc.

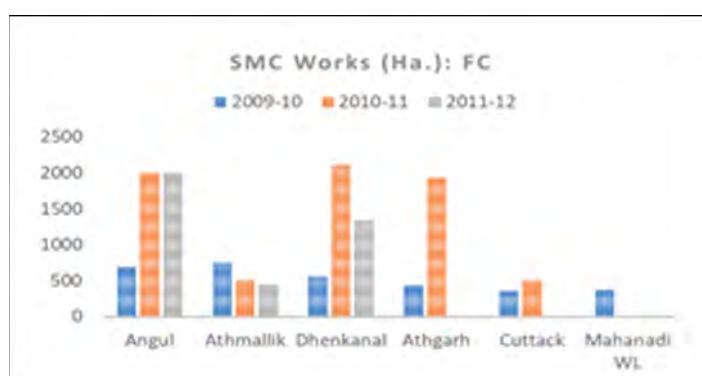


Figure 3.15 SMC Works in Forest Divisions (Source: Forest & Environment Dept.)

Different SMC works observed implemented in plantation sites with emphasis on staggered trench and LBCD structures. Percolation pits have also been taken up in some sites. In silvicultural operations, SMC measures taken are like LBCD structures, staggered trench, half-moon trench and stone packing.





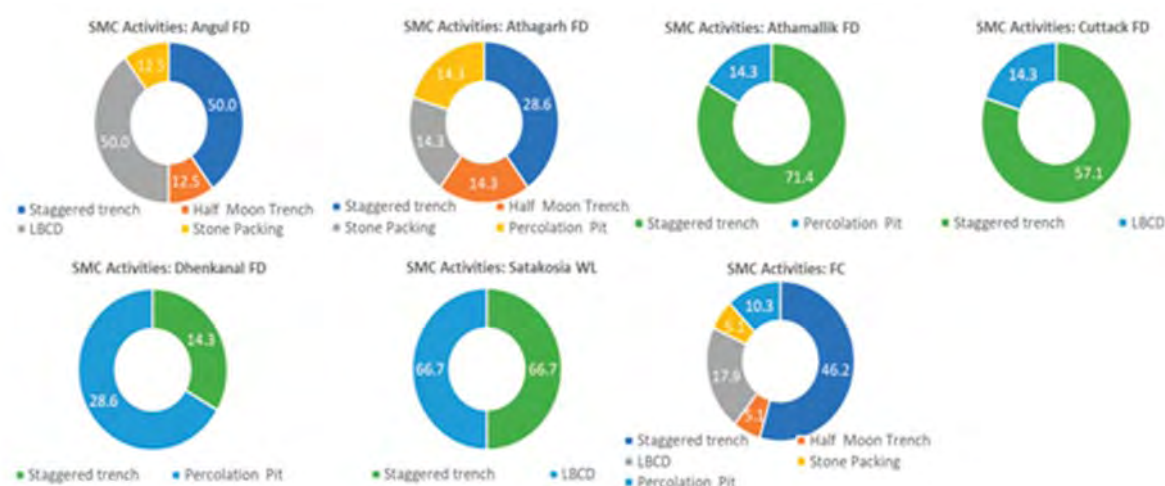


Figure 3:16: SMC Works by Forest Division

In Angul, 50.0 percent sites having staggered trench and same percentage of sites also have LBCD structures. Stone packing and half-moon trench observed in 12.5 percent cases of each category. In Athagarh, 28.6 percent sites having staggered trench, 14.3 percent sites having half-moon trench and same percentage of sites also have stone packing and percolation pit. Emphasis is given to staggered trench in Athamallik (71.4 percent sites) followed by percolation pits (14.3 percent sites). Similarly, in Cuttack, staggered trenches have been taken up in 57.1 percent sites along with LBCD structures in 14.3 percent sites.

Based on the need and locational requirements, many sites observed having more than one SMC works in plantation and silvicultural areas in the forest circle across different forest divisions. More than one SMC works have been taken up in 17.6 percent plantation sites and in 80.0 percent sites covered under silvicultural operations. Single SMC work has been taken up in 38.2 percent plantation sites and 20.0 percent sites having silvicultural operations. Overall, all the silvicultural sites (100.0 percent) having SMC interventions whereas 55.9 percent plantation sites having SMC works. Considering plantation and silviculture together, 50.0 percent sites in Angul, 28.6 percent sites in Athagarh, 14.3 percent sites in Athamallik, 14.3 percent sites in Cuttack and 66.7 percent sites in Satakosa WL have more than one SMC works. Overall, more than one SMC work observed in 25.6 percent sites, combining plantation and silviculture. At the forest circle and division wise single and more than one SMC works taken up under CAMPA is presented in the figure 3.17.



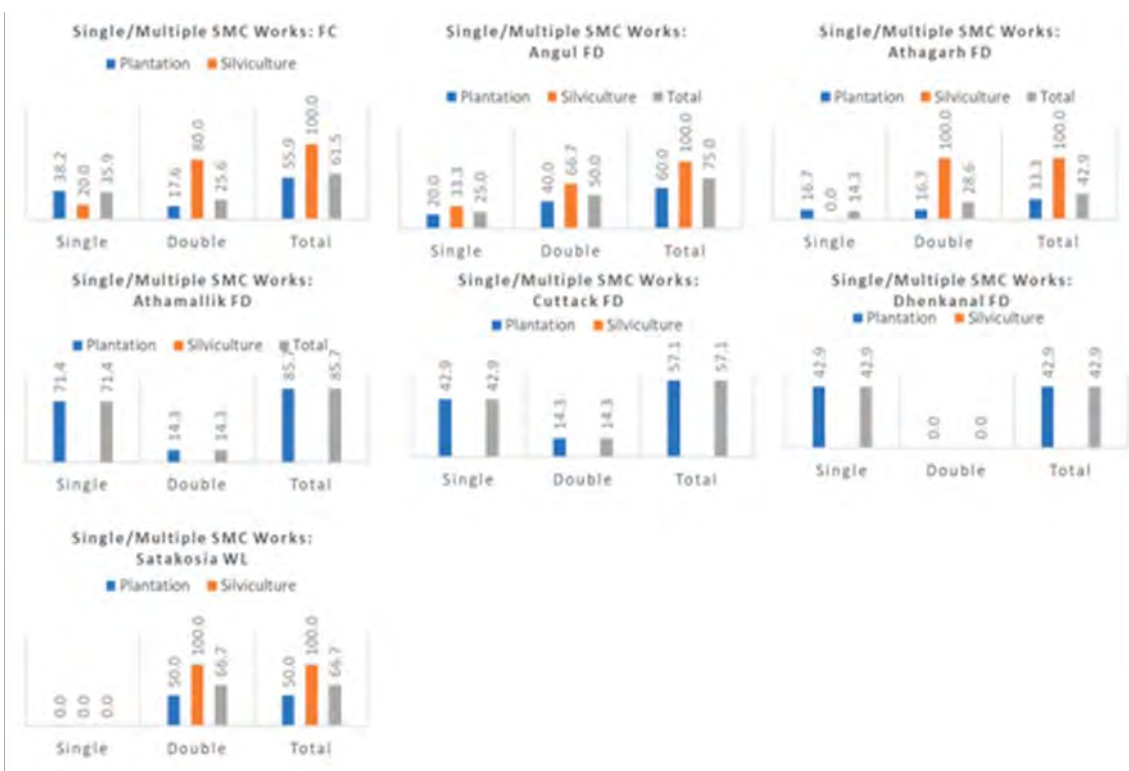


Figure 3:17: Single / Multiple SMC Activities in Forest Divisions

Table 3.6: Single &amp; Multiple SMC Works in Plantation and Silviculture Site

Forest Division	Plantation / Silviculture	Single SMC (%)	More than One SMC (%)	Total (%)
Angul	SSO Timber	100.0		100.0
	ANR without Gap - AJY		100.0	100.0
	ANR with gap Plantation		100.0	100.0
	Bald Hill Plantation	100.0		100.0
	SSO Bamboo		100.0	100.0
	ANR with gap Plantation		100.0	100.0
	Plantation	33.3	66.7	100.0
	Silviculture	33.3	66.7	100.0
	Total	33.3	66.7	100.0
Athagarh	SSO Bamboo		100.0	100.0
	ANR with gap Plantation		100.0	100.0
	ANR with gap Plantation	100.0		100.0
	Plantation	50.0	50.0	100.0
	Silviculture		100.0	100.0
	Total	33.3	66.7	100.0





Forest Division	Plantation / Silviculture	Single SMC (%)	More than One SMC (%)	Total (%)
<b>Athamallik</b>	Block Plantation	100.0		100.0
	Block Plantation	50.0	50.0	100.0
	ANR with gap Plantation	100.0		100.0
	ANR with gap Plantation	100.0		100.0
	Block Plantation	100.0		100.0
	Plantation	83.3	16.7	100.0
	Silviculture			
	Total	83.3	16.7	100.0
<b>Cuttack</b>	ANR with gap Plantation	100.0		100.0
	Bald Hill Plantation	100.0		100.0
	Bald Hill Plantation		100.0	100.0
	ANR with gap Plantation	100.0		100.0
	Plantation	75.0	25.0	100.0
	Silviculture			
	Total	75.0	25.0	100.0
<b>Dhenkanal</b>	ANR with gap Plantation	100.0		100.0
	Bamboo plantation	100.0		100.0
	ANR with gap Plantation	100.0		100.0
	Plantation	100.0		100.0
	Silviculture			
	Total	100.0		100.0
<b>Satakosia WL</b>	ANR with gap Plantation		100.0	100.0
	ANR without Gap - AJY		100.0	100.0
	Plantation		100.0	100.0
	Silviculture		100.0	100.0
	Total		100.0	100.0
	Plantation	68.4	31.6	100.0
	Silviculture	20.0	80.0	100.0
	Total	58.3	41.7	100.0



### Case Study: “Drainage Line Treatment using Earthen Graded Bund contributes to prevention of Soil erosion, protection of Forest Roads and Promotion of Forest Ecology and Bio Diversity”

Village of Purunapani is situated in Danda Pahad forest of Chamundia forest range. During heavy rain, water enters into the agricultural field as well as village area leads to heavy siltation. Besides, soil erosion is a common problem of this site and to combat this kind of situation, the Forest Department



of Odisha planned to construct an “Earthen Graded Bund” under CAMPA APO 2015-16. The plan came into action during the year 2016-17 after detailed survey of the site under proper guidance of the forest department. The Earthen Graded Bund is 1220-meter-long with one side stone patching. Some Loose Boulder Check Dams (LBCDs) were also constructed near to earthen bund for soil moisture conservation.

LBCD was viewed useful as it controlled discharge rate. The geographical location of starting point of earthen bund is N 200 28' 40.9" and E 840 45' 33.4".

As a result, green cover around earthen bund periphery increased. Regeneration of natural species like Sal, Asana, Mai, Sidha, Kendu, Dhaura, Bela, Harada and Chara were also observed there. Wild animals like Elephant, Barking Deer, and Wild boar, Monkey, Snake and Spotted Deer are frequently coming and staying there. Some important outcomes of Earthen graded bund include increase in green cover and increase in ground water level, drainage of excess rain water with soil conservation. Previously forest road was being damaged every year due to stagnation of rain water. After construction of SMC, rain water got diverted and so also the flow along the drainage line which related in less damage the forest road.





### Case Study: “underground soil & water conservation through Surface dyke at Sitalpani under Mahanadi WL division”

Surface dyke is just like an under-ground dam. This is a subsurface barrier across stream which retards the base flow and stores water upstream below ground surface. By doing so, the water level in upstream part of ground water dam rises saturating other dry parts of aquifer. A subsurface dyke is a structure, built in an aquifer with the intention of obstructing the natural flow of ground water, thereby raising the ground water level and increasing the amount of water stored in the aquifer.

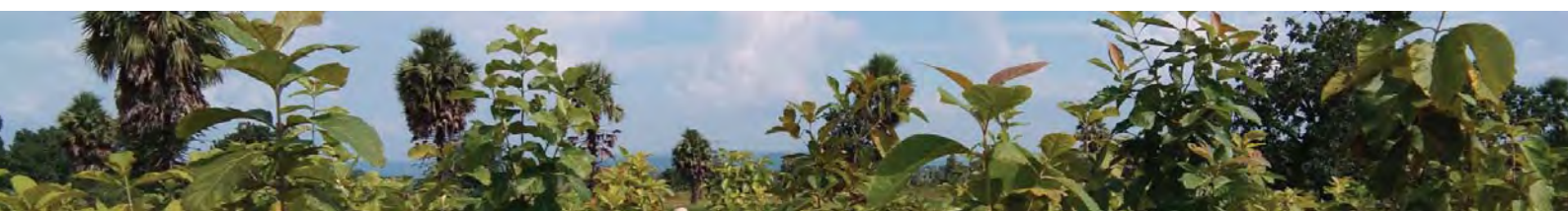
Sunakhala Nala (Stream) is situated in Mahanadi RF near Sunakhala forest guard quarter and falls into Mahanadi River. However, in the month of May, it gets dried every year. So that the forest site became dry after the month of May. In this regard forest department decided to build a ‘surface dyke’ for conserving ground water. In the APO year 2016-17 department planned to build a surface dyke on the Sunakhala Nala. In the next year i.e. 2017-18 department constructed a surface dyke at the geographical point of N 200 36’ 27.8” and E 840 44’ 56.7”. The ideal location for the dyke was well defined, wide, and sloppy with a narrow outlet having limited thickness of loose soil.

This surface dyke was constructed 40 feet long. The project was completed with a total cost of Rs. 746731. The depth of construction is about 7feet and the thickness of the wall is 0.10 feet. The dimension of surface dyke is mentioned below.

1. Base = 40 ft. X 6 ft. X 1 ft. = 240 cft
2. Footing = 40 ft. X 2 ft. X 1 ft. = 100 cft.
3. Plinth = 40 ft. X 10 ft. X 5 ft. = 166 cft.

**Total = 506 cft**

After construction of this surface dyke there was effective conservation of ground water in the upstream side of the dyke. As a result, the moisture content of upstream soil reportedly, there was increased green coverage of this area. It helped to control the soil erosion and break the speed of the rain water.



### 3.11 Plant Height and GBH/GCH:

Height of the plants and girth of the plants of different species were measured to understand the growth factor. Growth of the plant by height and girth also represents the cultural practices and measures taken for ensuring appropriate nurturing of the plantation sites. The mean maximum height of the plants, irrespective of the year of plantation, location, type of plantation and plant species, calculated to be 6.0 mt. The mean minimum height of the plants at the circle level found to be 3.2 mt. for the plantation sites. Similarly, mean maximum GBH/GCH has been 32.4 cm and mean minimum GBH/GCH has been 15.7 cm.

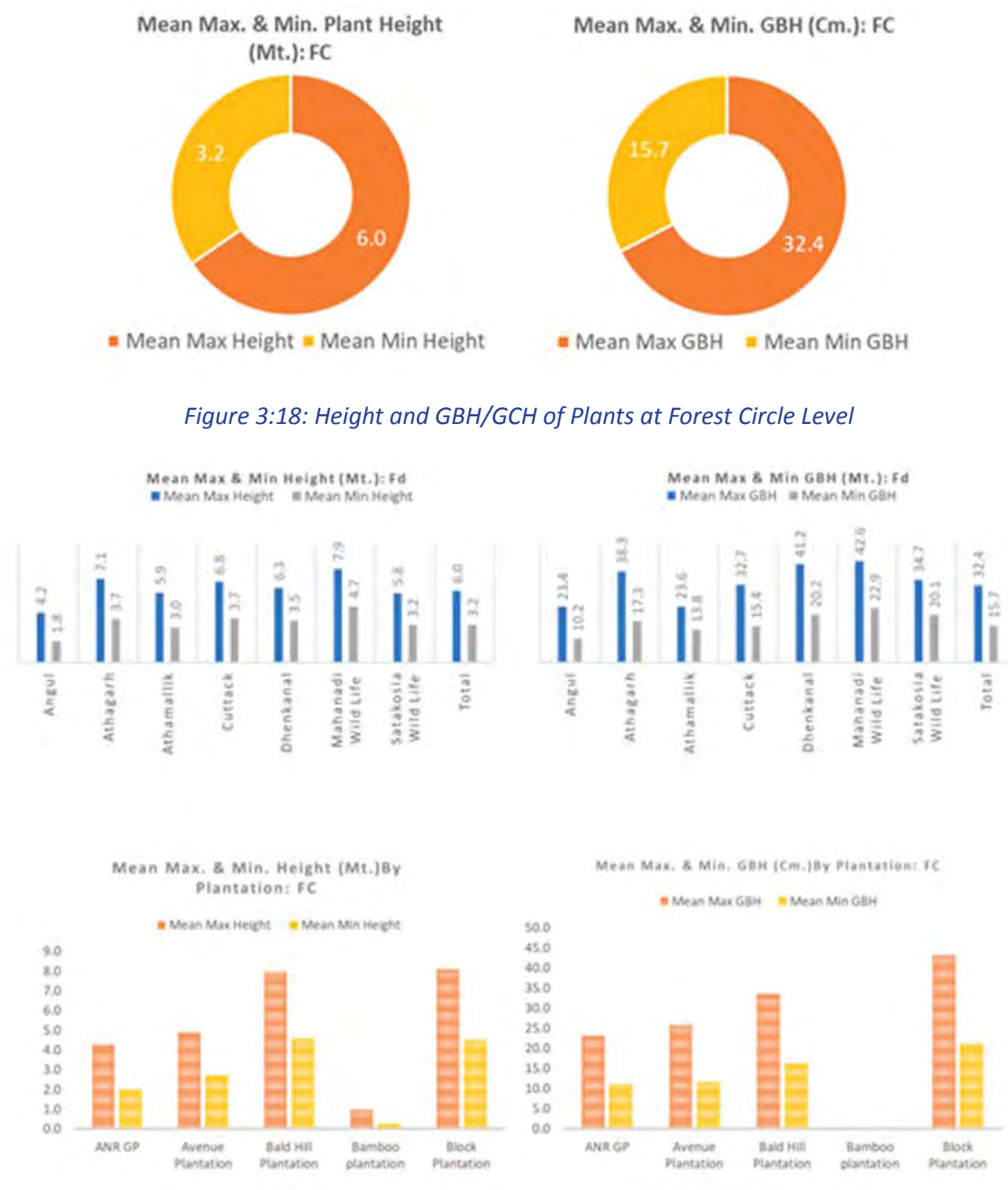


Figure 3:19: Height and GBH/GCH of Plants at Forest Division Level





Height and girth of the plants by forest divisions reflects that mean maximum height of the plants in plantation category is highest in Mahanadi WL (7.9 mt.) followed by Athagarh FD (7.1 mt.) and lowest in Angul (4.2 mt.). Similar trend is observed in case of mean minimum height, where Mahanadi WL is highest with 4.7 mt. and Angul is lowest with 1.8 mt. Similarly, in case of mean maximum and mean minimum GBH/GCH, Mahanadi WL is the highest among all the forest divisions. Details are presented and discussed below. The mean maximum and mean minimum height of the plants planted under different plantation works and its GBH/GCH is presented in the diagram.



Figure 3:20: Year & Forest Division Wise Plant Height and GBH/GCH

Irrespective of the site and plant species, the plants that were planted in the year 2009-10, is having mean maximum height of 7.6 mt. and mean minimum height of 4.2 mt. The mean maximum and mean minimum GBH/GCH of the plants measured to be 40.5 cm. and 20.1 cm. respectively. The mean maximum and minimum height of the plants, planted in the year 2009-10 found to be comparatively less than the plants planted in the year 2010-11 and 2013-14. As observed from field level plant measurements, there is increment in plant height and girth with years of plantation, i.e., plants have grown with each passed year. However, plantations taken up in 2010-11 in studied site reported higher height and GBH/GCH measurement in comparison to plantations taken up in the year 2009-10.

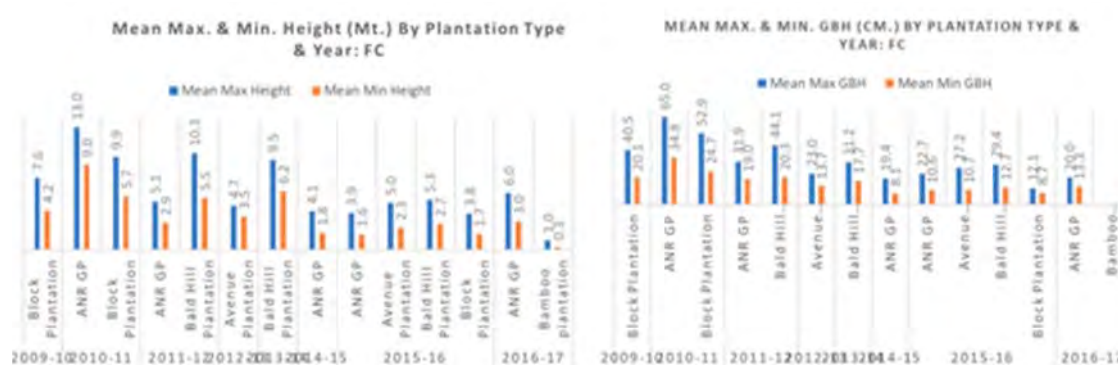
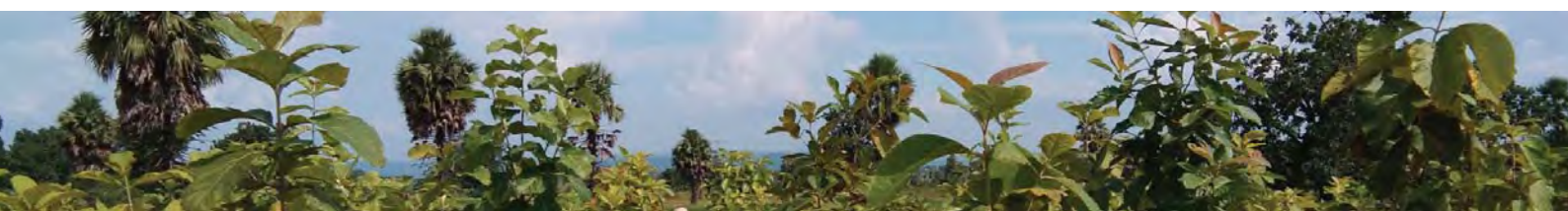


Figure 3:21: Mean Max. & Min. GBH/GCH by Plantation Year & Categories

Examining by plantation types, it is observed that the mean maximum and minimum height (mt.) of the plants in 2009-10 ANR with gap plantation is highest (13.0 mt.) followed by bald hill plantation done in the year 2011-12. However, in case of GBH/GCH, plants taken up under ANR with gap plantation in the year 2010-11 is highest, followed by block plantation in the year 2010-11 (52.9 cm.). The mean maximum and minimum height and GBH/GCH by year of plantation, plantation types and forest division are presented in the figures.



The plant growth per year, in terms of mean maximum and minimum height and GBH/GCH growth of the plants calculated based on the year of plantation. It is observed that per year growth of plants, irrespective of the species, varies by site and division. Mean maximum height growth of the plant per year observed in Cuttack and Athagarh (1.1 mt.) while mean maximum GBH/GCH growth of plants per year observed highest in Athagarh (5.7 cm.) and Cuttack (5.4 cm.).



Figure 3:22: Mean Max. & Min. Height & GBH/GCH Per Year

Average per year plant growth observed to be marginally higher in case of bald hill plantation and avenue plantation. Similarly, in case of GBH/GCH, per year growth of plants taken up under bald hill plantation is highest among all categories, followed by avenue plantation. Per year mean maximum and minimum growth of the plants (height and GBH/GCH) by forest division is presented in the figures.

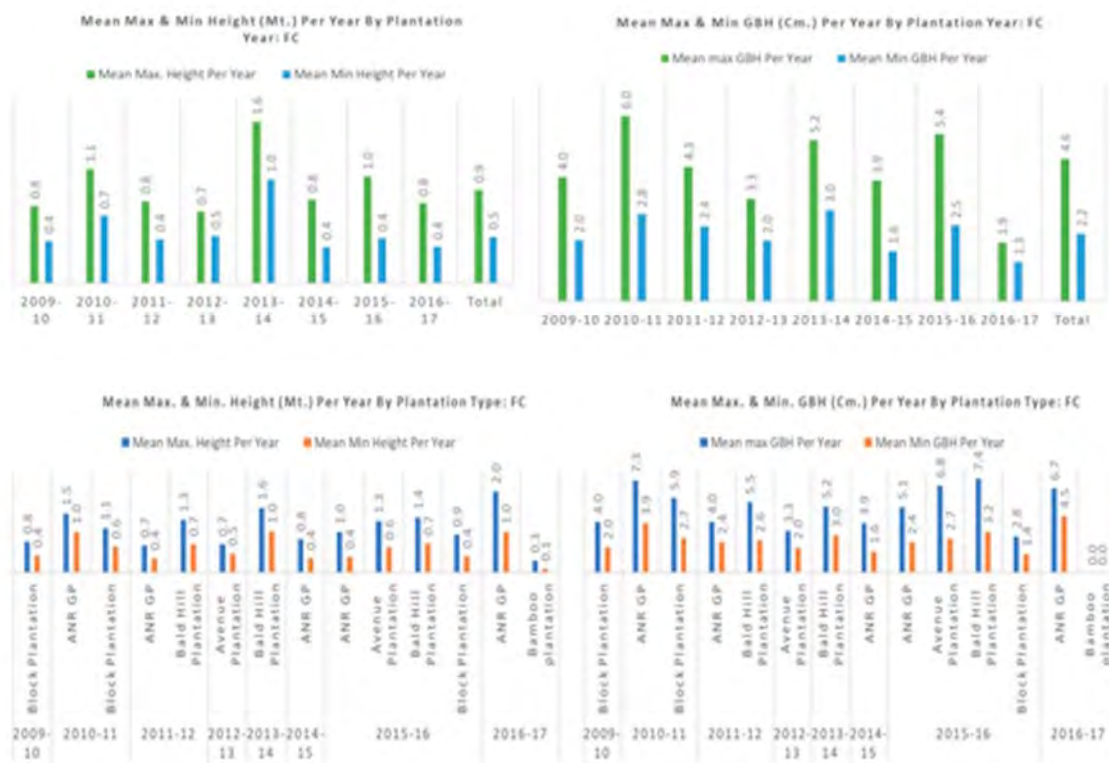






Figure 3:23: Mean Max. &amp; Min. Height &amp;GBH/GCH Per Year in Forest Divisions

Table 3.7: Ranking of Mean Maximum Plant Height by Plantation Types

Year	Plantation Types	Rank of Mean Maximum Height (in Mt.) of Plants in Sites (% Distribution)					
		1	2	3	4	5	6
		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14	>14 & <=17
2009-10	Block Plantation	0.0	33.3	26.9	26.9	12.8	0.0
2010-11	ANR GP	0.0	0.0	0.0	0.0	100.0	0.0
	Block Plantation	0.0	6.7	30.0	30.0	26.7	6.7
2011-12	ANR GP	6.7	33.3	60.0	0.0	0.0	0.0
	Bald Hill Plantation	0.0	25.0	0.0	25.0	50.0	0.0
2012-13	Avenue Plantation	0.0	66.7	33.3	0.0	0.0	0.0
2013-14	Bald Hill Plantation	0.0	0.0	16.7	83.3	0.0	0.0
2014-15	ANR GP	26.5	46.9	26.5	0.0	0.0	0.0
2015-16	ANR GP	21.7	58.3	20.0	0.0	0.0	0.0
	Avenue Plantation	0.0	66.7	33.3	0.0	0.0	0.0
	Bald Hill Plantation	14.3	42.9	42.9	0.0	0.0	0.0
	Block Plantation	33.3	66.7	0.0	0.0	0.0	0.0
2016-17	ANR GP	0.0	0.0	100.0	0.0	0.0	0.0
	Bamboo plantation	100.0	0.0	0.0	0.0	0.0	0.0

Table 3.8: Ranking of Mean Minimum Plant Height by Plantation Types

Year	Plantation Types	Rank of Mean Minimum Height (in Mt.) of Plants in Sites (% Distribution)				
		1	2	3	4	5
		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14
2009-10	Block Plantation	33.3	37.2	23.1	6.4	0.0
2010-11	ANR GP	0.0	0.0	0.0	100.0	0.0
	Block Plantation	0.0	53.3	40.0	3.3	3.3
2011-12	ANR GP	33.3	66.7	0.0	0.0	0.0
	Bald Hill Plantation	25.0	25.0	50.0	0.0	0.0
2012-13	Avenue Plantation	0.0	100.0	0.0	0.0	0.0



Year	Plantation Types	Rank of Mean Minimum Height (in Mt.) of Plants in Sites (% Distribution)				
		1	2	3	4	5
		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14
2013-14	Bald Hill Plantation	0.0	50.0	16.7	33.3	0.0
2014-15	ANR GP	75.5	24.5	0.0	0.0	0.0
2015-16	ANR GP	85.0	15.0	0.0	0.0	0.0
	Avenue Plantation	50.0	50.0	0.0	0.0	0.0
	Bald Hill Plantation	42.9	57.1	0.0	0.0	0.0
	Block Plantation	66.7	33.3	0.0	0.0	0.0
2016-17	ANR GP	0.0	100.0	0.0	0.0	0.0
	Bamboo plantation	100.0	0.0	0.0	0.0	0.0

Table 3.9: Ranking of Mean Maximum GBH/GCH of Plants by Plantation Types

Year	Plantation Types	Ranking of Mean Max. GBH/GCH (in Cm.) of Plants in Sites (% Distribution)							
		1	2	3	4	5	6	7	8
		<5	>5 & <=10	>10 & <=20	>20 & <=30	>30 & <=45	>45 & <=60	>60 & <=80	>80 & <=100
2009-10	Block Plantation	1.3	0.0	2.6	24.4	46.2	16.7	9.0	0.0
2010-11	ANR GP	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
	Block Plantation	0.0	0.0	3.3	16.7	23.3	16.7	30.0	10.0
2011-12	ANR GP	0.0	0.0	33.3	20.0	13.3	33.3	0.0	0.0
	Bald Hill Plantation	0.0	0.0	0.0	25.0	25.0	50.0	0.0	0.0
2012-13	Avenue Plantation	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
2013-14	Bald Hill Plantation	0.0	0.0	0.0	33.3	66.7	0.0	0.0	0.0
2014-15	ANR GP	0.0	6.1	51.0	32.7	10.2	0.0	0.0	0.0
2015-16	ANR GP	10.0	10.0	31.7	28.3	20.0	0.0	0.0	0.0
	Avenue Plantation	0.0	0.0	0.0	83.3	16.7	0.0	0.0	0.0
	Bald Hill Plantation	0.0	0.0	14.3	57.1	28.6	0.0	0.0	0.0
	Block Plantation	33.3	0.0	66.7	0.0	0.0	0.0	0.0	0.0
2016-17	ANR GP	0.0	0.0	50.0	50.0	0.0	0.0	0.0	0.0
	Bamboo plantation	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0





Table 3.10: Ranking of Mean Minimum GBH/GCH of Plants by Plantation Types

Year	Plantation Types	Ranking of Mean Min. GBH/GCH (in Cm.) of Plants in Sites (% Distribution)					
		1	2	3	4	5	6
		<5	>5 & ≤10	>10 & ≤20	>20 & ≤30	>30 & ≤45	>45 & ≤60
2009-10	Block Plantation	1.3	7.7	53.8	23.1	12.8	1.3
2010-11	ANR GP	0.0	0.0	0.0	0.0	100.0	0.0
	Block Plantation	0.0	3.3	30.0	33.3	33.3	0.0
2011-12	ANR GP	0.0	6.7	53.3	40.0	0.0	0.0
	Bald Hill Plantation	0.0	0.0	75.0	0.0	25.0	0.0
2012-13	Avenue Plantation	0.0	33.3	66.7	0.0	0.0	0.0
2013-14	Bald Hill Plantation	0.0	0.0	83.3	16.7	0.0	0.0
2014-15	ANR GP	26.5	49.0	24.5	0.0	0.0	0.0
2015-16	ANR GP	21.7	41.7	26.7	10.0	0.0	0.0
	Avenue Plantation	0.0	50.0	50.0	0.0	0.0	0.0
	Bald Hill Plantation	0.0	57.1	28.6	14.3	0.0	0.0
	Block Plantation	33.3	33.3	33.3	0.0	0.0	0.0
2016-17	ANR GP	0.0	0.0	100.0	0.0	0.0	0.0
	Bamboo plantation	100.0	0.0	0.0	0.0	0.0	0.0





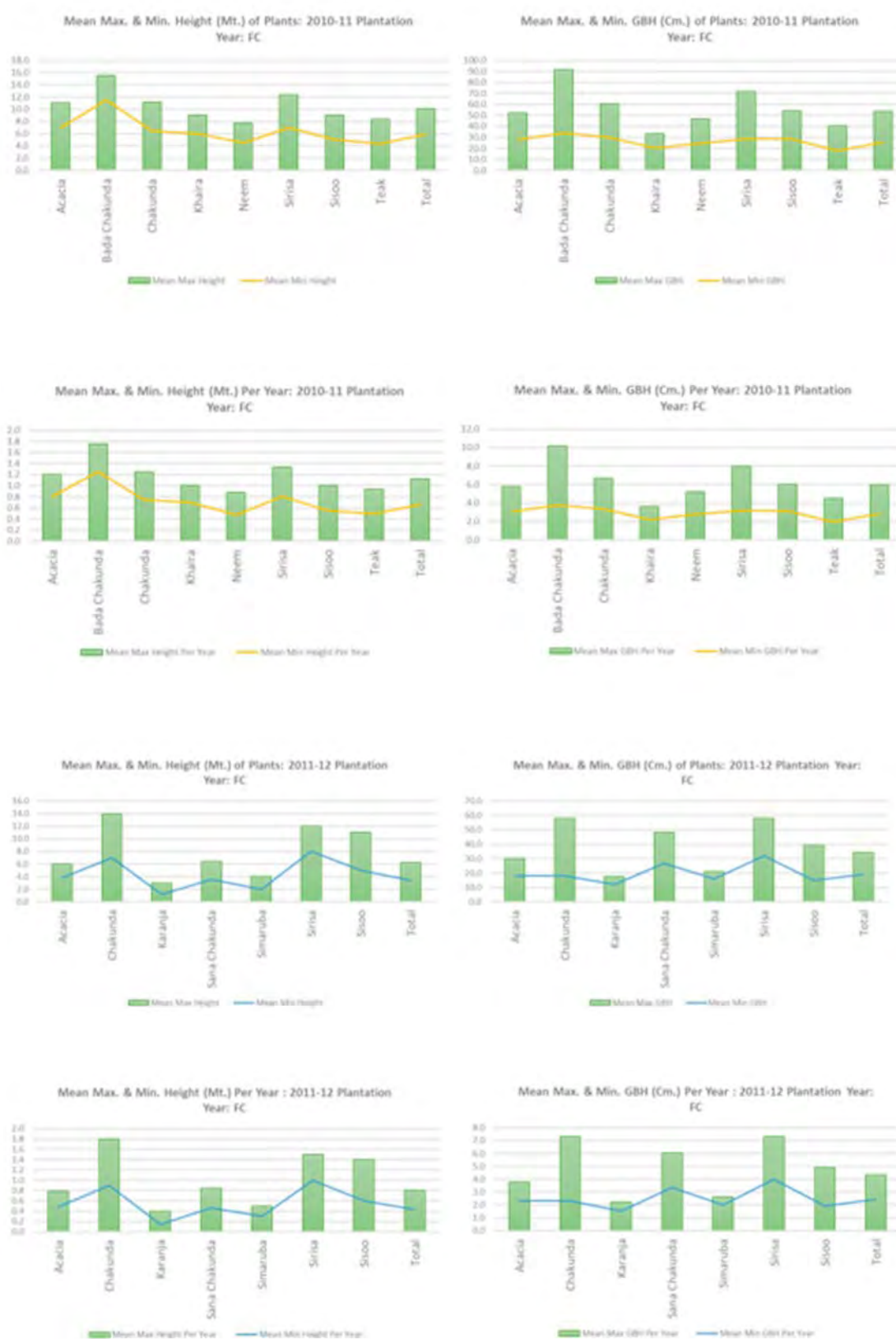


Figure 3:24: Mean Max. & Min. Height and GBH/GCH of Plants by Species

It is observed during assessment that there is difference in height and girth of the plants by species, apart from year of plantation and type of plantation. Plant species like Australian teak, Sirisa, Chakunda and Acacia mangium found higher height in comparison to other species. Plant specific height (in mt.) and GBH/GCH (in cm.) of the plants along with year of plantation is presented in the figures.







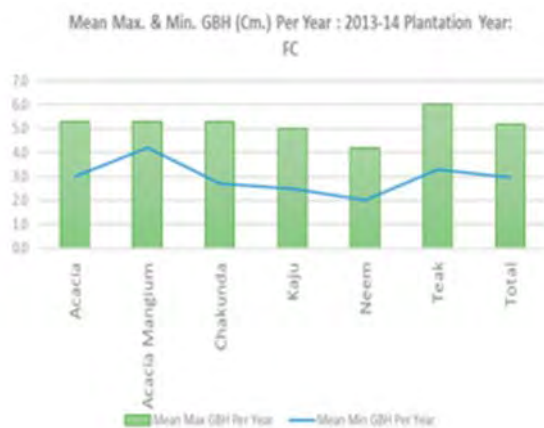
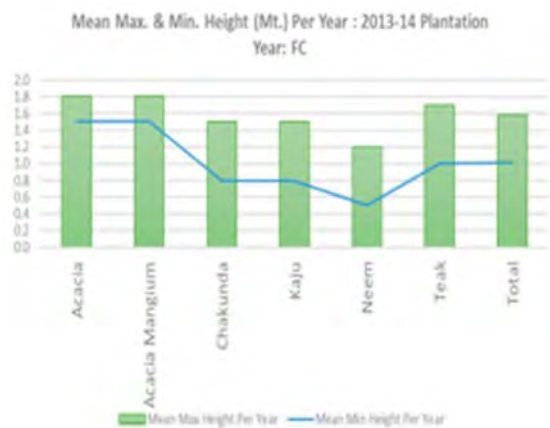
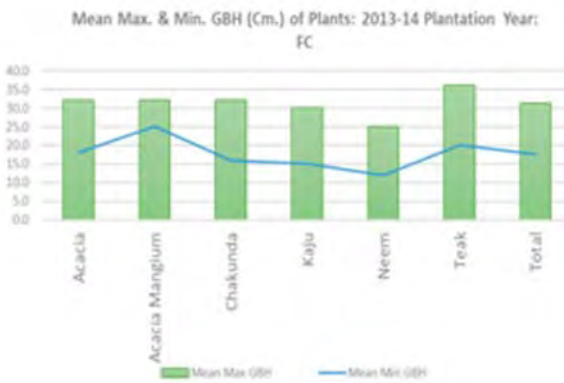
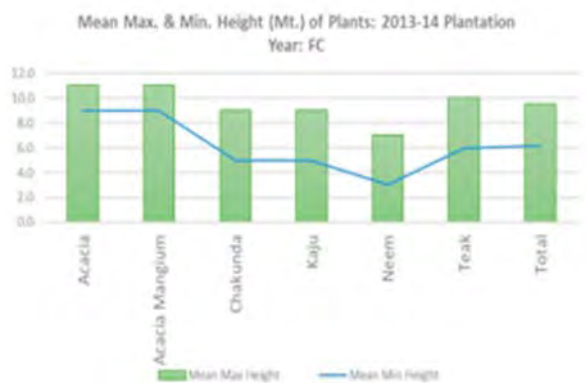
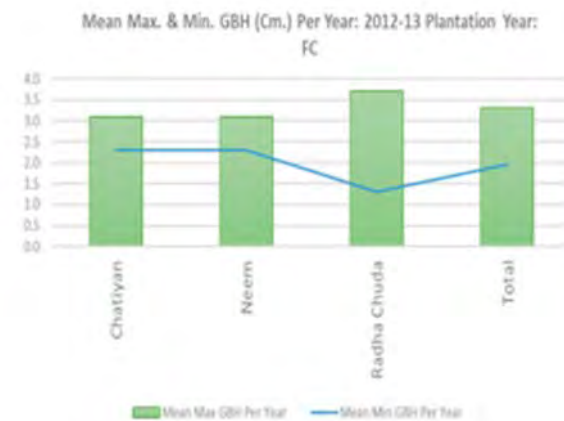
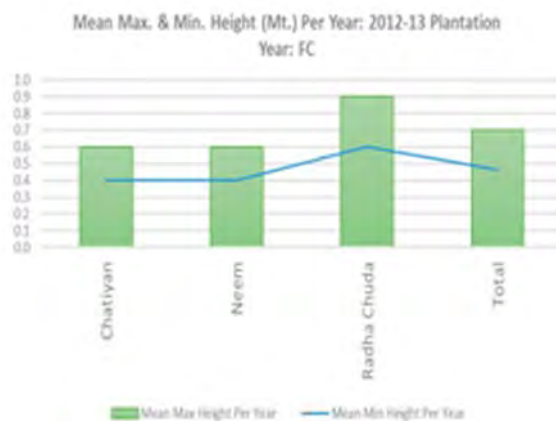
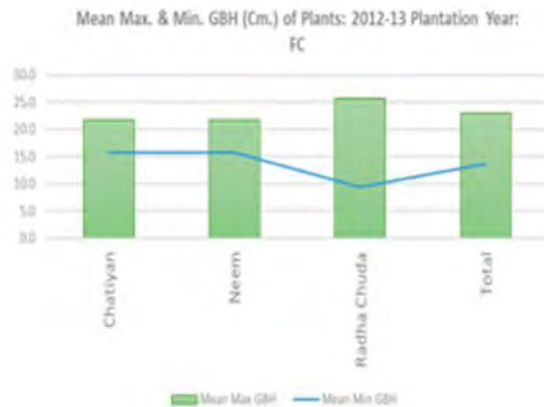
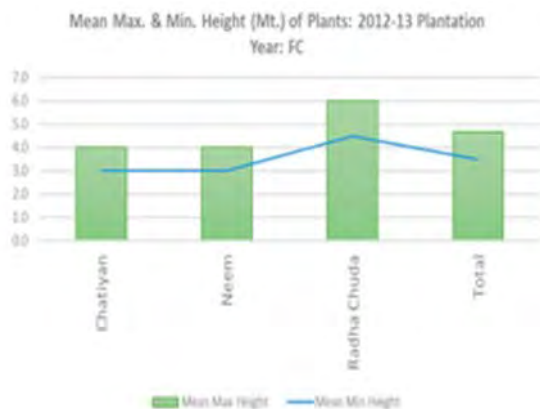






Figure 3:25: Mean Max. &amp; Min. Height &amp; GBH/GCH of Plant Species by Plantation Year



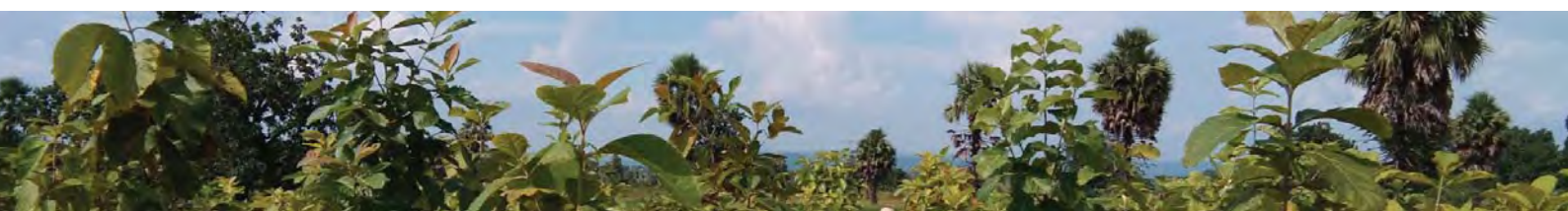
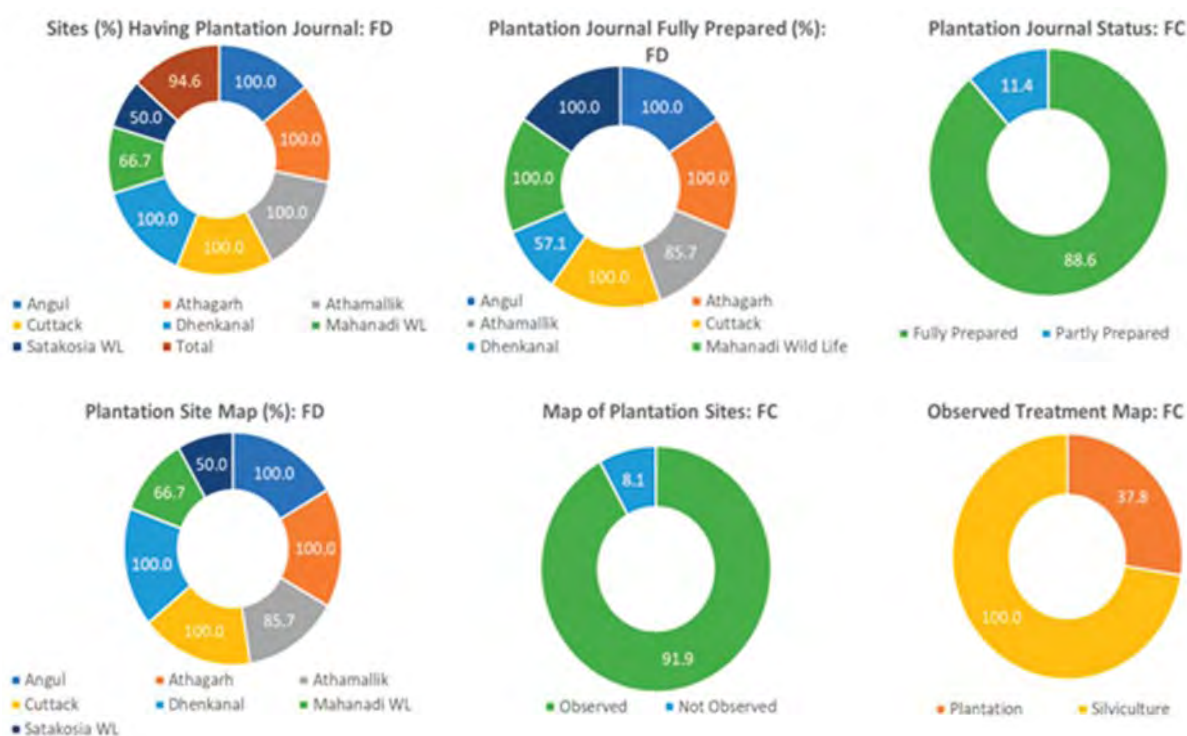
### 3.12 Plant Protection Measures:

Different plant protection measures have been taken in all the forest divisions to improve plant survival rate. Plant protection measures taken are like fencing, fire protection measures, watch and ward etc. In certain cases, villages and VSS have been found taking care of the local forest area and plantation sites. At the circle level, covering all the forest divisions, it is found that high emphasis is given to watch and ward among all the protection measures. For old plantations (like plantation of 2009-10), watch and ward provision was made for three years, excluding the plantation year. In the later stage, the site was covered under general monitoring and supervision. But for the plantations taken up in 2016-17 and 2017-18, watch and ward observed at the site level. In specific cases, fire protection measures have also been taken. Fencing is done in specific cases, i.e., bald hill plantation along with green fencing.

### 3.13 Record Keeping and Documentation:

Different records / documents are maintained at the range office level with respect to plantation / silvicultural activities, such as plantation journal, plantation site map, treatment map and other registers. Plantation journal is observed for 94.6 percent plantation sites, covering all the forest divisions of the circle. Journal for plantation activities found for all the sites in case of Angul forest division, Athagarh forest division, Athamallik FD, Cuttack FD and Dhenkanal FD. Plantation journal observed for 66.7 percent sites in Mahanadi WL and in 50.0 percent sites in Satakosia WL. About 91.9 percent sites, across different forest divisions, have plantation site map and map of all the plantation sites found in Angul, Athagarh, Cuttack and Dhenkanal.

Micro plan is found not prepared in all the forest divisions for most of the sites which includes plantation and/or silvicultural operations. Micro plan is not observed in most of the cases, excluding sites covered under AJY. Whereas, treatment map observed for 37.8 percent plantation sites and all sites (100.0 percent) covered under silvicultural operations have treatment map. Register found maintained in 60.0 percent silviculture sites. Details are presented in the diagram.





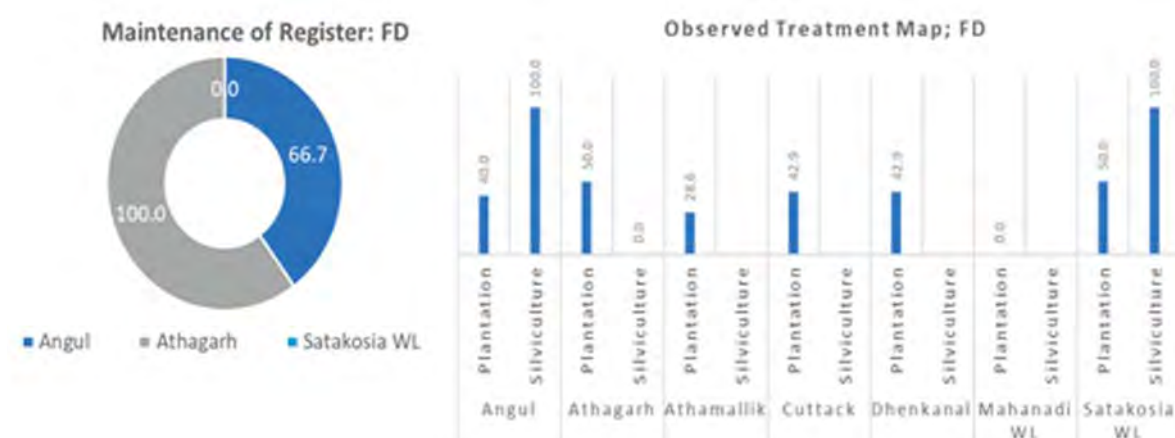


Figure 3:26: Different Records Maintained

### 3.14 Ama Jungle Yojna

Out of seven forest divisions in Angul circle, AJY is promoted under CAMPA in two forest divisions Angul and Satakosia WL. Basing on the information obtained from two sample AJYs, it is found that all the functioning VSSs involved in AJY are adhering CAMPA guidelines in their day to day operations. There are pre-plannings before undertaking plantation activities. The VSS members were found involved in various stages of activities. They maintain good relationship with forest department officials.

Table 3.11: Type of Involvement in Plantation Activities

Sl. No.	Name of the VSS / Division/ Section/ Beat/ Village	Number of Sampled out VSSs					
		Following CAMPA guidelines	Pre planning	Involvement in various stages	Proper Project planning	Proper Project Implementation Plans	Good relationship and cooperation with department people
1	Balarampur VSS Angul/ Kanhia/ Kania 2/ Sapakata/ Balarampur	Yes	Yes	Yes	Yes	Yes	Yes
2	Dandabahal VSS Satakosia WL / Purunakote/ Baghamunda/ Baghamunda B/ Dandabahal	Yes	Yes	Yes	Yes	Yes	Yes

#### 3.14.1 Practices followed

It was found that the VSSs are regularly conducting meetings and attendance rate in the meetings is found good. Records and registers are properly maintained. The wage payment for the labourers is made in cash and on daily basis.

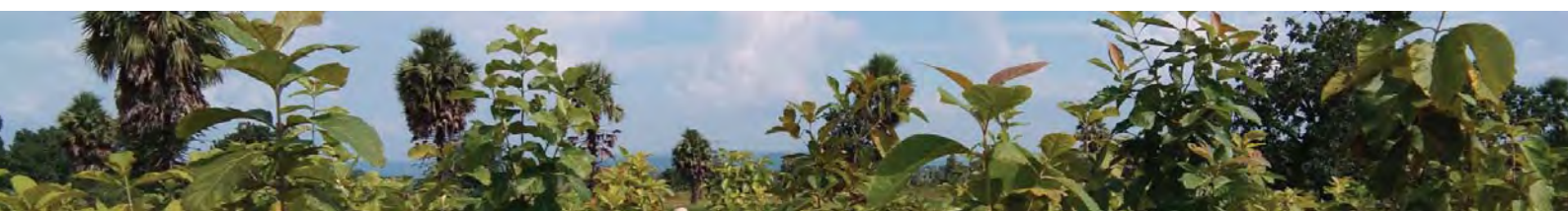


Table 3.12: Practices followed by VSSs for AJY led Plantation

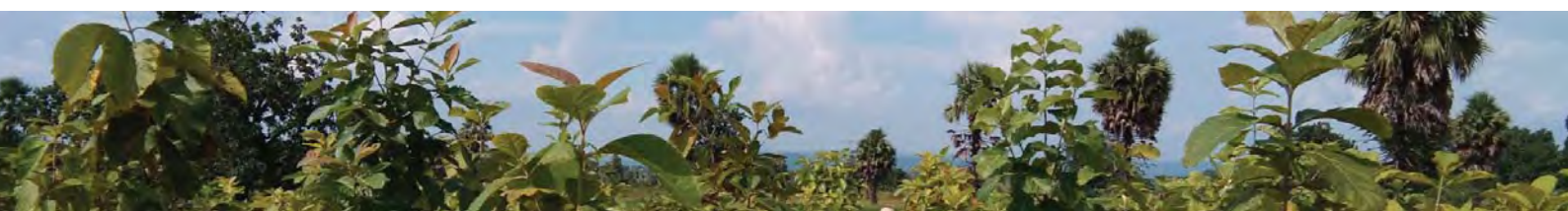
Sl. No	Name of the VSS / Division/ Range/ Section/ Beat/ Village	Frequency of JFM meeting	Attendance rate in meeting	Held of awareness prog	Maintenance of VSS Register	Wage payment system	Mode of payment
1	Balarampur VSS Angul/ Kanhia/ Kania 2/ Sapakata/ Balarampur	Always	Good	Yes	Properly maintained	Daily	Cash
2	Dandabahal VSS Satakosia WI / Purunakote/ Baghamunda/ Baghamunda B/ Dandabahal	Always	Good	Yes	Properly maintained	Daily	Cash

### 3.14.2 Impacts of CAMPA

Due to CAMPA support, status of plantation is found to have been improved in all the VSS areas, and frequency of forest fire incidences is rarely witnessed, there is no Podu cultivation which was practiced by the villagers previously. Frequency of human animal conflict is rarely reported. Due to CAMPA supported plantation and SMC works, water level in forest fringe villages tended to increase.

Table 3.13: Impact of CAMPA

Sl. No	Name of the VSS /Division/ Range/ Section/ Beat/ Village	Mode of protection of plantation	Frequency of fire incident	Practice of Podu cultivation	Wild animal visit	Mitigation plan for human animal conflict	Frequency the human Animal conflict	Change of water level after plantation under CAMPA
1	Balarampur VSS Angul/ Kanhia/ Kania 2/ Sapakata/ Balarampur	Labour	Never	No	No	No	Never	Increased
2	Dandabahal VSS Satakosia WI / Purunakote/ Baghamunda/ Baghamunda B/ Dandabahal	Labour	Never	No	Yes	Yes	No	Increased





### 3.15 Assessment Observations:

Forest Circle: Angul

Forest Division: Angul

Table 3.14: Observations: Angul Forest Division

Type of Assets	Observations
<b>Bald Hill Plantation (Bantala/ Kanja/ Pokatunga)</b>	<ol style="list-style-type: none"> <li>1. Through plantation, the bald hill is being converted to a green hill;</li> <li>2. Regeneration of Chakunda observed good in the site;</li> <li>3. Interference of the local people / community observed less due to the situated forest beat;</li> <li>4. Some natural species like Khakada, Kumbhui, Firinga and Kendu also observed in the site;</li> <li>5. Under SMC works, staggered trenches have been constructed and siltation measured to be around 40.0 percent;</li> <li>6. Due to plantation, green cover in the area has increased.</li> </ol>
<b>SSO Bamboo (Bantala/ Kanja/ Kanja)</b>	<ol style="list-style-type: none"> <li>1. This site is situated near to a water body;</li> <li>2. Most of clumps are packing of stone &amp; soil;</li> <li>3. Wild boars have been instrumental in damaging the culms;</li> <li>4. Due to silvicultural operations plant density has increased.</li> </ol>
<b>ANR with gap Plantation (Chhendipada/ Raighar/ Jamunda)</b>	<ol style="list-style-type: none"> <li>1. This plantation site is situated nearer to the agriculture field;</li> <li>2. Regeneration of Barada observed to be good;</li> <li>3. Barada and Neem are the common natural species observed in the site;</li> <li>4. This ANR activity has been protecting the area from encroachment and increasing the forest coverage.</li> </ol>
<b>Block Plantation (Chhendipada/ Chhendipada/ Chhendipada)</b>	<ol style="list-style-type: none"> <li>1. This plantation site is situated besides the road for which it is easily approachable by the outsiders;</li> <li>2. Survival &amp; quality of the plants observed to be good</li> <li>3. Soil erosion is controlled in the site due to SMC works;</li> <li>4. Growth / survival of Simaruba plant observed to be good;</li> <li>5. Through plantation, the barren land has been changed to a green forest.</li> </ol>
<b>SSO Timber (Chhendipada/ Raijharan/ Raijharan)</b>	<ol style="list-style-type: none"> <li>1. SMC work, i.e., LBCD structures found in a good condition;</li> <li>2. This forest basically a Sal forest;</li> <li>3. Different natural species found in the forest, like Sal, Mahula, Dhaura, Chara, Asana, Bahada, Kakhada, etc.;</li> <li>4. Due to SSO, valuable natural species found growing.</li> </ol>
<b>ANR without Gap – AJY (Kaniha/ Kaniha 2/ Sapakata)</b>	<ol style="list-style-type: none"> <li>1. Natural trees like Sal, Mahula, Asana, Dhaura, etc. are observed in the site;</li> <li>2. Local people are conscious about protection of the forest;</li> <li>3. The local VSS is actively involved in forest protection activities for which the forest is having good plant density;</li> <li>4. Due to maintenance works, soil moisture regime of the site has improved. It is reported that there has been a positive change in the wild animal population in the forest.</li> </ol>
<b>Block Plantation (Kaniha/ Kaniha 2/ Sapakata)</b>	<ol style="list-style-type: none"> <li>1. Regeneration of Acacia is observed in the site;</li> <li>2. Soil condition is poor due to rocky surface;</li> <li>3. In plantation, 2.5m spacing has been maintained.</li> </ol>
<b>ANR with gap Plantation (Kaniha/ Kaniha 2/ Dalak)</b>	<ol style="list-style-type: none"> <li>1. Plant survival observed to be good in the site;</li> <li>2. Gambhari trees were replaced in 1st year as replacement measure due to high casualty after planting operation;</li> <li>3. Species diversity is observed in the plantation site;</li> <li>4. Green cover in the area has increased after plantation.</li> </ol>



Forest Circle: Angul  
Forest Division: Athagarh

Table 3.15: Observations: Athagarh Forest Division

Type of Assets	Observations
<b>Block Plantation (Athagarh/ Tigiria / Tigiria)</b>	<ol style="list-style-type: none"> <li>1. Block plantation has increased the green cover in the locality and has reduced soil erosion;</li> <li>2. Survival of Chakunda tree found comparatively better;</li> <li>3. During plantation, 2.5m spacing has been maintained.</li> </ol>
<b>ANR with gap Plantation (Athagarh/ Tigiria / Tigiria)</b>	<ol style="list-style-type: none"> <li>1. The plantation activity covers plantation of medicinal plant species in around 20 ha. of area;</li> <li>2. Bamboo fencing is done for plant protection;</li> <li>3. Natural species found in the site like Chakunda;</li> <li>4. Removal of weed and unwanted bush is required.</li> </ol>
<b>SSO Bamboo (Narsinghpur East/ Devabhuin/ Devabhuin)</b>	<ol style="list-style-type: none"> <li>1. Stone packing found degraded / broken in some places;</li> <li>2. Regeneration of new culms observed in the site;</li> <li>3. Bamboo is being used as elephant fodder;</li> <li>4. Plant density has increased in the site.</li> </ol>
<b>ANR with gap Plantation (Badamba/ Badamba/ Khalimati)</b>	<ol style="list-style-type: none"> <li>1. Poor soil quality to some extent effect proper plant growth (Morum type soil). However natural regeneration of different species observed like Kendu, Sal, Chara, Mahula etc. in the site.</li> </ol>
<b>Block Plantation (Narsinghpur East/ Narsinghpur / Narsinghpur)</b>	<ol style="list-style-type: none"> <li>1. Elephants have been damaging the sites during their movement;</li> <li>2. Illegal felling of trees by the locals is reported and hence proper protection seems a requirement for the existing trees;</li> </ol>
<b>ANR with gap Plantation (Narsinghpur East/ Devabhuin/ Jadapada)</b>	<ol style="list-style-type: none"> <li>1. Regeneration of natural species is observed;</li> <li>2. It is observed that maximum number of teaks is planted as compared to other species.</li> </ol>

Forest Circle: Angul  
Forest Division: Athamallik

Table 3.16: Observations: Athamallik Forest Division

Type of Assets	Observations
<b>Block Plantation (Bamur/ Kadalimunda/ Tentalapai)</b>	<ol style="list-style-type: none"> <li>1. Block Plantation is done near to the natural Sal forest.</li> </ol>
<b>Block Plantation (Bamur/ Kadalimunda/ Tentalapai)</b>	<ol style="list-style-type: none"> <li>1. Before plantation, the land was encroached by local people and used for farming;</li> <li>2. After CAMPA interventions, several meetings were organised by local forest officials with the community and the land was released for plantation;</li> <li>3. Now, the area is covered under block plantation which is expected to grow and increase the green cover in the coming days.</li> </ol>
<b>ANR with gap Plantation (Bamur/ Kishor Nagar/ Himtira)</b>	<ol style="list-style-type: none"> <li>1. Mostly natural species are dominating the area like Kedu, Chara, Sal, Mahula, etc.</li> <li>2. Due to ANR activity, valuable species are growing well.</li> </ol>





Type of Assets	Observations
<b>ANR with gap Plantation (Madhapur/ Kiakata/ Ghodagadi)</b>	<ol style="list-style-type: none"> <li>1. Natural species observed which includes Kumbi, Bamboo, Mahula, Nimba, Bahada;</li> <li>2. After gap planting, green cover in the area has increased as compared to previous years.</li> </ol>
<b>Block Plantation (Madhapur/ Kiakata/ Ghodagadi)</b>	<ol style="list-style-type: none"> <li>1. The site is having natural species like Dhaura, Asana, Dhara, Mahula, Sala, Rohani, Kendu, Char, Mahi etc.;</li> <li>2. The plantation site is located near the agricultural farm and hence human interference is expected;</li> <li>3. Block plantation has improved the green cover of the area.</li> </ol>
<b>Block Plantation (Handapa/ Handapa/ Handapa)</b>	<ol style="list-style-type: none"> <li>1. The site is hilly which seems more suitable for ANR activity;</li> <li>2. Due to plantation activity, green cover has been increasing.</li> </ol>
<b>Avenue Plantation (Handapa/ Urkala/ Tileswar)</b>	<ol style="list-style-type: none"> <li>1. Growth of the plants observed good with less casualty;</li> <li>2. Growth of Radhachuda plant found better in comparison to others plants;</li> <li>3. Avenue plantation has reduced top soil erosion from the road side.</li> </ol>

Forest Circle: Angul

Forest Division: Cuttack

Table 3.17: Observations: Cuttack Forest Division

Type of Assets	Observations
<b>ANR with gap Plantation (Sukinda/ Sukinda/ Sukinda)</b>	<ol style="list-style-type: none"> <li>1. Before CAMPA intervention, the site was completely barren;</li> <li>2. The site is now covered under plantation activity;</li> <li>3. Growth of trees observed good in the side;</li> <li>4. Other natural species available in the site are Sal, Mahula and Kendu etc.</li> </ol>
<b>Block Plantation (Sukinda/ Sukinda/ Haripur)</b>	<ol style="list-style-type: none"> <li>1. The site is located at Bairamal block and plantation was done in a revenue forest land;</li> <li>2. The site is having hard soil which is less suitable for plant growth.</li> </ol>
<b>Bald Hill Plantation (Sukinda/ Sukinda/ Haripur)</b>	<ol style="list-style-type: none"> <li>1. Green fencing and pillars are observed for protection of the plantation site.</li> </ol>
<b>Block Plantation (Dalijoda/ Chandikhol/ Chndikhol)</b>	<ol style="list-style-type: none"> <li>1. Protection measures have reduced illicit felling of trees;</li> <li>2. Survival &amp; quality of all plants found good;</li> <li>3. With the increase in plant cover, soil erosion has reduced in the site.</li> </ol>
<b>Bald Hill Plantation (Dalijoda/ Bairi/ Bairi)</b>	<ol style="list-style-type: none"> <li>1. Bald Hill plantation covers two village forests;</li> <li>2. Green fencing is provided in the site for plant protection;</li> <li>3. Bamboo is taken for green fencing at some place.</li> </ol>
<b>ANR with gap Plantation (Tamka/ Kansa/ Kansa (A))</b>	<ol style="list-style-type: none"> <li>1. This site is coming under Tungeisuni RF;</li> <li>2. Soil erosion found reduced due to gap plantation measures;</li> <li>3. Dominant species in the site is Teak;</li> <li>4. Natural species observed are Sal, Kednu and Mahula;</li> <li>5. Through ANR and enrichment plantation, degraded forest is being converted to a green forest.</li> </ol>
<b>Avenue Plantation (Tamka/ Tamka/ Gobardhanpur)</b>	<ol style="list-style-type: none"> <li>1. Avenue plantation is taken up beside the road from Phuljhari to Bangarkote;</li> <li>2. Growth of trees found good in observed sites.</li> </ol>



Forest Circle: Angul

Forest Division: Dhenkanal

Table 3.18: Observations: Dhenkanal Forest Division

Type of Assets	Observations
<b>ANR with gap Plantation (Sadangi/ Sadangi/ Kasipur)</b>	<ol style="list-style-type: none"> <li>1. Mostly natural species are observed like Sal, Kendu and Mahula;</li> <li>2. Plant diversity is observed and SMC work has been done;</li> <li>3. Natural regeneration of plants has happened which has contributed to green cover increase.</li> </ol>
<b>Block Plantation (Sadangi/ Sadangi/ Sandangi)</b>	<ol style="list-style-type: none"> <li>1. This plantation site is situated near the local habitation;</li> <li>2. Plantation has been damaged due to cyclone (Fani) for which plant survival rate observed low.</li> </ol>
<b>Bamboo plantation (Hindol/ Hindol/ Hindol)</b>	<ol style="list-style-type: none"> <li>1. Plantation (gap filling) is done in the natural forest;</li> <li>2. All bamboo plants measured to be below 1 metre;</li> <li>3. The site also having natural species like Sal, Asan, Dhaura etc.;</li> <li>4. Growth of bamboo is low due to shadow of natural forest.</li> </ol>
<b>Block Plantation (Hindol/ Dandari/ Gurujangu)</b>	<ol style="list-style-type: none"> <li>1. The site observed to be well maintained;</li> <li>2. Green coverage in the area has improved due to plantation;</li> <li>3. Spacing is maintained during plantation.</li> </ol>
<b>ANR with gap Plantation (Hindol/ Dandari/ Gurujangu)</b>	<ol style="list-style-type: none"> <li>1. Well maintained plantation site;</li> <li>2. Natural species found which includes Siddha, Asana, Dhaura, Barakoli.</li> </ol>
<b>Block Plantation (Sadar/ Sadar/ Mahisapat)</b>	<ol style="list-style-type: none"> <li>1. Well maintained plantation site;</li> <li>2. During plantation, 2.5m spacing has been maintained.</li> </ol>
<b>ANR with gap Plantation (Sadar/ Sadar/ Mahisapat)</b>	<ol style="list-style-type: none"> <li>1. Well maintained plantation site;</li> <li>2. Plant species diversity is maintained;</li> <li>3. SMC work has been done in the site for soil moisture conservation.</li> </ol>

Forest Circle: Angul

Forest Division: Mahanadi Wild Life

Table 3.19: Observations: Mahanadi Wild Life

Type of Assets	Observations
<b>Block Plantation (Banigochha East/ Taker/ Taker)</b>	<ol style="list-style-type: none"> <li>1. The plantation site is situated near by the village Badasilinga and besides the local road;</li> <li>2. Plantation journal not available as it was destroyed at the time of attack by the left-wing extremists at the range office;</li> <li>3. No sign board observed at plantation sites;</li> <li>4. Retarded growth of plants observed due to the poor soil quality (high murom content in the soil);</li> <li>5. The land was barren before plantation which is now converted to a forest.</li> </ol>
<b>Block Plantation (Chhamundia/ Chhamundia/ Rajinji)</b>	<ol style="list-style-type: none"> <li>1. The site is situated besides the local human habitation;</li> <li>2. Well growth of Sana Chakunda plant observed in the site;</li> <li>3. Local villagers are involved in protection of the site;</li> <li>4. The land was barren before plantation which is now converted to a green cover.</li> </ol>
<b>Block Plantation (Kusanga/ Kusanga/ Nuapada)</b>	<ol style="list-style-type: none"> <li>1. This site is situated near by the human habitation</li> <li>2. Plantation was done on a plane area with spacing of 2.5m*2.5m.</li> <li>3. Growth of plantation observed to be good due to sandy clay soil;</li> <li>4. Plantation activity has improved forest cover in the area.</li> </ol>





**Forest Circle:** Angul

**Forest Division:** Satakosia Wild Life

*Table 3.20: Observations: Satakosia Wild Life*

Type of Assets	Observations
<b>Block Plantation (Tikarpada/ Majhipada/ Naleswar)</b>	<ol style="list-style-type: none"> <li>1. The site is plain and the plantation has been done inside an existing natural forest;</li> <li>2. Some natural species observed in the site;</li> <li>3. In plantation, 2.5m spacing has been maintained;</li> <li>4. Soil conservation measures have been beneficial in arresting top soil erosion;</li> <li>5. Plantation and maintenance measures have improved green cover in the locality.</li> </ol>
<b>ANR with gap Plantation (Pampasara/ Kumari/ Hinjadali)</b>	<ol style="list-style-type: none"> <li>1. Sana Chakunda has been the major plant species in the site;</li> <li>2. Kendu, Bela, Bahada, Asana and Bamboo are the observed natural species;</li> <li>3. Bela and Kendu are more regenerated species in the site;</li> <li>4. It is observed that survival of Sana Chakunda is relatively higher;</li> <li>5. Once it was a degraded forest which is now converted to a green cover;</li> <li>6. Soil conservation measures have been taken which has reduced top soil erosion.</li> </ol>
<b>ANR without gap – AJY (Purunakote/ Baghamunda/ Baghamunda)</b>	<ol style="list-style-type: none"> <li>1. The local VSS (Dandabahali VSS) found to be active and associated in forest protection activities;</li> <li>2. Increased regeneration of different species in the site due to the AJY intervention;</li> <li>3. The villagers unitedly protecting the Dandabahali forest</li> <li>4. Forest department provide adequate support to VSS for their functional improvement;</li> <li>5. Sal, Asan, Mahula, Kendu, Sidha, Chara, Tentala, Sishu and Mahi are different species available in this forest;</li> <li>6. Overall quality of forest has improved due to community involvement along with the forest department officials.</li> </ol>



### 3.16 Infrastructural Facilities:

Table 3.21: Usability of buildings

Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
1	Range office Satakosia Wild Life / Tikarpada/ Tikarpada / Tikarpada	<ul style="list-style-type: none"> <li>One range officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply etc. are available.</li> <li>This building is fully tile flooring.</li> </ul>	<ul style="list-style-type: none"> <li>Become more convenient to implement the office and field work compared to earlier situation.</li> </ul>	8	High
2	Range officer's quarter Satakosia Wild Life/ Tikarpada/ Tikarpada/ Tikarpada	<ul style="list-style-type: none"> <li>Two bed rooms, one drawing room, kitchen, toilet, dining hall, electricity, pipe water supply and boundary wall</li> </ul>	<ul style="list-style-type: none"> <li>Better residential facilities for range officer helped him for improved work performance.</li> </ul>	7	High
3	Staff Barrack Satakosia Wild Life/ Tikarpada/ Tikarpada/ Tikarpada	<ul style="list-style-type: none"> <li>Two storage building, toilet, One hall on the 1st floor, steps, One room on the ground floor, pipe water supply, overhead tank, electricity etc.</li> <li>Patrolling staffs are staying here, among them 3 staffs are staying regularly</li> </ul>	<ul style="list-style-type: none"> <li>Due to the staff barrack, staffs enabled doing patrolling work smoothly.</li> </ul>	8	High
4	Forest Guard Quarter Satakosia Wild Life/ Tikarpada/ Majhipada/ Naleswar	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet</li> <li>There should be drinking water and electricity electricity facility.</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard is staying in this quarter for which he is able to perform his regular duties timely.</li> <li>Helped ready availability of forest guard at plantation sites as per the need.</li> </ul>	5	Medium





Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
5	Range office Satakosia Wild Life / Pampasara/ Pampasar/ Pampasara-A	<ul style="list-style-type: none"> <li>One range officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>The forest work managed easily.</li> <li>Facilitated direct supervision of the Range officer in field activities.</li> <li>Information sharing among staff became easy within a short period of time.</li> </ul>	9	High
6	Range officer's quarter Satakosia Wild Life/ Pampasara/ Pampasar/ Pampasara-A	<ul style="list-style-type: none"> <li>Two bed rooms, one drawing room, kitchen, toilet, dining hall, electricity, pipe water supply and boundary wall</li> <li>Range officer's quarter adjacent to the range office.</li> <li>This building is fully tile flooring.</li> </ul>	<ul style="list-style-type: none"> <li>Enabled the Range officer to stay nearer to his own forest area and perform his duties in better manner.</li> </ul>	9	High
7	Forest Guard Quarter Satakosia Wild Life/ Pampasara/ Kumuri/ Kumuri-A	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet and electricity.</li> <li>It is a small quarter with electricity only, but there is no better water facility available.</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forest guard to stay in the forest itself. Spred more time towards the Forest development work</li> </ul>	6	Medium
8	Staff Barrack Satakosia Wild Life/ Pampasara/ Pampasar/ Pampasar-A	<ul style="list-style-type: none"> <li>Two storage building, Garage, toilet, One hall on the 1st floor, steps, One room on the ground floor, pipe water supply, overhead tank, electricity etc.</li> <li>But currently no use of this building due to another camp shed is available.</li> </ul>		3	Low
9	Anti poaching Shed Satakosia Wild Life/ Pampasara/ Tamaka/ Tarabha-A	<ul style="list-style-type: none"> <li>Single storage building with solar system and VHF</li> <li>Due to this anti poaching shed and squad minimize the poaching case</li> </ul>	<ul style="list-style-type: none"> <li>One forest guard and four anti-poaching squads are staying in this building and the asset helped squad to undertake timely patrolling to check anti poaching activities.</li> </ul>	7	High



Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
10	Range office Satakosia Wild Life/ Purunakote/ Purunakote/ Purunakote	<ul style="list-style-type: none"> <li>One range officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply etc. are available.</li> <li>A well-furnished building with all facilities including electricity and sanitation. It has become easy for official works as well as the management work from the forest area.</li> </ul>	<ul style="list-style-type: none"> <li>The direct supervision of the Range officer made easily.</li> <li>Become more convenient to operate from the current office compared to earlier building leading to greater work efficiency.</li> </ul>	8	High
11	Range officer's quarter Satakosia Wild Life/ Purunakote/ Purunakote/ Purunakote	<ul style="list-style-type: none"> <li>Two bed rooms, one drawing room, kitchen, toilet, dining hall, electricity, pipe water supply and boundary wall</li> <li>Range officer's quarter adjacent to the range office.</li> <li>This building is fully tile flooring.</li> </ul>	<ul style="list-style-type: none"> <li>It enabled the Range officer to stay nearer to his own forest area and perform his duty in a better manner.</li> </ul>	8	High
12	Forester office-cum-residence Satakosia Wild Life/ Purunakote/ Baghamunda/ Baghamunda -A	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet, electricity and open well for drinking water etc.</li> <li>An Office -cum- residential quarter with all required facilities. It helped the forester to keep a direct eye on the forest development work.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building section office work done smoothly and properly.</li> </ul>	8	High
13	Forest Guard Quarter Satakosia Wild Life/ Purunakote/ Baghamunda/ Baghamunda-C	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet, electricity and water availability</li> <li>Used as a forest guard quarter</li> <li>It is a well-furnished building</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard is staying here and abled to give more time for plantation activities.</li> </ul>	8	High
14	Staff Barrack Satakosia Wild Life/ Purunakote/ Tuluka North/ Tuluka - B	<ul style="list-style-type: none"> <li>Two storey building, three rooms, elephant protect trench, solar system and open well for drinking water.</li> <li>Due to this anti poaching shed and squad minimize the poaching cases.</li> </ul>	<ul style="list-style-type: none"> <li>Six anti-poaching squad staying in this building.</li> <li>Used by anti-poaching squad.</li> <li>It helped to undertake quick and emergent patrolling work.</li> </ul>	9	High





Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
15	Range office Mahanadi Wild Life/ Banigochha East/ Takeru/ Takeru	<ul style="list-style-type: none"> <li>One range officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply is available.</li> <li>Previously Banigochha East range office functioning in this building, but now the range office operates at Badasilinga section office.</li> <li>In the year 2019 a Naxal attack was happened in this building. In this time they destroyed office furniture and records.</li> <li>Needs to be minimum repair and should be used by the department for any office purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Availability of buildings for smooth functioning of office and field work.</li> </ul>	6	Medium
16	Interpretation center Mahanadi Wild Life/ Banigochha East/ Takeru/ Takeru	<ul style="list-style-type: none"> <li>A hall, furniture, electricity etc. are available for meeting purposes.</li> <li>Currently used as a store room</li> <li>This building is not used as per the purpose, it should be used as an Interpretation Centre as proposed.</li> </ul>		3	Low
17	Forester office-cum-residence Mahanadi Wild Life/ Banigochha East/ Badasilinga/ Badasilinga	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet, electricity and solar light system etc.</li> <li>Required water supply</li> </ul>	<ul style="list-style-type: none"> <li>Used as forester residence-cum-office and it helped in smooth implementation of section work.</li> </ul>	6	Medium
18	Forest Guard Quarter Mahanadi Wild Life/ Banigochha East/ Badasilinga/ Badasilinga	<ul style="list-style-type: none"> <li>One bed room, one store room, one kitchen</li> <li>Used as forest guard quarter</li> <li>The FG quarter situated in the premises of the Bada Salanga section office.</li> <li>Building should be repaired</li> </ul>	<ul style="list-style-type: none"> <li>Forest Guard is staying in this house and exercising the field duties.</li> </ul>	6	Medium
19	Staff Barrack Mahanadi Wild Life/ Banigochha East/ Badasilinga/ Badasilinga	<ul style="list-style-type: none"> <li>Two room and electricity</li> <li>Used as Range Office</li> <li>Needs to be repair</li> </ul>	<ul style="list-style-type: none"> <li>Currently this building is functioning as a range office</li> </ul>	6	Medium



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20	Anti poaching Shed Mahanadi Wild Life/ Banigochha East/ Dhipasahi/ Dhipasahi	<ul style="list-style-type: none"> <li>One hall with solar system and VHF tower</li> <li>Used as Anti Poaching Shed</li> <li>Five anti poaching squad staying this building.</li> <li>Required drinking water</li> </ul>	<ul style="list-style-type: none"> <li>The construction of anti poaching shed for helped in minimizing the poaching cases.</li> </ul>	6	Medium
21	Range office Mahanadi Wild Life/ Chhamundia/ Chhamundia/ Chhamundia	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> <li>Chhamundia range office is an old range office, It was constructed in the APO year 2011-12,</li> <li>It is required for repairing</li> </ul>	<ul style="list-style-type: none"> <li>Become more convenient to operate from the current office due to availability of facilities.</li> </ul>	7	Medium
22	Range officer's quarter Mahanadi Wild Life/ Chhamundia/ Chhamundia/ Chhamundia	<ul style="list-style-type: none"> <li>Two bed rooms, one drawing room, kitchen, toilet, dining hall, electricity, pipe water supply and boundary wall</li> <li>Used by Range officer</li> <li>Building condition is good</li> </ul>	<ul style="list-style-type: none"> <li>The forest work managed easily. The direct supervision of the Range officer become easy. Information sharing become easy within short period of time</li> </ul>	8	High
23	Forester office-cum-residence Mahanadi Wild Life/ Chhamundia/ Badamula/ Badamula	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet and electricity.</li> <li>Used as forester residence-cum-office</li> <li>This building is situated in the village Sripaju.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building forester is staying here and ensured his timely availability for patrolling.</li> </ul>	8	High
24	Forest Guard Quarter Mahanadi Wild Life/ Chhamundia/ Purunapani/ Purunapani	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet and electricity.</li> <li>This forest guard quarter situated in the premises of the section office.</li> <li>Forest guard used drinking water from open well which was situated in section office premises.</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard staying with their family and the asset helped him for proper execution of field activities.</li> </ul>	8	High





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25	Staff Barrack Mahanadi Wild Life/ Chhamundia/ Chhamundia/ Chhamundia	<ul style="list-style-type: none"> <li>Two storey building, garrage, toilet, one hall on the 1st floor, steps, one room on the ground floor, pipe water supply, overhead tank, electricity etc. are available.</li> <li>Building condition is very good.</li> </ul>	<ul style="list-style-type: none"> <li>Helped in Ensuring ready availability of sward for patorlling and execution of other office work.</li> </ul>	9	High
26	Boundary Wall Mahanadi Wild Life/ Chhamundia/ Purunapani/ Purunapani	<ul style="list-style-type: none"> <li>Cemented wall</li> <li>Used as boundary wall</li> <li>One steel gate is required for safety purpose.</li> </ul>	<ul style="list-style-type: none"> <li>Increased in safety of section office.</li> </ul>	5	Medium
27	Anti-poaching Shed Mahanadi Wild Life/ Chhamundia/ Dhipasahi/ Dhipasahi	<ul style="list-style-type: none"> <li>Concrete building with facilities of solar system</li> <li>Anti-poaching squad staying for watch &amp; ward</li> <li>Four anti-poaching staffs have been staying here, but they have no drinking water facility. They bring water from 2 km distance.</li> </ul>	<ul style="list-style-type: none"> <li>The construction of anti-poaching shed and deployment of squad minimized the anti-poaching and smuggling activities.</li> </ul>	7	Medium
28	Check Gate Shed/Mahanadi Wild Life/ Chhamundia/ Badamula/ Badamula	<ul style="list-style-type: none"> <li>Facilities are available for staying of gate watcher</li> </ul>	<ul style="list-style-type: none"> <li>Smooth operation of the Badamul forest check gate ensured</li> </ul>	7	Medium
29	Range office Mahanadi Wild Life/ Kusanga/ Kusanga/ Kusanga	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> <li>This building's condition is very good.</li> </ul>	<ul style="list-style-type: none"> <li>The direct supervision of the Range officer made easily.</li> </ul>	8	High
30	Range officer's quarter Mahanadi Wild Life/ Kusanga/ Kusanga/ Kusanga	<ul style="list-style-type: none"> <li>Two bed rooms, one drawing room, kitchen, toilet, dining hall, electricity, pipe water supply and boundary wall</li> <li>Used by Range officer</li> <li>Building condition is good.</li> </ul>	<ul style="list-style-type: none"> <li>Range officer is here and performing his duty with comfort in an working environment. It helped in his work efficiency.</li> </ul>	8	High



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31	Forester office-cum-residence Mahanadi Wild Life/ Kusanga/ Sripaju/ Sripaju	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet and electricity.</li> <li>Forest guard quarter also situated in this section premises.</li> <li>Used tube well for drinking water purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building forester is staying here and it enabled him in undertaking patrolling work as and when required.</li> </ul>	6	Medium
32	Forest Guard Quarter Mahanadi Wild Life/ Kusanga/ Sitalapani/ Sunakharia	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet and electricity.</li> <li>Used as forest guard quarter</li> <li>The staffs are collected water from Mahanadi river and nala</li> <li>Required drinking water facility</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard and other staffs staying here to an extent helped them in exercising their duties smoothly</li> </ul>	6	Medium
33	Boundary Wall Mahanadi Wild Life/ Kusanga/ Sitalapani/ Atalsara	<ul style="list-style-type: none"> <li>Cemented wall with steel gate</li> <li>Used as boundary wall</li> </ul>	<ul style="list-style-type: none"> <li>Increased safety and security of office building.</li> </ul>	8	High
34	Anti-poaching Shed Mahanadi Wild Life/ Kusanga/ Sitalapani/ Atalsara	<ul style="list-style-type: none"> <li>One hall, one room of single stair, toilet and Solar system were available</li> <li>Used as Anti Poaching Shed/ Barrack</li> <li>Three watchers are staying here.</li> <li>Required drinking water facility</li> </ul>	<ul style="list-style-type: none"> <li>Due to this shed/ barrack minimized the poaching and smuggling cases</li> </ul>	8	High
35	Check Gate Shed Mahanadi Wild Life/Kusanga/ Kusanga/Kumuri	<ul style="list-style-type: none"> <li>All facilities are available</li> <li>Gate watchers are staying here</li> <li>Used as a rest shed for gate operate watchers</li> </ul>	<ul style="list-style-type: none"> <li>Facilitated smooth operation of the forest check gate</li> </ul>	8	High
36	Nursery watch shed Mahanadi Wild Life/ Kusanga/ Kusanga/ Kumuri	<ul style="list-style-type: none"> <li>One room used by nursery watcher</li> <li>Due to lack of electricity they used a generator during water supply to nursery and electricity should be available</li> </ul>	<ul style="list-style-type: none"> <li>Watchers are staying here and to certain extent helped them to carryout the nursery activities.</li> </ul>	7	Medium
37	Malkhana Mahanadi Wild Life/ Kusanga/ Kusanga/ Kusanga	<ul style="list-style-type: none"> <li>One store room and open room available for store purposes</li> <li>Used as a store room for seized goods</li> <li>At the time of observation some seize goods i.e. Moter cycle, Bicycle, Kendupatra, fawda and wild animal horns were available in this seizure yard.</li> </ul>	<ul style="list-style-type: none"> <li>Availability of space for storage of seized items in safety manner</li> </ul>	8	High





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38	Range office Angul/ Bantala/ Khinda/ Pokatunga	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>The forest work managed easily. Facilitated direct supervision of the Range officer in implementation of field and office activities. Information sharing became easy within a short period of time enhancing better staff coordination.</li> </ul>	8	High
39	Range officer's quarter Angul/ Bantala/ Khinda/ Pokatunga	<ul style="list-style-type: none"> <li>Two bed rooms, one drawing room, kitchen, toilet, dining hall, electricity, pipe water supply and boundary wall</li> <li>A well furnished quarter with availability of all facilities including electricity, water and sanitation.</li> </ul>	<ul style="list-style-type: none"> <li>Enabled the Range officer to stay nearer to his own forest area and perform his duty in a better manner.</li> </ul>	8	High
40	Forester office-cum-residence Angul/ Bantala/ Kanja/ Kanja	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet.</li> <li>Forester of Kanja section is staying here. Due to this he gives more efforts for official and field work.</li> <li>Required electricity and water supply</li> </ul>	<ul style="list-style-type: none"> <li>It helped the forester to stay and perform his office &amp; supervision work in a better manner.</li> </ul>	7	Medium
41	Forest Guard Quarter Angul/ Bantala/ Kanja/ Kanja	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, and toilet.</li> <li>Forest guard of Kanja beat is staying here. Due to this he gives more efforts for official and field work.</li> <li>Required electricity and water supply</li> </ul>	<ul style="list-style-type: none"> <li>Helped the Forest Guard to stay and perform his office &amp; patrolling work in the forest area in a better manner.</li> </ul>	7	Medium
42	Range office Angul/ Chhendipada/ Chhendipada/ Chhendipada	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Direct supervision of the Range officer made easy. Besides, ensured better coordination and supervision of activities in part of range officer.</li> </ul>	8	High



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43	Range officer's quarter Angul/ Chhendipada/ Chhendipada/ Chhendipada	<ul style="list-style-type: none"> <li>Two bed rooms, one drawing room, kitchen, toilet, dining hall, electricity, pipe water supply and boundary wall</li> <li>A very nice quarter with availability of all facilities including electricity, water and sanitation.</li> </ul>	<ul style="list-style-type: none"> <li>It enabled the Range officer to stay nearer to his own forest area and perform his duty in a better manner.</li> </ul>	8	High
44	Forest Guard Quarter Angul/ Chhendipada/ Chhendipada/ Chhendipada	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet, electricity and open well for drinking water</li> <li>Forest guard of Chhendipada beat is staying here. Due to this, he gives more efforts for official and field work.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this intervention the poaching activities became reduced. Also ensured staff regularity in the duty.</li> </ul>	8	High
45	Range office Angul/ Kaniha/ Kaniha/ Kaniha	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> <li>A well furnished building with all facilities including electricity and sanitation. It has become easy for doing official works as well as the management work.</li> </ul>	<ul style="list-style-type: none"> <li>Helped to perform official work in better manner.</li> </ul>	8	High
46	Forester office-cum-residence Angul/ Kaniha/ Kaniha 2/ Hanumanpur	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet, electricity and open well for drinking water etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Due to the construction of Forester Office cum Residence, poaching activities became controlled since one forester is staying regularly and performing his responsibilities properly.</li> </ul>	8	High
47	Forest Guard Quarter Angul/ Kaniha/ Kaniha 2/ Hanumanpur	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet, electricity and drinking water etc. are available.</li> <li>It was constructed in the year 2010-11, so that needs to be repair.</li> </ul>	<ul style="list-style-type: none"> <li>Since forester and forest guard residence are situated within one boundary it helped in joint operation / patrolling.</li> </ul>	7	Medium





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48	Range office Dhenkanal/ Hindol/ Hindol/ Hindol	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> <li>A well-furnished building with all facilities including electricity and sanitation. It has become easy for doing official works as well as the management work from the forest area.</li> </ul>	<ul style="list-style-type: none"> <li>After having Range Office building all the staffs are able to work smoothly.</li> <li>Promoted better working environment.</li> </ul>	8	High
49	Range officer's quarter Dhenkanal/ Hindol/ Hindol/ Hindol	<ul style="list-style-type: none"> <li>Two bed rooms, one drawing room, kitchen, toilet, dining hall, electricity, pipe drinking water supply and boundary wall etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>It enabled the Range officer to stay nearer to his own forest area and perform his duty in a better manner.</li> </ul>	8	High
50	Range office Dhenkanal/ Dhenkanal/ Sadar/ Kunjakanta	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> <li>A well-furnished building with all facilities including electricity and sanitation. It has become easy for official works as well as the management work from the forest area.</li> </ul>	<ul style="list-style-type: none"> <li>The direct field supervision of the Range officer improved. Also promoted better planning, execution and monitoring of plantation activities.</li> </ul>	8	High
51	Range officer's quarter Dhenkanal/ Dhenkanal/ Sadar/ Kunjakanta	<ul style="list-style-type: none"> <li>Two bed rooms, one drawing room, kitchen, toilet, dining hall, electricity, pipe water supply and boundary wall etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>It enabled the Range officer to stay nearer to his own forest area and perform his duty properly.</li> </ul>	8	High
52	Forester office-cum-residence Dhenkanal/ Dhenkanal/ Sadar/ Kunjakanta	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet, electricity and open well for drinking water etc. are available</li> <li>Used as forester office-cum-residence</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building forester is staying here and become easy for him to undertake patrolling as and when required.</li> </ul>	8	High



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53	Staff Barrack Dhenkanal/ Dhenkanal/ Sadar/ Kunjakanta	<ul style="list-style-type: none"> <li>Two storey building</li> <li>Used as mobile barrack</li> <li>Patrolling staffs are staying here.</li> </ul>	<ul style="list-style-type: none"> <li>Enabled patrolling staff to perform their duty perfectly and on time.</li> </ul>	8	High
54	Malkhana Dhenkanal/ Dhenkanal/ Sadar/ Kunjakanta	<ul style="list-style-type: none"> <li>One storey building</li> </ul>	<ul style="list-style-type: none"> <li>Used as a store room for keeping all seized goods.</li> </ul>	6	Medium
55	Range officer's quarter Dhenkanal/ Sadangi/ Sadangi/ Sadangi	<ul style="list-style-type: none"> <li>Two bed rooms, one drawing room, kitchen, toilet, dining hall, electricity, pipe water supply and boundary wall etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>It enabled the Range officer to stay nearer to his own forest area and perform his duty in a better manner.</li> </ul>	8	High
56	Forest Guard Quarter Dhenkanal/ Sadangi/ Sadangi/ Sadar	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet, electricity and water</li> <li>Used as forest guard quarter</li> <li>FG quarter situated in the premises of the range office so that easy to joint forest patrolling</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard felt convenient to stay in the operation area and undertake responsibilities on time.</li> </ul>	8	High
57	Range office Athamalik/ Bamur/ Bamur/ Bamur	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet etc. are available.</li> <li>A well-furnished building with all facilities including electricity and sanitation. It has become easy for official works as well as the management work from the forest area.</li> </ul>	<ul style="list-style-type: none"> <li>The forest work has been managed easily.</li> <li>The direct supervision of the Range officer increased.</li> <li>Information sharing became easy among staff.</li> </ul>	8	High
58	Forester office-cum-residence Athamalik/ Bamur/ Kadalimunda/ Tentalapai	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet, electricity and drinking water etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Patrolling of forest officials improved leading to better supervision and timely undertaking of protection measures.</li> </ul>	8	High





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59	Forest Guard Quarter Athamalik/ Bamur/ Kadalimunda/ Tentalapai	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet, electricity and drinking water etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this intervention the poaching activities became controlled as one forest guard is staying regularly in the quarter.</li> </ul>	8	High
60	Boundary Wall Athamalik/ Bamur/ Kadalimunda/ Tentalapai	<ul style="list-style-type: none"> <li>Well furnishing wall</li> </ul>	<ul style="list-style-type: none"> <li>The construction of boundary improved safety and protection of office premises and building.</li> </ul>	8	High
61	Forest Guard Quarter Athamalik/ Madhapur/ Dekund/ Bharatpur	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet, electricity and drinking water etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Poaching activities were controlled since one forest guard is staying regularly and doing his responsibilities.</li> <li>Ensured the availability of Forest Guard in the site as and when required.</li> </ul>	8	Medium
62	Range office Athamalik/ Madhapur/ Madhapur/ Madhapur	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> <li>A well-furnished building with all facilities including electricity and sanitation. It has become easy for official works as well as the management work from the forest area.</li> </ul>	<ul style="list-style-type: none"> <li>The direct field supervision of the Range officer became easy.</li> </ul>	9	High
63	Nursery watch shed Athamalik/ Madhapur/ Madhapur/ Khandapada	<ul style="list-style-type: none"> <li>Used as watch shed in the nursery under Khandapada beat of Madhapur range.</li> <li>Room with electricity and washroom also available</li> </ul>	<ul style="list-style-type: none"> <li>Used as rest shed for watcher which inturn helped in carrying out of nursery activities.</li> </ul>	8	High



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64	Forester office-cum-residence Athamalik/ Madhapur/ Kiakata/ Kiakata	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet, electricity and open well for drinking water etc.</li> <li>Used by forester for office and residence</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building forester got accomodation and office facilities which helped him to manage patrolling and official work leading to time saving.</li> </ul>	8	High
65	Staff Barrack Athamalik/ Handapa/ Urkela/ Takaba	<ul style="list-style-type: none"> <li>One storey building with all facilities</li> <li>It is constructed in the year 2011-12.</li> <li>Building condition is average.</li> </ul>	<ul style="list-style-type: none"> <li>Accommodation for mobile staff made available and that helped them for better performance of office work.</li> </ul>	6	Medium
66	Forest Guard Quarter Athamalik/ Handapa/ Urkela/ Takaba	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet</li> <li>Used as forest guard quarter</li> <li>A single room with kitchen and toilet is available. No electricity and water supply</li> </ul>	<ul style="list-style-type: none"> <li>The poaching activities has been controlled because of one forest guard has been staying regularly</li> </ul>	7	Medium
67	Range office Athamalik/ Handapa/ Urkela/ Handapa	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> <li>A well furnished building with all facilities including electricity and other sanitation facilities are available. It has become easy for official works as well as the management work from the forest area.</li> </ul>	<ul style="list-style-type: none"> <li>The forest work has been managed easily.</li> <li>The direct supervision of the Range officer made easy.</li> <li>Helped in easy information sharing with staff and it promoted better staff coordination and timely execution of activities.</li> </ul>	8	High
68	Forest Guard Quarter Cuttack/ Sukinda/ Sukinda/ Sukinda	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet, electricity and drinking etc. are available.</li> <li>Forest Guard of Sukinda beat is staying here</li> </ul>	<ul style="list-style-type: none"> <li>Poaching and smuggling activities were minimised because one forest guard has been staying regularly</li> </ul>	8	High





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69	Boundary Wall Cuttack/ Sukinda/ Sukinda/ Nalida	<ul style="list-style-type: none"> <li>Used as protection wall for Forest Guard Quarter.</li> </ul>	<ul style="list-style-type: none"> <li>Increased safety of forest guard quarter.</li> </ul>	8	High
70	Staff Barrack Cuttack/ Sukinda/ Sukinda/ Sukinda	<ul style="list-style-type: none"> <li>Building with Common toilet, rooms, kitchen are available</li> <li>Used by squads and Para staff</li> <li>10 squads are staying in this barrack</li> </ul>	<ul style="list-style-type: none"> <li>Squads are staying there. Thus better patrolling and supervision is ensured.</li> </ul>	8	High
71	Forester office-cum-residence Cuttack/ Sukinda/ Sukinda/ Sukinda	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet, electricity and open well for drinking water etc. are available</li> <li>Used as forester office-cum-residence</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building forester is staying and it has made staff, easy to do patrolling and office work.</li> </ul>	8	High
72	Range office Cuttack/ Sukinda/ Sukinda/ Sukinda	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> <li>It has become easy for official works as well as the management of other work from the forest area.</li> </ul>	<ul style="list-style-type: none"> <li>The direct supervision of the Range officer improved.</li> <li>Information sharing with staff became easy within a short time. Thus better staff co-ordination ensured.</li> </ul>	8	High
73	Forest Guard Quarter Cuttack/ Tomka/ Kansa/ Kansa(B)	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet, electricity and drinking water etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Forest Guard is staying here and doing his work smoothly.</li> </ul>	7	Medium
74	Forester office-cum-residence Cuttack/ Tomka/ Kansa/ Kansa(B)	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet, electricity and open well for drinking water with over head tank etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building forester is staying here and become easy for him to do his patrolling and official works.</li> </ul>	8	High
75	Common Toilet Cuttack/ Tomka/ Tomka/ Duburi	<ul style="list-style-type: none"> <li>Two separate toilets for both male &amp; female. Toilets need to be regularly cleaned.</li> </ul>	<ul style="list-style-type: none"> <li>Used by official staff and office visitors.</li> </ul>	7	Medium



Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
76	Staff Barrack Cuttack/ Tomka/ Tomka/ Tomka	<ul style="list-style-type: none"> <li>Two storey building, garriage, toilet, one hall on the 1st floor, steps, one room on the ground floor, drinking water &amp; electricity etc. are available.</li> <li>11 forest protection staff &amp; para staff and one forester have been staying here for their patrolling and office work.</li> </ul>	<ul style="list-style-type: none"> <li>Helped in undertaking patrolling work on time.</li> </ul>	8	High
77	Range office Cuttack/ Tomka/ Tomka/ Duburi	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> <li>It has become easy for official works as well as the management work from the forest area.</li> </ul>	<ul style="list-style-type: none"> <li>Management and implementation of forest work made easily. The direct supervision of Range officer increased. Information sharing become easy within a short period of time. Thus facilitated quick decision making process.</li> </ul>	8	High
78	Forester office-cum-residence Cuttack/ Dalijoda/ Chandikhol/ Chandikhol	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet, electricity and pipe water etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building forester is staying and it has made staff, easy to do patrolling and office work.</li> </ul>	8	High
79	Staff Barrack Cuttack/ Dalijoda/ Byree/ Byree	<ul style="list-style-type: none"> <li>Two storey building, garage, toilet, one hall on the 1st floor, steps, one room on the ground floor, drinking water &amp; electricity etc. are available.</li> <li>It is constructed in the range office premises</li> </ul>	<ul style="list-style-type: none"> <li>Protection staff &amp; Para staffs are staying here for their patrolling work. Enabled them to undertake their responsibilities on time.</li> </ul>	8	High





Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
80	Range office Cuttack/ Dalijoda/ Byree/ Byree	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Management and implementation of forest work made easily. The direct supervision of Range officer increased. Information sharing become easy within a short period of time. Thus facilitated quick decision making process.</li> </ul>	8	High
81	Forest Guard Quarter Cuttack/ Dalijoda/ Chandikhola/ Nalida	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet, electricity, tube well for drinking water and boundary wall for protection etc. are available.</li> <li>Used as forest guard quarter</li> </ul>	<ul style="list-style-type: none"> <li>It become convenient to monitor the plantation sites with team.</li> </ul>	8	High
82	Range office Athagarh/ Athagarh/ Athagarh/ Athagarh	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Management and implementation of forest work made easily. The direct supervision of Range officer increased. Information sharing become easy within a short period of time. Thus facilitated quick decision making process.</li> </ul>	8	High
83	Forest Guard Quarter Athagarh/ Athagarh Athagarh/ Athagarh	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet, electricity and water</li> <li>Used as forest guard residence</li> <li>This Forest Guard Quarter is situated in the Range office premises.</li> </ul>	<ul style="list-style-type: none"> <li>Forest Guard is staying in this quarter and intervention helped to a great extent in minimizing poaching and smuggling activities.</li> </ul>	8	High



Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
84	Forester office-cum-residence Athagarh/ Athagarh/ Tigiria/ Tigiria	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet, electricity and open well for drinking water etc.</li> <li>Used as forester office-cum-residence</li> <li>One forest guard quarter also constructed in this premises.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building forester is staying here and patrolling made easy for him as and when required.</li> </ul>	8	High
85	Range office Athagarh/ Narsinghpur East/ Narsinghpur/ Narsinghpur	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Facilitated proper management of forest work.</li> <li>The direct supervision of the Range officer in field activities made easy.</li> </ul>	8	High
86	Range officer's quarter Athagarh / Earsinghpur East /Narsinghpur/ Narsinghpur	<ul style="list-style-type: none"> <li>Two bed rooms, one drawing room, kitchen, toilet, dining hall, electricity, pipe water supply and boundary wall etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>It enabled the Range officer to stay nearer to his own forest area and perform his duty in a better manner.</li> </ul>	8	High
87	Forester office-cum-residence Athagarh/ Narsinghpur East/ Devabhuin/ Devabhuin	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet, electricity and open well for drinking water etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building forester is staying here and it helped him to do patrolling work as per the requirement. His field monitoring made easy.</li> </ul>	8	High
88	Forest Guard Quarter Athagarh/ Narsinghpur East/ Devabhuin/ Olab	<ul style="list-style-type: none"> <li>A single room with kitchen and toilet etc. are available.</li> <li>No electricity and drinking water supply</li> </ul>	<ul style="list-style-type: none"> <li>Due to this forest guard is staying here and smoothly carrying out the forest activities.</li> </ul>	6	Medium
89	Staff Barrack Athagarh/ Badamba/ Badamba/ Badamba	<ul style="list-style-type: none"> <li>Two storey building, garage, toilet, one hall on the 1st floor, steps, one room on the ground floor, drinking water &amp; electricity etc. are available.</li> <li>It is constructed in the range office premises</li> </ul>	<ul style="list-style-type: none"> <li>Helped protection staff to stay together near to range office and timely implement the activities.</li> </ul>	8	High

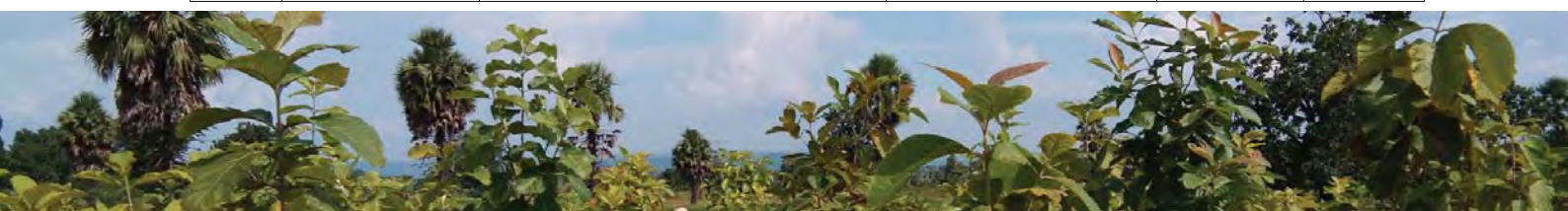




Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
90	Range office Athagarh/ Badamba/ Badamba/ Badamba	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Range office made functional with good working environment.</li> </ul>	8	High

Table 3.22: Usability of Roads, Culvert &amp; Causeway

Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
1	Causeway Satakosia Wild Life/ Pampasara/ Kumuri/ Kumuri-A	<ul style="list-style-type: none"> <li>15 feet width and 50 feet long concrete structure is available</li> <li>Used for all weather forest road</li> <li>Only forest department used this road</li> </ul>	<ul style="list-style-type: none"> <li>Easy access of staff to forest area even in rainy season ensured.</li> </ul>	8	High
2	Forest Road Satakosia Wild Life/ Purunakote/ Baghamunda/ Baghamunda-C	<ul style="list-style-type: none"> <li>9 km Murom road</li> <li>Used by forest department staff and villagers</li> <li>This road is running from Purunakote to Baghamunda.</li> <li>Core area villagers and departmental staffs are used only this road.</li> </ul>	<ul style="list-style-type: none"> <li>Petrolling of forest staff made easy.</li> </ul>	8	High
3	Causeway Satakosia Wild Life/ Purunakote/ Baghamunda/ Baghamunda-C	<ul style="list-style-type: none"> <li>350 sqft concrete structure</li> <li>Used by forest department staff and villagers</li> <li>This causeway situated in the Baghamunda to Purunakote forest road.</li> </ul>	<ul style="list-style-type: none"> <li>Helped forest department staffs for smooth patrolling in rainy season.</li> </ul>	8	High
4	Causeway Mahanadi Wild Life/ Banigochha East/ Dhipasahi/ Dhipasahi	<ul style="list-style-type: none"> <li>19.3 feet width and 20 feet long concrete structure</li> <li>Use for all weather forest road</li> <li>Forest department and people of two villages depended on this road</li> </ul>	<ul style="list-style-type: none"> <li>Causeway protects the road during the rainy season and improved mobility facilities for forest department and people of tow fringe fillages.</li> </ul>	8	High



Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
5	Forest Road Mahanadi Wild Life/ Banigochha East/ Dhipasahi/ Dhipasahi	<ul style="list-style-type: none"> <li>Motorable road with causeway</li> <li>11 feet width Murom filling</li> <li>Road side drainage system should be improved</li> </ul>	<ul style="list-style-type: none"> <li>It helped forest department staff and people of two villages for easy mobility.</li> </ul>	7	Medium
6	Causeway Mahanadi Wild Life/ Chhamundia/ Purunapani/ Purunapani	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>This causeway is using for smoothly communication by this road</li> <li>This causeway constructed as a concrete road.</li> <li>Required drainage system</li> </ul>	<ul style="list-style-type: none"> <li>It helped the people as well as the wild animals to pass easily in the rainy season.</li> </ul>	7	Medium
7	Forest Road Mahanadi Wild Life/ Chhamundia/ Badamula/ Malisahi	<ul style="list-style-type: none"> <li>Motorable road with Murom filling</li> <li>12 feet width and 10 km long murom filling road. This road is running from Basaganda to Duisary village. Near about 1000 people from 7 villages i.e. Seketapali, Usamuska, Dhipisahi, Geregedi, Dumduma, Duisinga, Bankajhari are dependent on this road.</li> <li>Road side drainage system should be improved</li> </ul>	<ul style="list-style-type: none"> <li>Communication facilities improved for forest department and people of 7 villages.</li> </ul>	7	Medium
8	Causeway Mahanadi Wild Life/ Kusanga/ Sitalapani/ Marada	<ul style="list-style-type: none"> <li>12 feet width and 70 feet long concrete structure</li> <li>Use for all weather forest road</li> <li>Forest department and people of two villages namely Kuturi and Morada were dependant on this causeway and road. The causeway situated on the Morada to Sitalpani forest road. Due to this causeway stream water is running throughout the year.</li> </ul>	<ul style="list-style-type: none"> <li>Causeway protects the road and helped smooth motorable in all seasons.</li> </ul>	8	High
9	Forest Road Mahanadi Wild Life/ Kusanga/ Kusanga/ Nuapada	<ul style="list-style-type: none"> <li>12 feet width road with 300 ft concrete road</li> <li>Used as forest road</li> <li>12 feet width and 300 ft long concrete road. Near about 2000 people from 5 villages i.e. Talasahi, Garged, Purunasahi, Bankajhari and Kusanga are dependent on this road.</li> </ul>	<ul style="list-style-type: none"> <li>Communication facilities for forest department and people of five villages promoted their mobility become easy.</li> </ul>	8	High





Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
10	Forest Road Dhenkanal/ Hindol/ Hindol/ Hindol	<ul style="list-style-type: none"> <li>Murom filling road</li> <li>Used by forest department staff at the time of their patrolling.</li> </ul>	<ul style="list-style-type: none"> <li>Patrolling of forest department staff made easy.</li> </ul>	6	Medium
11	Culvert Dhenkanal/ Hindol/ Hindol/ Hindol	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Used as culvert on the forest road</li> <li>Situated in Tini Khandia Nala</li> </ul>	<ul style="list-style-type: none"> <li>Improved communication facilities ensured even in rainy season for department staff and forest frieng village people.</li> </ul>	7	High
12	Forest Road Dhenkanal/ Sadangi/ Sadangi/ Kosipur	<ul style="list-style-type: none"> <li>Motorable road</li> <li>Used by forest department staff</li> </ul>	<ul style="list-style-type: none"> <li>People of 10 villages and forest staff used this road. It promoted easy mobility of all concerned.</li> </ul>	6	Medium
13	Culvert Athamalik/ Bamur/ Bamur/ Bamur	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Used as culvert on the forest road</li> </ul>	<ul style="list-style-type: none"> <li>Due to this culvert forest department having easy mobility in all seasons and also culvert protects the road from damage in rainy season.</li> </ul>	8	High
14	Causeway Athamalik/ Bamur/ Sargipali/ Gada Ghumra	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Used by forest department staff</li> </ul>	<ul style="list-style-type: none"> <li>Helped easy mobility in all seasons and also the culvert protects the road during rainy season.</li> </ul>	8	High
15	Forest Road Athamalik/ Madhapur/ Madhapur/ Bilipur	<ul style="list-style-type: none"> <li>Motorable road with causeway</li> <li>Used by forest department staff</li> </ul>	<ul style="list-style-type: none"> <li>Used as all weather roa</li> </ul>	6	Medium
16	Culvert Athamalik/ Madhapur/ Madhapur/ Bilipur	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Used as culvert on the forest road</li> </ul>	<ul style="list-style-type: none"> <li>Used as all weather road. Hence better communication facilities ensured.</li> </ul>	8	High



Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
17	Causeway Athamalik/ Madhapur/ Madhapur/ Bilipur	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Used as causeway</li> <li>Forest road cross the Ramp Water</li> </ul>	<ul style="list-style-type: none"> <li>Due to this culvert forest department having easy mobility in all seasons and also culvert protects the road during the rainy season due to heavy flow of rain water.</li> </ul>	6	Medium
18	Culvert Athamalik/ Handapa/ Urkela/ Takaba	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Used as culvert on the forest road</li> <li>Used as all weather road</li> </ul>	<ul style="list-style-type: none"> <li>Due to this culvert forest department has having easy mobility access in all seasons and also the culvert protects the road during rainy season.</li> </ul>	8	High
19	Forest Road Athamalik/ Handapa/ Urkela/ Takaba	<ul style="list-style-type: none"> <li>Moterable road with causeway</li> <li>Used by forest department staff</li> </ul>	<ul style="list-style-type: none"> <li>Used as all weather road.</li> <li>Thus improvement in communication facilities.</li> </ul>	8	High
20	Causeway Athamalik/ Handapa/ Urkela/ Takaba	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Used as causeway in the forest road</li> </ul>	<ul style="list-style-type: none"> <li>Due to this culvert forest department having easy mobility in all seasons.</li> </ul>	8	High
21	Forest Road Cuttack/ Sukinda/ Sukinda/ Patapur	<ul style="list-style-type: none"> <li>Motorable road with causeway</li> <li>used by forest department</li> </ul>	<ul style="list-style-type: none"> <li>Increased communication facilities for villagers of 4 to 5 villages ensured.</li> </ul>	8	High
22	Causeway Cuttack/ Sukinda/ Sukinda/ Patapur	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Smooth movement on forest road</li> <li>Well condition. On Kabat-Kakudei Forest Road</li> </ul>	<ul style="list-style-type: none"> <li>Due to this culvert forest department having easy mobility in all seasons and also culvert protects the road in the rainy season</li> <li>4 villages also use this cause way for easy communication.</li> </ul>	7	High





Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
23	Culvert Cuttack/ Sukinda/ Sukinda/ Patapur	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Used as culvert on the forest road</li> <li>Used by 4 villages</li> </ul>	<ul style="list-style-type: none"> <li>Due to this culvert forest department doing their mobility in all seasons and also culvert protects the road during the rainy season.</li> <li>Improvement in communication facilities for 4 villages ensured.</li> </ul>	8	High
24	Forest Road Cuttack/ Tomka/ Kansa/ Kansa	<ul style="list-style-type: none"> <li>Moterable road with causeway</li> <li>Used by forest department staff and community people</li> <li>This road connects Kansa &amp; Rankia. Frequently used and hence further maintenance is required</li> </ul>	<ul style="list-style-type: none"> <li>Communication and transportation facilities for 2 villages developed.</li> </ul>	6	Medium
25	Causeway Athagarh/ Narsinghpur East/ Devabhuin/ Devabhuin	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Use for water drainage</li> <li>This causeway situated at Puruna Pani Nalla in the Seramunda-GuptaPani Forest Road (24.5 km)</li> </ul>	<ul style="list-style-type: none"> <li>This causeway facilitated forest department staff mobility in all seasons better.</li> </ul>	8	High
26	Forest Road Athagarh/ Badamba/ Badamba/ Badamba Sadar	<ul style="list-style-type: none"> <li>Motorable road with causeway</li> <li>Road is used by Forest Department</li> <li>Maintenance is required</li> </ul>	<ul style="list-style-type: none"> <li>Used as all weather road.</li> <li>Thus improved communication facilities ensured</li> </ul>	8	High
27	Causeway Athagarh/ Badamba Badamba/ Badamba Sadar	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Helps in movement during heavy rain</li> </ul>	<ul style="list-style-type: none"> <li>Due to this culvert forest department having easy mobility in all seasons and also culvert protects the road in the rainy season</li> </ul>	8	High
28	Culvert Athagarh/ Badamba/ Badamba/ Aranda	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms with stone packing (2m)</li> <li>This culvert is situated at Kasikhala Nalla</li> <li>It helps to drainage heavy rain water, control flash flood and protect forest road.</li> </ul>	<ul style="list-style-type: none"> <li>Used as all weather road</li> </ul>	8	High



Table 3.23: Water Body and other water management structure

Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
1	Water body Satakosia Wild Life/ Tikarpada/ Tikarpada/ Tikarpada	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>Water available throughout the year</li> <li>Fruit bearing plants are planted on the bank of the water body. Water body maintained as per norms.</li> </ul>	<ul style="list-style-type: none"> <li>Available drinking water for wild animal throughout the year</li> </ul>	9	High
2	Water body Satakosia Wild Life/ Pampasara/ Pampasar/ Pampasar-B	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>Water available throughout of the year</li> <li>Slops and fruit bearing tree are available (Panasa, Pujuli &amp; Kaitha) on the bank of the water body. And also Barking deer, elephant, sambar and wild bores are coming this water body.</li> </ul>	<ul style="list-style-type: none"> <li>Wild animals used this water round the year</li> </ul>	9	High
3	Water body Satakosia Wild Life/ Purunakote/ Baghamunda/ Baghamunda	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>5ft water available in this water body</li> <li>Fruit bearing trees are planted on bank of the water body.</li> </ul>	<ul style="list-style-type: none"> <li>Availability of water for the wild animals round the year.</li> </ul>	8	High
4	Water body Mahanadi Wild Life/ Banigochha East/ Badasilinga/ Badasilinga	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>Water available up to the month of December.</li> <li>Nearby local cattle has also used the water body.</li> </ul>	<ul style="list-style-type: none"> <li>Water requirement of wild animals for drinking and bathing purposes is met for 7-8 months.</li> </ul>	6	Medium
5	Water body Mahanadi Wild Life/ Chhamundia/ Dhipasahi/ Dhipasahi	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>Water available up to the month of March.</li> <li>Water available up to month of March.</li> <li>No fruit bearing tree on the bank of the water body. Bankajhari and Duisinga villagers also used this water body.</li> </ul>	<ul style="list-style-type: none"> <li>Met the water requirement of wild animals for drinking and bathing purposes.</li> </ul>	5	Medium





Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
6	Water body Mahanadi Wild Life/ Kusanga/ Kusanga/ Nuapada	<ul style="list-style-type: none"> <li>The water body condition is dry</li> <li>No water available at the time of observation</li> <li>In this water body water available only for six months</li> <li>In-late facility should available</li> </ul>	<ul style="list-style-type: none"> <li>The wild animals use water only for six months. To certain extent less water availability for wild animals.</li> </ul>	5	Medium
7	Water body Angul/ Bantala/ Kanja/ Kanja	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>This water body has been constructed near the forest area enabling the wild animals to drink water. Wild animals like Elephant, Wild boar, Sambar and Barking deer are coming to this water body.</li> <li>Different type of fruit bearing tree also planted on the bank of the water body. But from March to May no water available in this water body.</li> </ul>	<ul style="list-style-type: none"> <li>Water for drinking and bathing purpose of wild animals available for 7 months.</li> </ul>	6	Medium
8	Water body Angul/ Chhendipada/ Chhendipada/ Kampasada	<ul style="list-style-type: none"> <li>Available water throughout the year</li> <li>Wild animals like Elephant, Wild boar, Beer, Rabbit and Barking deer are coming to this water body for drinking and bathing purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Availability of Water for wild animals and fringe village people round the year.</li> </ul>	8	High
9	Water Body Angul/ Kaniha/ Kaniha/ Sapkota	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>Weed spread bank of the water body, ramp is damaged</li> </ul>	<ul style="list-style-type: none"> <li>Availability of Water for wild animals and fringe village people round the year.</li> </ul>	6	Medium
10	Water Body Dhenkanal/ Hindol/ Dandari/ Kanka -A	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>Water is available throughout the year</li> </ul>	<ul style="list-style-type: none"> <li>Availability of water for drinking and bathing purpose of wild animals.</li> </ul>	8	High
11	Water Body Dhenkanal/ Sadangi/ Khankira/ Chotatentuli	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>Water is available throughout the year</li> <li>Mainly elephants are used this water body for their bathing and drinking purposes</li> </ul>	<ul style="list-style-type: none"> <li>Availability of water for drinking and bathing purpose of wild animals round the year.</li> </ul>	8	High



Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
12	Water body Athamalik/ Bamur/ Sargipali/ Gada Ghumra	<ul style="list-style-type: none"> <li>Water is available throughout the year</li> <li>Wild animals are using this water body for drinking and bathing purposes</li> </ul>	<ul style="list-style-type: none"> <li>The intervention made water availability for drinking and bathing purpose of wild animals throughout the year.</li> </ul>	8	High
13	Water body Athamalik/ Madhapur/ Dekund/ Bharatpur	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>Water is available throughout the year</li> </ul>	<ul style="list-style-type: none"> <li>The intervention made water availability for drinking and bathing purpose of wild animals throughout the year.</li> </ul>	8	High
14	Water body Athamalik/ Handapa/ Urkela/ Takaba	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>Weed spread bank of the water body, ramp is damaged</li> </ul>	<ul style="list-style-type: none"> <li>The intervention made water availability for drinking and bathing purpose of wild animals throughout the year.</li> </ul>	6	Medium
15	Water Body Cuttack/ Sukinda/ Sukinda/ Patapur	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> </ul>	<ul style="list-style-type: none"> <li>Availability of water for drinking and bathing purpose of wild animals round the year.</li> </ul>	8	High
16	Water Body Cuttack/ Tomka/ Kansa/ Kansa	<ul style="list-style-type: none"> <li>Used by wild animal and community people</li> <li>Outlet and bank slope is available</li> <li>Water is available throughout year</li> </ul>	<ul style="list-style-type: none"> <li>Met the water requirement of wild animals for drinking and bathing purposes.</li> </ul>	8	High
17	Water body Cuttack/ Dalijoda/ Byree/ Byree	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>Throughout the year water is available</li> <li>During the time of evaluation 10 ft deep water available in this water body.</li> <li>Animals foot mark is observed near the bank</li> </ul>	<ul style="list-style-type: none"> <li>Met the water requirement of wild animals for drinking and bathing purposes.</li> </ul>	9	High





Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
18	Water Body Athagarh/ Athagarh/ Tigiria/ Tigiria	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> </ul>	<ul style="list-style-type: none"> <li>Met the water requirement of wild animals for drinking and bathing purposes.</li> </ul>	7	Medium
19	Water Body Athagarh/ Narsinghpur East/ Devabhuin/ Jadapada	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>Water is available throughout year</li> <li>Site selection is very well</li> </ul>	<ul style="list-style-type: none"> <li>Met the water requirement of wild animals for drinking and bathing purposes.</li> </ul>	8	High
20	Water Body Athagarh/ Badamba/ Badamba/ Khalimati	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> <li>No fruit bearing plants around water body, one Jamun &amp; one Neem tree is present, Slope or Ramp is present for easy access of animals</li> </ul>	<ul style="list-style-type: none"> <li>Met the water requirement of wild animals for drinking and bathing purposes.</li> </ul>	8	High
21	Check Dam Satakosia Wild Life/ Purunakote/ Tuluka North/ Tuluka - C	<ul style="list-style-type: none"> <li>Check dam made by a concrete wall</li> <li>8 feet water available in this check dam</li> </ul>	<ul style="list-style-type: none"> <li>The construction of check dam tended increase in recharge of ground water in adjacent villages.</li> </ul>	8	High
22	Tube well Mahanadi Wild Life/ Kusanga/ Kusanga/ Kumuri	<ul style="list-style-type: none"> <li>Used for drinking water purposes</li> <li>Water available throughout the year</li> <li>Good functioning</li> </ul>	<ul style="list-style-type: none"> <li>Availability of safe drinking water.</li> </ul>	8	High
23	Tube well Angul/ Bantala/ Kanja/ Kanja	<ul style="list-style-type: none"> <li>No water available at the time of digging. 100 ft pipe is not sufficient for this tube well.</li> <li>Need for repairing</li> </ul>	<ul style="list-style-type: none"> <li>Defunct</li> </ul>	3	Low
24	Tube well Athamalik/ Bamur/ Kadalimunda/ Tentalapai	<ul style="list-style-type: none"> <li>Used for drinking water purposes</li> <li>Water available throughout the year</li> <li>Good use for drinking water</li> </ul>	<ul style="list-style-type: none"> <li>Availability of safe drinking water.</li> </ul>	8	High
25	Tube well Athamalik/ Madhapur/ Kiakata/ Kiakata	<ul style="list-style-type: none"> <li>Used for drinking water purposes</li> <li>Water available throughout the year</li> </ul>	<ul style="list-style-type: none"> <li>Availability of safe drinking water round the year.</li> </ul>	8	High



Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
26	Tube well Cuttack/ Dalijoda/ Chandikhola/ Nalida	<ul style="list-style-type: none"> <li>Used for drinking water purposes</li> <li>Water available throughout the year</li> </ul>	<ul style="list-style-type: none"> <li>Ensured water supply to Guard Quarter</li> </ul>	8	High

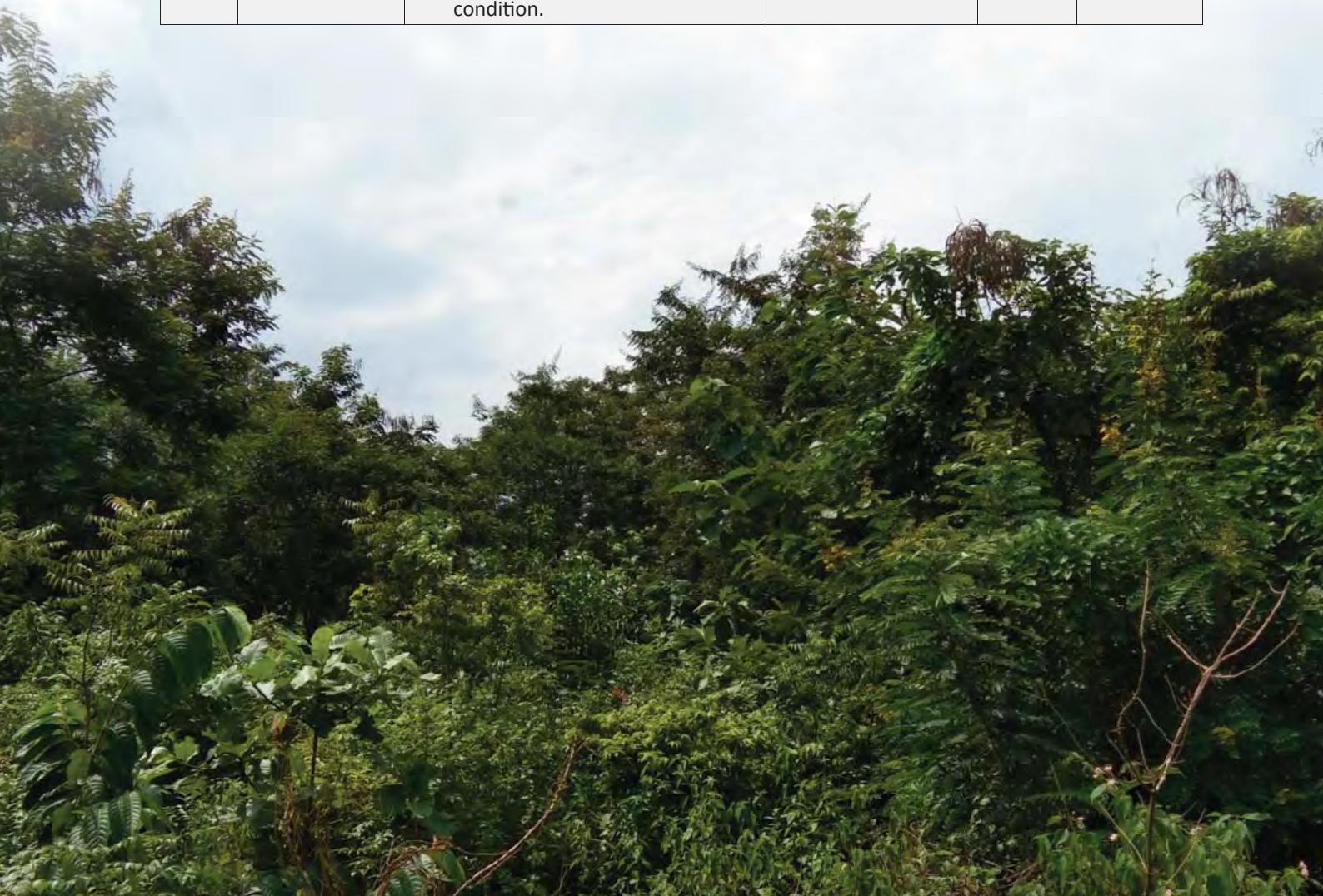
Table 3.24: Usability of seizer yard and other wild life management

Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
1	Earthen Graded Bond Mahanadi Wild Life/ Chhamundia/ Purunapani/ Purunapani	<ul style="list-style-type: none"> <li>2 km earthen bond with stone packing and LBCD</li> <li>Controls the rain water and increases the soil measure composition</li> <li>During field visit the constructed Earthen Graded Bond was observed in good condition.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this activity the flash floods minimised.</li> <li>Further it protected the forest road from rain water caused damage.</li> <li>Soil moisture composition increased.</li> <li>It tended recharging of ground water, which again is visible in terms of increased green cover in the location.</li> </ul>	8	High
2	Surface Dyke Mahanadi Wild Life/ Kusanga/ Sitalapani/ Sitalpani	<ul style="list-style-type: none"> <li>It is a Concrete structure of 506 cft.</li> <li>Used as water slippage breaker</li> </ul>	<ul style="list-style-type: none"> <li>The surface dyke increased the moisture component of upstream soil leading to increase in the green forest cover in this area.</li> </ul>	8	High





Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
3	Elephant Trench Mahanadi Wild Life/ Chhamundia/ Badamula/ Badamula	<ul style="list-style-type: none"> <li>Constructed a trench for protecting camp shed</li> <li>Well and good condition trench with wooden bridge</li> </ul>	<ul style="list-style-type: none"> <li>Improved the safety of camp shed from elephant threat.</li> </ul>	8	High
4	Saltlick Satakosia Wild Life/ Tikarpada/ Tikarpada/ Tikarpada	<ul style="list-style-type: none"> <li>Used by wild animal</li> <li>Salt should be use periodically</li> </ul>	<ul style="list-style-type: none"> <li>The intervention helped in meeting the mireral requirements of the wild animals.</li> </ul>	6	Medium
5	VHF Tower Satakosia Wild Life/ Pampasara/ Kumuri/ Kumuri-B	<ul style="list-style-type: none"> <li>VHF Tower, Battery, Control unit, Waitaki are available</li> <li>VHF tower used for better communication on the remote area</li> <li>This VHF tower situated near the Kumuri beat.</li> <li>100 ft high VHF tower is very good condition.</li> </ul>	<ul style="list-style-type: none"> <li>Improved better communication among staff.</li> </ul>	8	High



Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
6	Saltlick Satakosia Wild Life/ Purunakote/ Tuluka/ Tuluka - A	<ul style="list-style-type: none"> <li>All facilities are available as a saltlick</li> <li>This is used by wild animal</li> <li>100 sq. ft space used for this saltlick. As per the foot mark observed that, Wild boar, Barking deer and Deer are coming into this saltlick.</li> </ul>	<ul style="list-style-type: none"> <li>Helped in meeting mineral requirements of wild animals.</li> </ul>	6	Medium
7	Meadow Development Mahanadi Wild Life/ Banigochha East/ Badasilinga/ Badasilinga	<ul style="list-style-type: none"> <li>This meadow field was fully destroyed.</li> <li>It needs to be maintained periodically and properly.</li> </ul>	<ul style="list-style-type: none"> <li>To an extent lack of proper maintenance leading to less of fodder availabilities for wild animals.</li> </ul>	2	Low
8	Meadow Development Mahanadi Wild Life/ Chhamundia/ Purunapani/ Purunapani	<ul style="list-style-type: none"> <li>Dry field</li> <li>Different type of regeneration trees also available</li> <li>Early maintenance should be done</li> </ul>	<ul style="list-style-type: none"> <li>To an extent lack of proper maintenance leading to less of fodder availabilities for wild animals.</li> </ul>	1	Low
9	VHF Tower Mahanadi Wild Life/ Chhamundia/ Purunapani/ Purunapani	<ul style="list-style-type: none"> <li>VHF Tower, Battery, Control unit, Wakitaki</li> <li>VHF used for remote area communication</li> <li>This VHF set is function now</li> </ul>	<ul style="list-style-type: none"> <li>Improved communication among staff promoted better implementation of CAMPA activities.</li> </ul>	8	High
10	Saltlick Mahanadi Wild Life/ Chhamundia/ Dhipasahi/ Gargedi	<ul style="list-style-type: none"> <li>All facilities are available as a saltlick for used by wild animal</li> <li>Used by wild animal</li> <li>400 sq. ft space used for this saltlick. As per the foot mark observed that, Wild boar, Barking deer, Sambar, Bison and Elephants are coming for saltlick.</li> <li>Salt should be use periodically</li> </ul>	<ul style="list-style-type: none"> <li>Cattered to the mineral requirement of wild animals.</li> </ul>	5	Medium





Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
11	Meadow Development/ Mahanadi Wild Life/ Kusanga/ Sripaju/ Padmatola	<ul style="list-style-type: none"> <li>Less quantity of green grass available along with ware fencing.</li> <li>Less quantity of green grass available along with ware fencing. A natural water body is available in the meadow field.</li> <li>Grass should be planted as per the soil condition and required periodically maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Availability of fodder/grass for wild animals.</li> </ul>	4	Medium
12	Saltlick Mahanadi Wild Life/ Kusanga/ Kusanga/ Nuapada	<ul style="list-style-type: none"> <li>All facilities are available for used by wild animal</li> <li>Edible soil by wild animal</li> <li>It is well constructed near a water body inside the RF for the wild animals to get salt while licking.</li> <li>Salt should be used periodically</li> </ul>	<ul style="list-style-type: none"> <li>Cattered to the mineral requirements of wild animals.</li> </ul>	5	Medium
13	Solar Fencing Mahanadi Wild Life/ Kusanga/ Sripaju/ Padmatola	<ul style="list-style-type: none"> <li>Ware fencing with all systems</li> <li>Used as a wire fencing</li> <li>Five lines ware fencing is available with 5 feet height and 1 km long.</li> <li>Some places ware fencing damaged by elephant</li> <li>Battery should be replaced</li> </ul>	<ul style="list-style-type: none"> <li>Restricted free access of domestic cattle to the forest area.</li> </ul>	6	Medium
14	VHF Tower Angul/ Bantala/ Kanja/ Kanja	<ul style="list-style-type: none"> <li>VHF Tower, Battery, Control unit, Wakitaki</li> <li>VHF used for communication from each other in the remote area</li> <li>This VHF set is functioning properly</li> </ul>	<ul style="list-style-type: none"> <li>Facilitated better communication among staff helped in developing effective strategy for patrolling.</li> </ul>	8	High
15	VHF Tower Athamalik/ Bamur/ Kadalimunda/ Tentalapai	<ul style="list-style-type: none"> <li>VHF tower is not functioning properly</li> <li>It is under repairing condition</li> </ul>	<ul style="list-style-type: none"> <li>Defunct</li> </ul>	3	Low
16	VHF Tower Athamalik/ Handapa/ Urkela/ Takaba	<ul style="list-style-type: none"> <li>Forest staffs communicated with each in the remote area though this VHF tower</li> </ul>	<ul style="list-style-type: none"> <li>Staffs are communicated properly through VHF tower ensured proper patrolling.</li> </ul>	8	High



Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
17	VHF Tower Cuttack/ Tomka/ Tomka/ Tomka	<ul style="list-style-type: none"> <li>Communicate section offices basically</li> <li>Forest staffs communicated with each in the remote area though this VHF tower</li> <li>This is functioning around 2 km radios</li> </ul>	<ul style="list-style-type: none"> <li>Facilitated instant communication to range office as well as field office.</li> </ul>	6	Medium
18	Seizure Yard Cuttack/ Tomka/ Tomka/ Duburi	<ul style="list-style-type: none"> <li>Used as Seizure Yard</li> <li>All seized wood log, vehicles and other items were stored within the yard.</li> </ul>	<ul style="list-style-type: none"> <li>Helped to store the seized item safely.</li> </ul>	8	High
19	Seizure Yard Athagarh/ Narsinghpur East/ Narsinghpur/ Narsinghpur	<ul style="list-style-type: none"> <li>Used as Seizure Yard</li> <li>All seized wood log, vehicles and other items were stored within the yard.</li> </ul>	<ul style="list-style-type: none"> <li>Construction of the Seizure yard helped to keep the seized item under proper watch.</li> </ul>	8	High
20	Check Gate Satakosia Wild Life/ Purunakote/ Purunakote/ Chhotkei	<ul style="list-style-type: none"> <li>Used as check gate</li> <li>This is the entrance of the core forest area</li> </ul>	<ul style="list-style-type: none"> <li>It minimized the smuggling and poaching cases activities.</li> </ul>	9	High
21	Watch Tower Satakosia Wild Life/ Pampasara/ Kumuri/ Kumuri-B	<ul style="list-style-type: none"> <li>Building with electrification, water facility and toilet</li> <li>Used as watch tower for observation of forest area</li> </ul>	<ul style="list-style-type: none"> <li>Identification of fire incident and position of the wild animal made easy.</li> </ul>	9	High
22	Watch Tower Mahanadi Wild Life/ Chhamundia/ Badamula/ Malisahi	<ul style="list-style-type: none"> <li>Observed that, this building doesn't look like a watch tower. It looks like a pandal.</li> </ul>	<ul style="list-style-type: none"> <li>Community people used as a pandal at the time of local festival</li> </ul>	4	Medium
23	Watch Tower Mahanadi Wild Life/ Kusanga/ Sripaju/ Padmatola	<ul style="list-style-type: none"> <li>Building with electrification, water facility and toilet</li> <li>Used as rest shed for anti-poaching and fire control staff</li> <li>Watch tower situated near the water body.</li> <li>Required water for drinking purposes</li> </ul>	<ul style="list-style-type: none"> <li>Watch Tower helped to identify the fire incident and position of the wild animal</li> </ul>	8	High





Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
24	Watch Tower Dhenkanal/ Hindol/ Dandari/ Kanka -A	<ul style="list-style-type: none"> <li>Four storeys building with electricity, washroom, overhead water tank facilities.</li> <li>Used as watch tower for observation of forest area</li> </ul>	<ul style="list-style-type: none"> <li>It facilitated identification of fire incidents and position of the wild animals.</li> </ul>	8	High
25	Watch Tower Dhenkanal/ Sadangi/ Khankira/ Mundamani	<ul style="list-style-type: none"> <li>Building with Electricity and water facilities.</li> <li>Used as watch tower for observation of forest area</li> <li>It is used for protection of Kapilash Sanctuary, elephant tracking and poacher detection</li> <li>Required drinking water facility</li> </ul>	<ul style="list-style-type: none"> <li>Identification of fire incidents and movement of wild animals made easy.</li> </ul>	8	High
26	Watch Tower Cuttack/ Sukinda/ Sukinda/ Pimpudih	<ul style="list-style-type: none"> <li>Building with electrification, water facility and toilet</li> <li>Used as watch tower for observation of forest area</li> <li>Most of the time used by night patrolling staff</li> </ul>	<ul style="list-style-type: none"> <li>Identification of fire incidents and movement of wild animals made easy.</li> </ul>	8	High
27	Watch Tower Cuttack/ Dalijoda/ Chandikhol/ Lalitgiri	<ul style="list-style-type: none"> <li>Building (3 rooms) with electrification, water with overhead tank and toilet facilities</li> <li>Used as watch tower for observation of forest area</li> <li>Required more staff for patrolling</li> </ul>	<ul style="list-style-type: none"> <li>Made easy to undertake forest protection work like fire control, illegal smuggling etc.</li> </ul>	7	Medium
28	Watch Tower Athagarh/ Narsinghpur East/ Devabhuin/ Jadapada	<ul style="list-style-type: none"> <li>Water supply and solar light facility available</li> <li>Used as watch tower cum rest shed</li> <li>Most of the time used by night patrolling staff</li> </ul>	<ul style="list-style-type: none"> <li>Watching / patrolling of forest protection works like fire incidents and illegal smuggling etc. become easy.</li> <li>Besides it helped to identify the fire incidents and position of the wild animal.</li> </ul>	9	High



Table 3.25: Usability of Nursery

Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
1	Permanent Nursery Athamalik/ Bamur/ Kadalimunda/ Tentalapai	<ul style="list-style-type: none"> <li>Available of water supply with overhead tank (Bore well and water body), RT Nursery (two lakh twenty seedling), electricity, shed net with stand etc.</li> <li>Some activities have been made in this nursery from CAMPA funds like - Boundary wall, Store house, godown shed, Compost godown, Vermin compost, Road, Seedling yard and overhead tank etc.</li> <li>Observed some seedlings are available in this nursery i.e.: Sal, Neem, Asana, Mahula, Kumbhi, Jamu, Kusuma, Rohini, Sunari, Bahada, Tentuli, Lodha, Amla, Mahalimba, Khaira, Jautha, Sisui, Subabul, Sirisha &amp; Radha Chuda etc.</li> </ul>	<ul style="list-style-type: none"> <li>Promoted easy availability of quality seedling at the plantation sites.</li> </ul>	9	High
2	Central Nursery Athagarh/ Athagarh/ Rajanagar/ Rajanagar	<ul style="list-style-type: none"> <li>Boundary wall, Site Development, office building, vermin compost, Labour rest shed, Seed drying space, Store room, Nursery pit etc. are constructed from the CAMPA fund.</li> <li>Distributed 10000 seedlings and &amp; 1 lakh seedling stock at the time of our observation. Species Teak, Gambhari, Amla, Neem, Karanja, Fasi, Harida, Kaitha, Jamun, Baula, Mehogani, Guava etc. are available in this nursery.</li> </ul>	<ul style="list-style-type: none"> <li>The requirements of seedlings at divisional level for plantation met/ catered.</li> </ul>	8	High





Table 3.26: Usability of Sacred Groves

Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
1	Sacred Groves Angul/ Chhendipada/ Chhendipada/ Kampasada	<ul style="list-style-type: none"> <li>This is a worship place for local community</li> <li>Plantation, Tube well, Fencing, and development of Debastali site has been done by CAMPA fund.</li> <li>To an extent the plantations did not have better growth performance due to poor soil condition.</li> </ul>	<ul style="list-style-type: none"> <li>Soil &amp; moisture conservation improved and developed.</li> <li>Positive attitude among people developed for planting more trees.</li> </ul>	8	High
2	Sacred Groves Athamalik/ Madhapur/ Dekund/ Raniakota	<ul style="list-style-type: none"> <li>Used by villagers as a worship place namely Maa Maheswari Sakti Pitha</li> <li>Signboard and plantation site available</li> </ul>	<ul style="list-style-type: none"> <li>60 households of near by village awared absent the benefits of forest and raising plantations.</li> </ul>	8	High
3	Sacred Groves Athamalik/ Handapa/ Urkela/ Takaba	<ul style="list-style-type: none"> <li>Plantation site with tube well constructed by CAMPA fund in the year APO year 2012-13</li> </ul>	<ul style="list-style-type: none"> <li>Positive attitude among people developed for planting more trees.</li> </ul>	8	High



Table 3.27: Zoo Management (Deer Park)

Sl. No.	Type of Assets/ Division / Range/ Section/ Beat	Type of current use/ Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
1	Deer Park Mahanadi Wild Life/ Banigochha East/ Takeru/ Takeru	<ul style="list-style-type: none"> <li>Some activities have been done from CAMPA fund i.e. Boundary wall, wire fencing for deer, feeding crawl, water top, ticket counter, visitor sitting bench, foot path, animal partition wall, playing ramp etc.</li> <li>258 spotted deer are staying here.</li> <li>Everyday 10 workers are engaged in this park for doing different type of work.</li> </ul>	<ul style="list-style-type: none"> <li>No of visitors (Nearby 10,000/pm) to deer park increased for site seen and recreation.</li> </ul>	8	High

### 3.17 Summary of Findings

- In the Block plantation the plant survival rate varies from 90.4 percent (Athamallik FD) to 77.8 percent (Mahanadi WL). So, plant mortality rate varies between 9.6 percent (Athamallik FD) to 22.3 percent (Mahanadi WL).
- In the Bald Hill plantation, the survival rate of the plants under these categories found to be lowest in Cuttack FD (88.4 percent) and highest in Angul FD (95.0 percent).
- In ANR with gap plantation Plant survival rate per ha. varies between 92.5 percent (Dhenkanal and Athamallik) to 85.6 percent (Satakosia WL).
- In Avenue Plantation Plant mortality rate observed to be 9.3 percent in Athamallik and 9.6 percent in Cuttack.
- In Bamboo Plantation, plant mortality rate calculated to be 7.9 percent.
- Canopy cover in bamboo plantation is observed high among all the plantation categories (85.0 percent), followed by block plantation (49.0 percent) and ANR with gap plantation (42.0 percent). Among all the plantations, canopy covered observed low in case of avenue plantation (40.0 percent).
- Different SMC works observed implemented in plantation sites with emphasis on staggered trench and LBCD structures. Percolation pits have also been taken up in some sites.

### 3.18 Suggestions

- Indigenous species should be planted instead of exotic species.
- Maintenance and watch and ward activities may continue for 6 to 8 years for better plant growth performance of sustainability of forest.
- Species should be selected on the basis of soil condition of the plantation site.



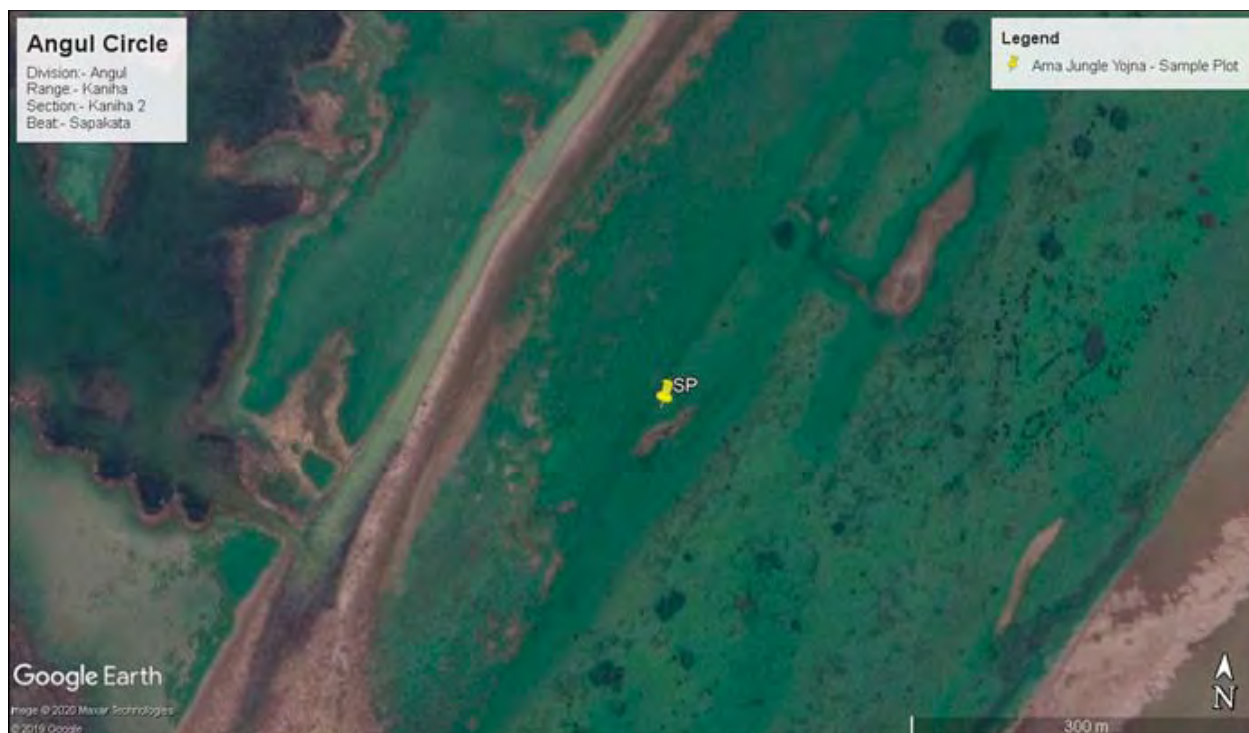


- Fencing is required for the plantation site which is nearer to the habitation.
- After damage of installed sign boards and pillars, there should be reinstallation of the same for proper demarcation and identification of plantation site.
- Number of watchers should be increased in proportion to the size of the plantation site. It is ideal to place one watcher for each 50 hectares of plantation.
- There should be periodic capacity improvement programmes for the members of JFMCs under Ama Jangala Yojana.
- Need of training of Forest Staff on proper documentation of Plantation journal, record keeping and reporting to some extent is felt.
- The mandays allotted for SSO Bamboo work is not sufficient, so mandays may be increased.
- More focus may be given to Silviculture Operation work other than plantation owing to better growth of trees due to silvicultural operations.
- It is observed as well as reported by the forest officials that in the case of buildings construction particularly for staff quarters, in the existing designs, there is no staircase for which it becomes difficult to clean the roof. As a result the durability of the building may be affected. Necessary modification may be made in the design.
- In the case of buildings constructed during initial years of CAMPAs needs to be repaired and maintained.
- Meadow development works should be a component in CAMPAs APOs in each year. Reason being, if it is done in a particular year and discontinued subsequently, there is dearth of fodder for wild animals.
- Considering the increase in the cost of living, the salary hike of para , anti-poaching staff , elephant trackers, forest squads etc receiving salary from the service providers under CAMPAs, may be considered.
- There should be battery replacement and maintenance in solar fencing system. In many instances it is observed that once battery is damaged, there is no further provision of maintenance of solar fencing system. It is suggested that there should provision in CAMPAs APOs for the periodic maintenance of solar fencing system.





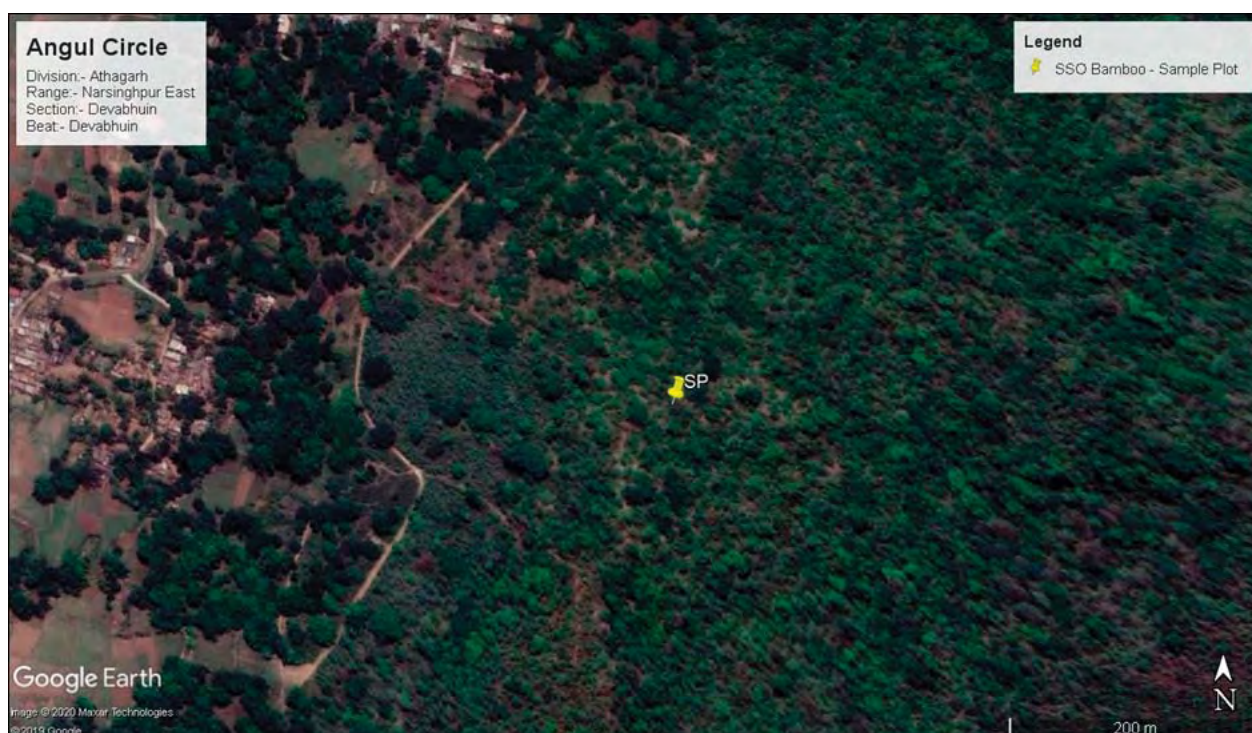
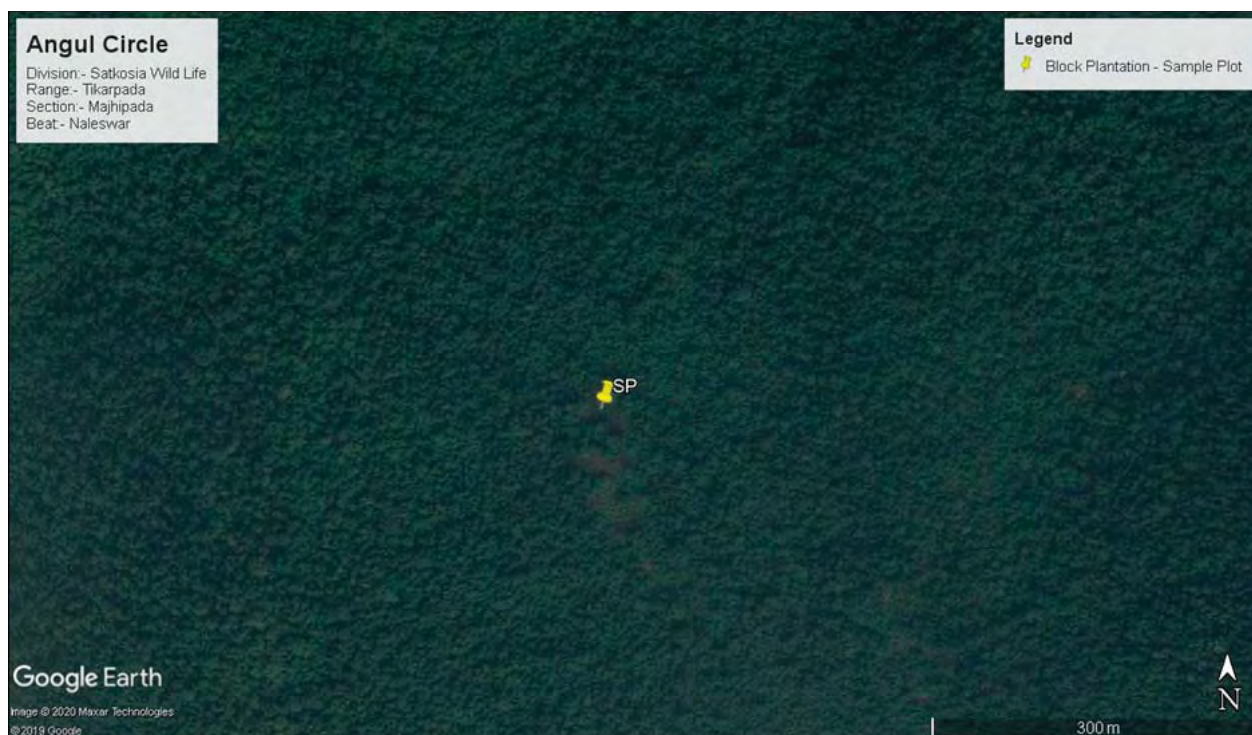
### 3.19 Satellite Imagery of sample plots in Angul Circle





















## CHAPTER - IV







## 4. Evidence of CAMPA Intervention in Baripada Circle:

### 4.1 Introduction:

Baripada forest circle is spread over three districts, namely Balasore, Mayurbhanj and Keonjhar. The Mayurbhanj and Keonjhar districts of the forest circle is known for its vegetation and bio-diversity. About 34.18 percent (7,698.89 sq. km.) of the total geographical area (22,527 sq. km.) of the three districts is covered under forest<sup>19</sup> (forest of different classifications). The districts witness a positive change in the forest cover area, in comparison to 2017 assessment. Very Dense Forest (VDF) is about 21.39 percent (1,646.73 sq. km.) of the total forest area and 7.31 percent of the total geographical area of the districts. Moderately Dense Forest (MDF) (3,270.69 sq. km.) is 42.48 percent of the total forest area and 14.52 percent of the total geographical area of the districts in combination. Open forest is lower than the moderately dense forest in the districts (combine), i.e., 36.13 percent (2,781.47 sq. km.) of the total forest area and 12.35 percent of the total geographical area. Baripada forest circle is having five divisions, i.e., (1) Balasore, (2) Baripada, (3) Karanjia, (4) Keonjhar WL and (5) Rairangpur.

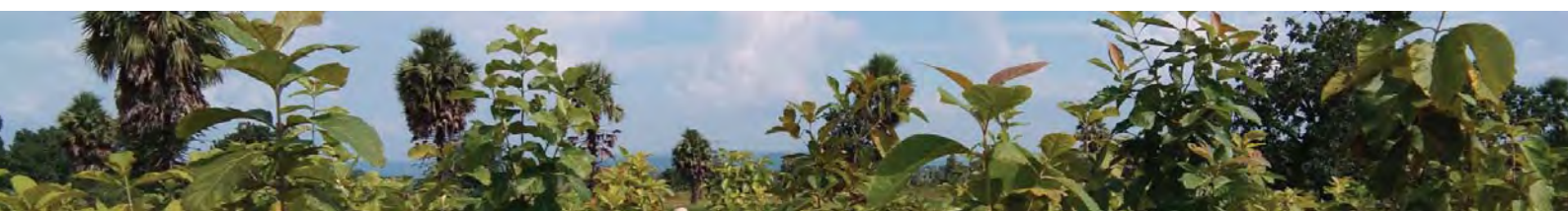
*Table 4.1: Forest Area in Different Districts of the Circle*

District	Geographical Area (GA) (in Sq. Km.)	2019 Assessment (in Sq. Km.)				% of GA	Change w.r.t 2017 Assessment
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total		
Balasore	3,806	23	133.38	226.18	382.56	10.05	2.56
Keonjhar	8,303	288.78	1,420.07	1,513.31	3,222.16	38.81	10.16
Mayurbhanj	10,418	1,334.95	1,717.24	1,041.98	4,094.17	39.30	14.17
Grand Total	22,527	1,646.73	3,270.69	2,781.47	7,698.89	34.18	

Source: ISFR, 2019

The district of Balasore is having geographical area of 3,806 sq. km. of which 23 sq. km (0.60 percent of GA) is under very dense forest category, 133.38 sq. km. (3.50 percent of GA) is moderately dense forest and 226.18 sq. km (5.94 percent of GA) is open forest. Total forest area in the district is 10.05 percent of the total geographical area. There is a positive change in forest cover in the district, by 2.56 sq. km. in comparison to 2017 assessment. The total geographical area of Keonjhar district is 8,303 sq. km. of which 288.78 sq. km. (3.48 percent) is under very dense forest, 1420.07 sq. km (17.10 percent of the GA) is moderately dense forest and 1,513.31 sq. km (18.23 percent of GA) is open forest. Total forest area in the district is 3,222.16 sq. km. Total forest area to the geographical area of the district is 38.81 percent which shows a decreasing trend by 10.16 sq. km. as compared to 2017 assessment. Similarly, Mayurbhanj is having forest area of 39.30 percent of the total geographical area of the district, comprising 1,334.95 sq. km. of very dense forest (12.81 percent of the GA), 1,717.24 sq. km (16.48 percent of GA) of moderately dense forest and 1,041.98 sq. km (10.0 percent of the GA) of open forest. The district reflects a positive change in forest area coverage, i.e., 14.17 sq. km. in comparison to 2017 assessment.

<sup>19</sup> ISFR, 2019



## 4.2 Plantation Activities:

Key plantation activities that have been taken up in the circle are block plantation, ANR with enrichment planting, bald hill plantation and avenue plantation. Block plantation was taken up in 2009-10, covering a total area of 2,445.43 ha. ANR with gap plantation covered a total area of 3,900 ha. in 2014-15 and 7,400 ha. in 2015-16. In bald hill plantation, 90 ha. covered in the year 2015-16 in Baripada and Keonjhar WL forest divisions.



Figure 4.1: Plantation Activities  
Source: Forest & Environment Dept.

## 4.3 CRM and Silvicultural Operation:

Under CRM and silvicultural operations, activities taken up are like SSO-Timber, ANR without Gap plantation and management of old Teak plants. Apart from these, silvicultural operations / maintenance works were taken up for the area covered under plantation in different years, along with replacement for dead plants. ANR without gap plantation covered a total area of 5,229 ha. in 2009-10, 3,292.65 ha. in 2010-11 and 5,272.92 ha. in 2013-12. Silvicultural operations in timber was taken up in 2013-14 in 4,520 ha. and in 1,747 ha. in 2014-15. Coverage of area under CRM and silvicultural operation under different categories are presented in the figure.



Figure 4.2: CRM & Silvicultural Operations  
Source: Forest & Environment Dept.

## 4.4 Study Coverage:

The study covered all the six forest divisions of the circle under different components of CAMPA. The forest divisions covered are (1) Balasore, (2) Baripada, (3) Karanjia, (4) Keonjhar WL





(5) Rairangpur and (6) Similipal Tiger Reserve. Under the forest divisions, 18 ranges were covered under the study. Details are presented below. Under plantation and silvicultural operation component, the study covered 93 plots from 37 sites in 5 forest divisions, 15 forest ranges, 29 forest sections and 32 forest beats of the circle to understand CAMPA interventions.

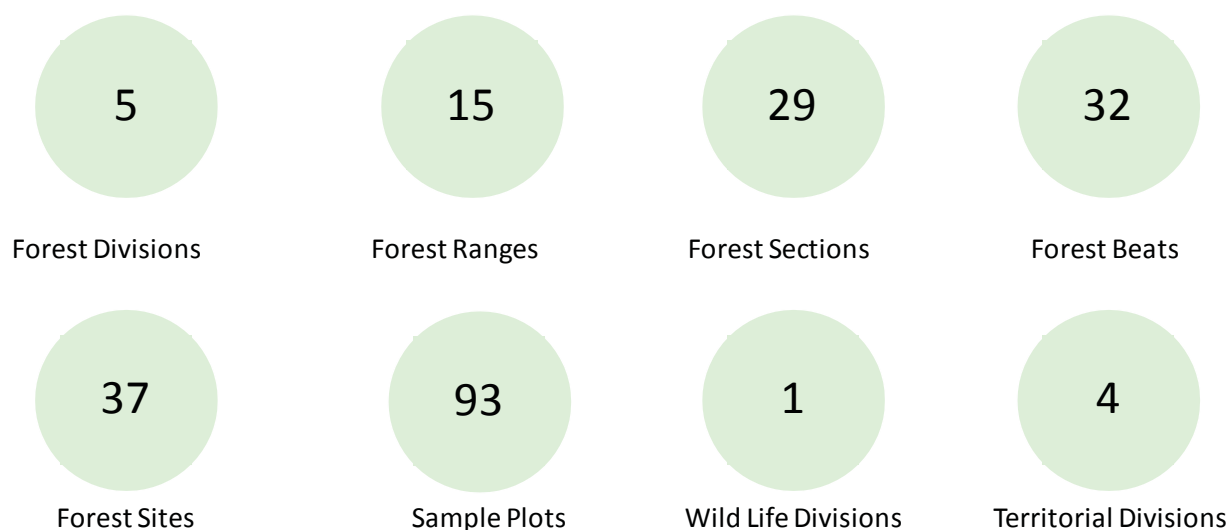


Figure 4:3: Assessment Coverage

#### 4.5 Site Coverage:

The study covered 37 sites in six forest divisions, covering both plantation, silvicultural operations and different infrastructural facilities / assets created under CAMPA. Of the total site coverage, 88.9 percent are plantation sites and 11.1 percent are sites with silvicultural operations. The infrastructural facilities and services (created assets) along with SMC works were assessed across all the sites in each forest division.

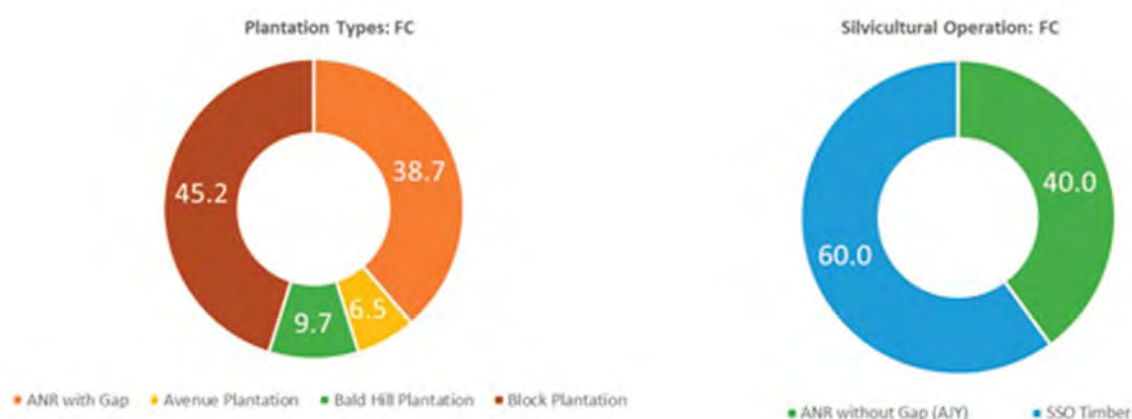
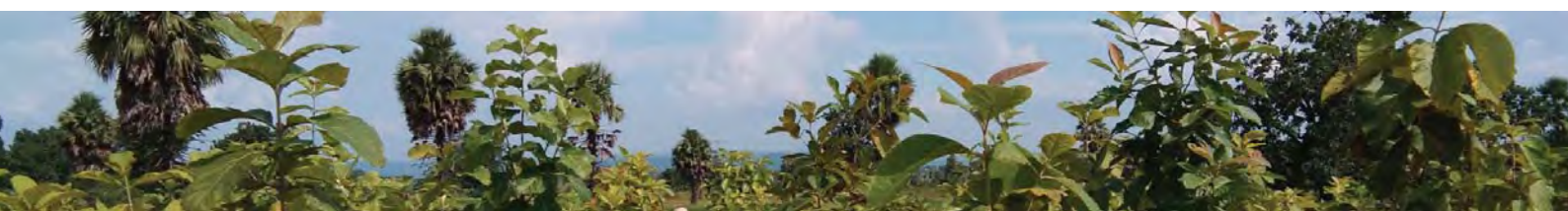


Figure 4:4: Site Distribution by Plantation / Silviculture



The plantation sites cover (1) ANR with gap plantation (38.7 percent), (2) bald hill plantation (9.7 percent), (3) avenue plantation (6.5 percent) and (4) block plantation sites (45.2 percent). In silvicultural operation, the study covered (1) ANR without gap plantation (40.0 percent) and (2) SSO-timber (60.0 percent). Circle and Division level distribution of sites are presented in the figures.

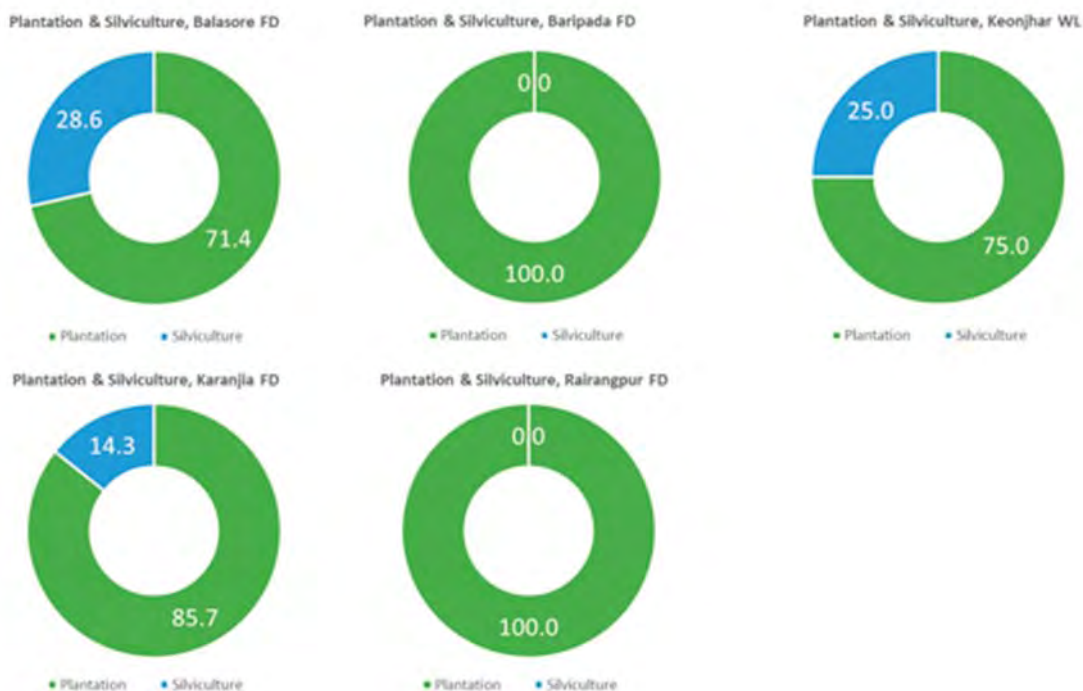


Figure 4:5: Plantation & Silvicultural Operation Distribution by Forest Division

#### 4.6 Area of the Site:

Plantation in the circle covers a total area of 13835 ha. since 2009-10, i.e., on an average 1729.4 ha. per year, irrespective of type of plantation. Plantation by categories reflects that the circle has highest area of plantation under ANR Gap Plantation category, followed by Block Plantation and Bald Hill Plantation. Similarly, under silvicultural operation, the area coverage remains to be 20462.09 ha., irrespective of operational typology.

Plantation activities and silvicultural operations have been taken up since 2009-10. Major plantation activities have been in the year 2009-10, 2014-15 and 2015-16. Plantation activities seem comparatively less in the years 2011-12, 2012-13 and 2016-17. Though silvicultural operations in different sites were in force, specific investments made for silvicultural operations under CAMPA from 2010-11 to 2015-16. Year wise distribution of sites by plantation and silvicultural operation is presented in the figure.





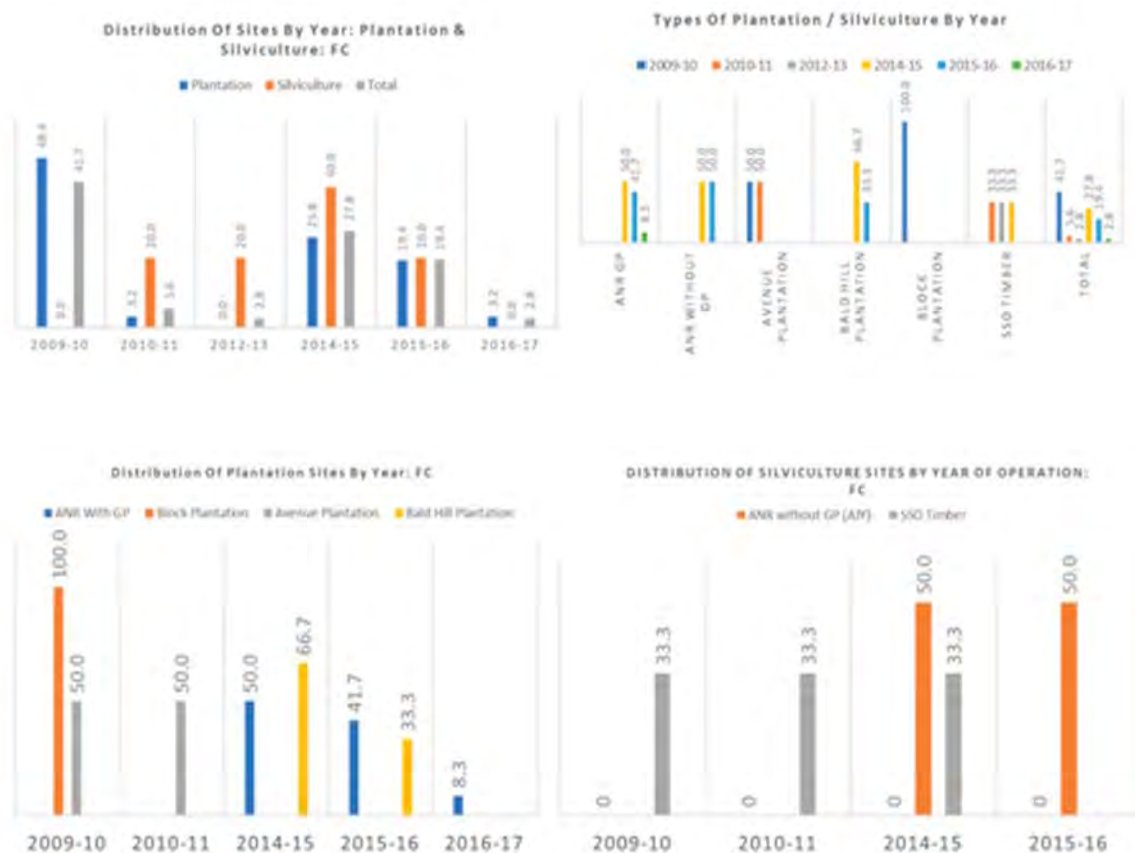


Figure 4:6: Distribution of Studied Sites by Year of Plantation

The average plantation area of the studied sites observed to be 55.0 ha. with total plantation area of 8,783 ha. Of the total plantation area, 92.79 percent are ANR with gap plantation, followed by block plantation (6.38 percent). Avenue plantation and bald hill plantation has been less, i.e., 0.26 percent and 0.57 percent respectively.

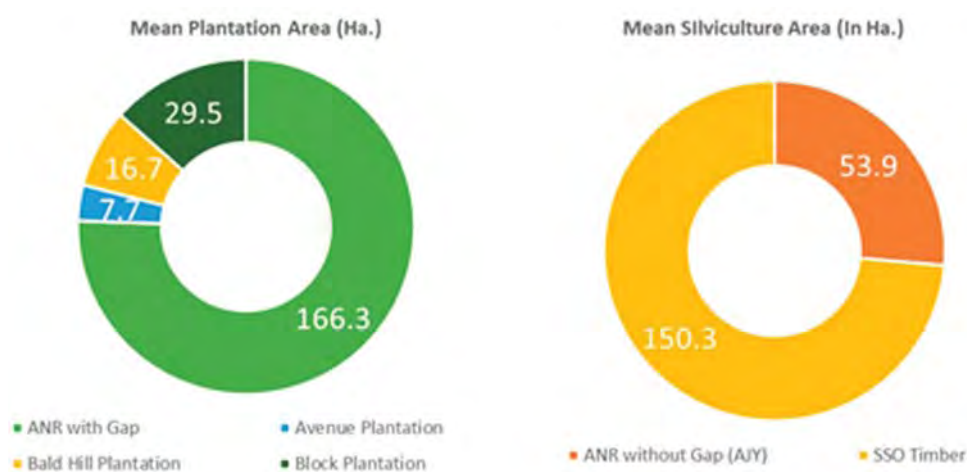


Figure 4:7: Mean Area (ha.) under Plantation and Silviculture by Type



Average area under silvicultural operation, irrespective of its type, is 102.1 ha. with total area of 2,223.5 ha. In the silvicultural operation, emphasis has been given to SSO timber (87.9 percent of the total area) followed by ANR without enrichment plantation (12.1 percent of the total area). Average area under plantation and silvicultural operations by forest division is presented in the figure.

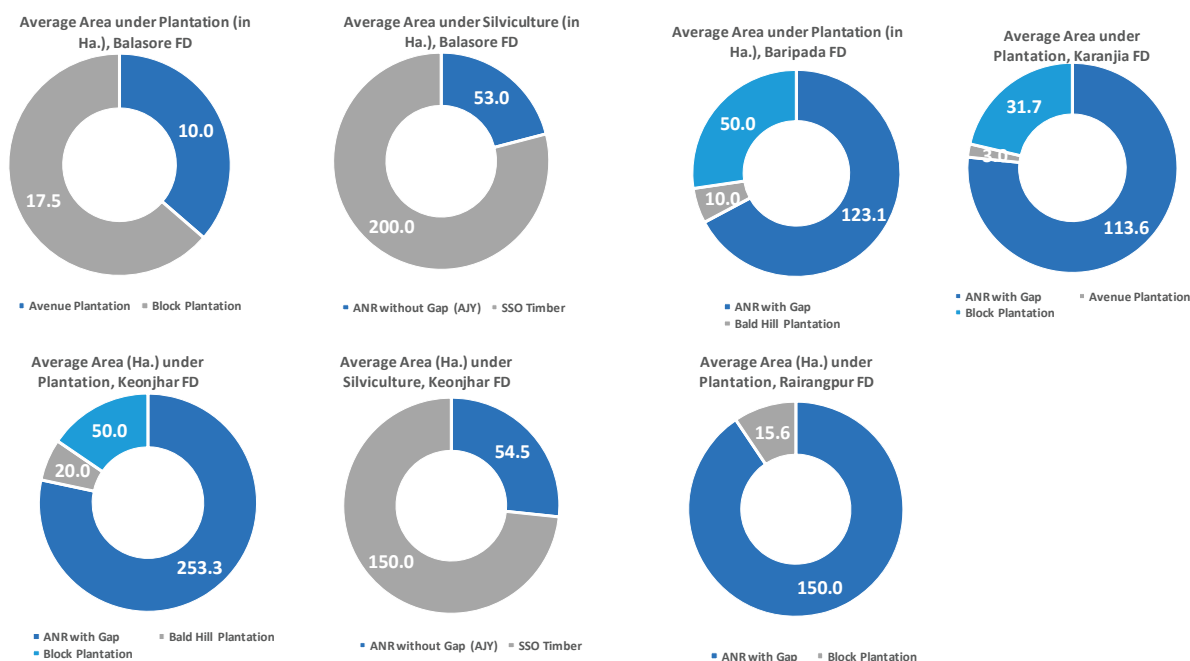


Figure 4:8: Ranking of Plantation and Silvicultural Operations by Site

Ranking of the plantation sites, based on its area (ha.) reveals that 48.4 percent plantation area, irrespective of plantation category, are <=25 ha. Of the total, 19.4 percent plantation area are in the category of >25 and <=50 ha. In the higher area categories, number of sites are less, i.e., 12.9 percent sites in >75 and <=100 category, 3.2 percent sites are in >100 and <=125 category and same percentage of sites (3.2 percent) are in >150 & <=175 and >200 area category. So, plantation activities have been taken up in the circle covering areas of different size where higher focus is to cover small patches of land that are below 50 ha. Similarly, silvicultural operations also have focus on small patches as well as bigger size of the area. In silvicultural





operation, sites normally fall under >25 and ≤50 ha. (60.0 percent sites), >125 and ≤150 ha. (20.0 percent sites) and >175 & ≤200 ha. (20.0 percent sites). There is no silvicultural operation in areas that are ≤25 ha., however, significant plantation activities have been taken up in patches of these categories. Ranking of plantation sites by area (ha.) for the forest circle and divisions are presented in diagrams.

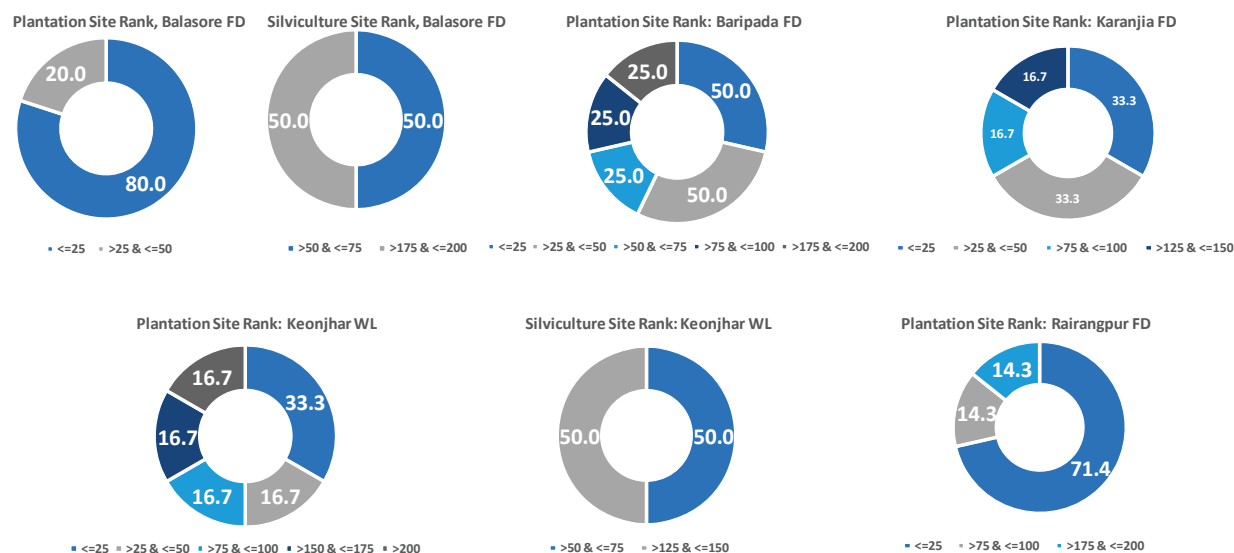


Figure 4:9: Ranking of Plantation & Silvicultural Operation Sites by Forest Division

#### 4.7 Plant Survival Rate:

Plant survival rate varies by plantation categories and also by forest divisions. Overall, survival rate is calculated to be 91.0 percent. Highest plant survival rate is reported in Karanjia forest division (96.3 percent) followed by Keonjhar WL (94.0 percent) and lowest in Balasore forest division (80.6 percent). Plant survival rate by plantation categories are discussed below.

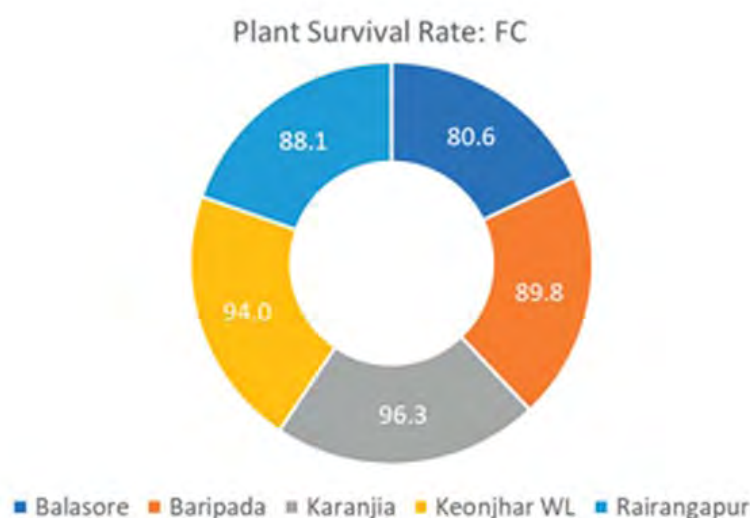
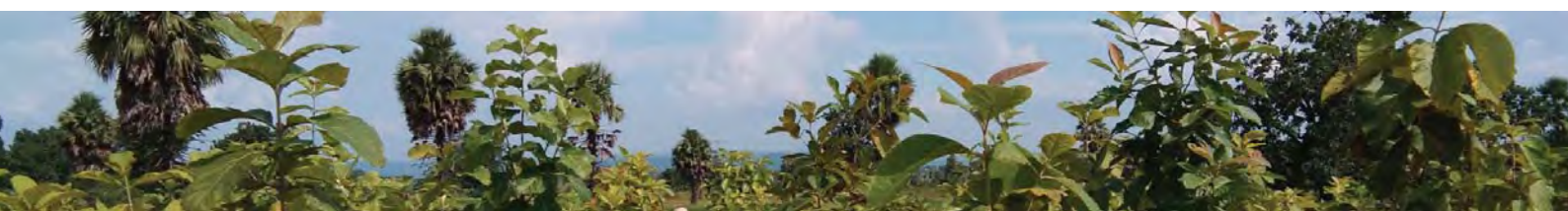


Figure 4:10: Overall Plant Survival and Mortality



#### 4.7.1 Block Plantation:

Average number of plants per ha., varies considerably across sites, plots, by type of plantation and also by forest divisions. In block plantation, average no. of plants per ha. enumerated to be 1,537 with highest average number of plants in Keonjhar WL (1595) and lowest in Baripada forest division (1485). The plant survival rate varies from 99.5 percent (Keonjhar WL) to 92.75 percent (Baripada).

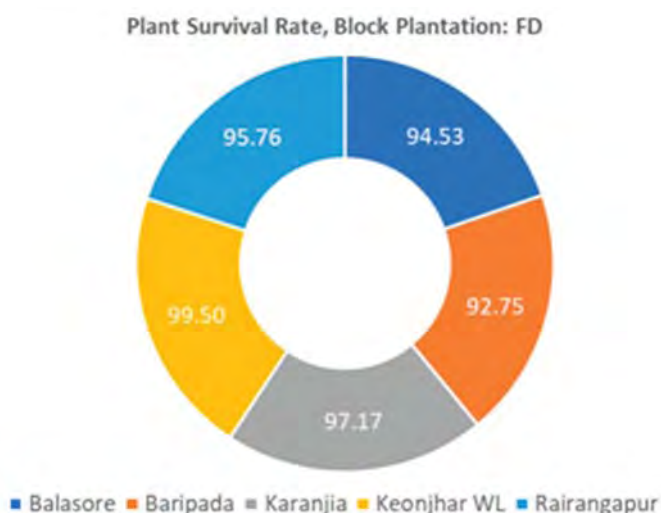


Figure 4:11: Plant Survival Rate in Block Plantations

#### 4.7.2 Bald Hill Plantation:

Bald hill plantation observed in two forest divisions, i.e., Baripada FD and Keonjhar WL. In bald hill plantation, average no. of plants per ha. enumerated to be 1,578 with highest average number of plants in Keonjhar WL (1,585) and lowest in Baripada (1,570). The survival rate of the plants under these categories found to be lowest in Baripada (98.13 percent) and highest in Keonjhar WL (99.06 percent).

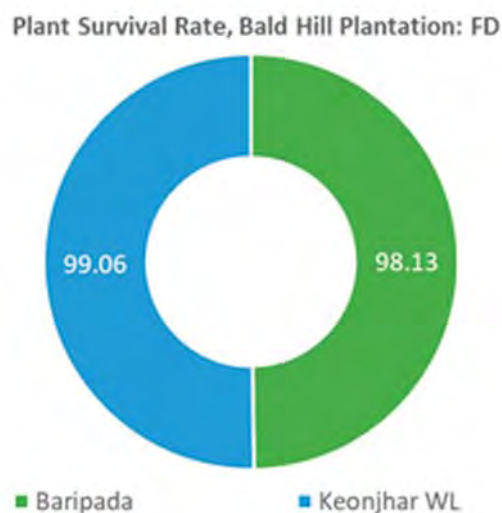


Figure 4:12: Plant Survival Rate in Bald Hill Plantation

#### 4.7.3 ANR with Gap Plantation:

ANR with gap plantation (enrichment planting) is taken in a dual mode, i.e., dense plantation in block mode in identified patch of land and/or sparse / scattered plantation in the forest area. Plot specific plant count varies across plots and by forest division. As plantation mode has been of different nature, total plants planted and plants standing on the ground were taken in to account to estimate survival and mortality rate per ha. Average number of plants per ha. enumerated to be 181 with highest number of plants per ha. in Karanjia (194) and lowest in Rairangpur (169). Plant survival rate per ha. varies between 84.7 percent (Rairangpur) to 96.9 percent (Karanjia).

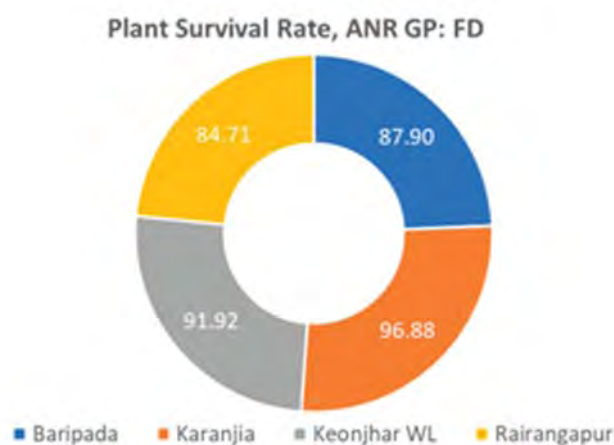


Figure 4:13: Plant Survival Rate under ANR with Gap Plantation





#### 4.7.4 Avenue Plantation:

Avenue plantation is taken up in two forest divisions of the circle, i.e., in Balasore and Karanjia. Average number of plants per r.km. enumerated to be 221. Plant survival rate observed to be 93.0 percent in Balasore and 84.0 percent in Karanjia.

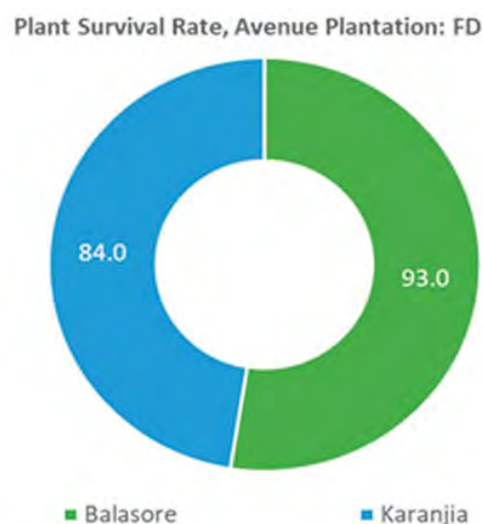


Figure 4.14: Plant Survival Rate under Avenue Plantation

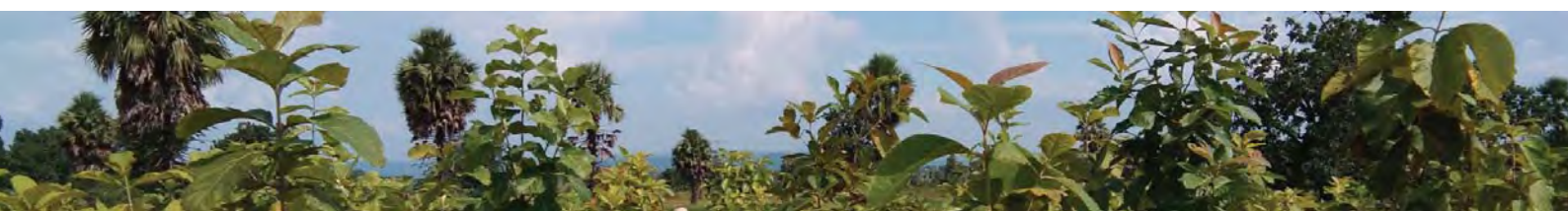
Ranking of sites by plant survival rate reveals that at the circle level about 35.1 percent are in >95.0 % survival category, 14.9% are in the >93 % & ≤95 % category followed by 16.2 % in >90 % to ≤93 % category. Aggregating different survival rate categories, it can be concluded that 95.9 percent sites have plant survival rate within 80.0 percent and 91.9 percent sites have plant survival rate within 85.0 percent. Circle and division wise ranking of plantation sites based on plant survival rate is presented in the table 4.2.

Table 4.2: Plant Survival Rate Ranking by Plantation Categories

Plantation Types	Plant Mortality Rank (% Distribution)								
	>95 %	>93≤ 95 %	>90≤ 93 %	>88≤ 90 %	>85≤ 88 %	>80≤ 85 %	>75≤ 80 %	>70≤ 75 %	≤70 %
ANR with GP	26.5	12.2	18.4	20.4	10.2	2.0	6.1	4.1	0.0
Avenue Plantation	0.0	33.3	33.3	0.0	0.0	33.3	0.0	0.0	0.0
Bald Hill Plantation	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Block Plantation	52.6	21.1	10.5	5.3	5.3	0.0	0.0	0.0	5.3
<b>Total</b>	<b>35.1</b>	<b>14.9</b>	<b>16.2</b>	<b>14.9</b>	<b>8.1</b>	<b>2.7</b>	<b>4.1</b>	<b>2.7</b>	<b>1.4</b>

Table 4.3: Plant Survival Rate by Plantation Categories & Forest Divisions

Forest Divisions	>95 %	>93≤ 95 %	>90≤ 93 %	>88≤ 90 %	>85≤ 88 %	>80≤ 85 %	>75≤ 80 %	>70≤ 75 %	≤70 %
Balasore									
Avenue Plantation		50.0	50.0						
Block Plantation	20.0	40.0	20.0						20.0
Total	14.3	42.9	28.6						14.3
Baripada									
ANR with Gap	7.7	7.7	30.8	30.8	7.7	0.0	7.7	7.7	
Bald Hill Plantation	100.0								



Forest Divisions	>95 %	>93<= 95 %	>90<= 93 %	>88<= 90 %	>85<= 88 %	>80<= 85 %	>75<= 80 %	>70<= 75 %	<=70 %
Block Plantation	25.0	25.0	25.0		25.0				
Total	16.7	11.1	27.8	22.2	11.1		5.6	5.6	
Karanjia									
ANR with Gap	72.7	18.2	9.1						
Avenue Plantation						100.0			
Block Plantation	100.0								
Total	73.3	13.3	6.7			6.7			
Keonjhar WL									
ANR with Gap	26.7	20.0	26.7	20.0	6.7				
Bald Hill Plantation	100.0								
Block Plantation	100.0								
Total	42.1	15.8	21.1	15.8	5.3				
Rairangapur									
ANR with Gap			0.0	30.0	30.0	10.0	20.0	10.0	
Block Plantation	60.0	20.0		20.0					
Total	20.0	6.7	0.0	26.7	20.0	6.7	13.3	6.7	

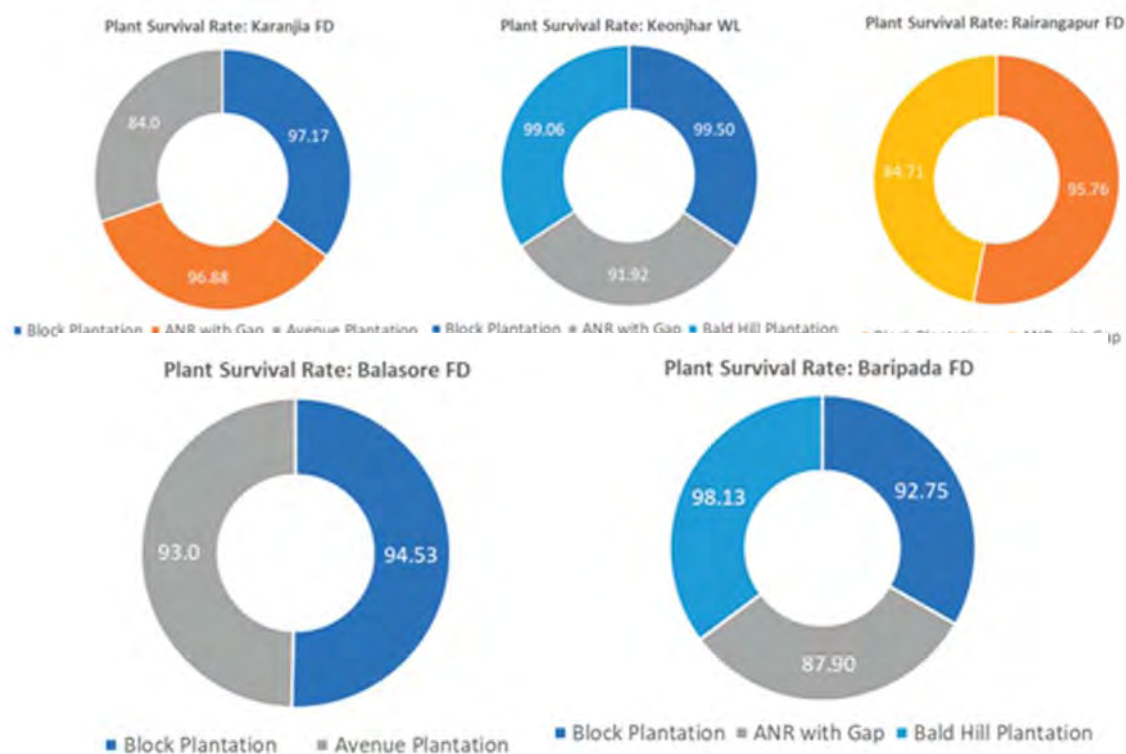


Figure 4:15: Plant Survival Rate by Plantation Type and Forest Division Wise





## 4.8 Canopy Cover:

Canopy cover normally depends upon the age of the plant, species and crown density of the plants. It is observed in the assessment that the canopy cover varies by plantation types and year of plantation. As year of plantation varies along with plant species, canopy cover varies by site and by forest divisions.

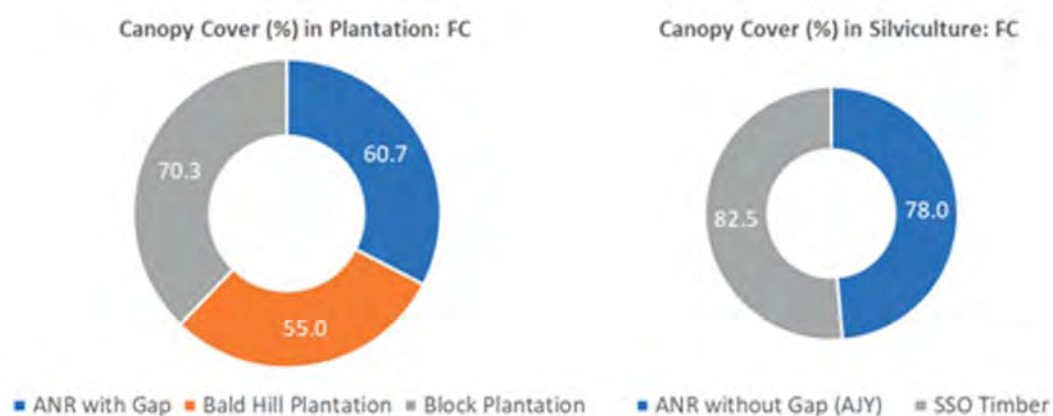


Figure 4:16: Canopy Cover in Forest Circle

Canopy cover in block plantation is observed high among all the plantation categories (70.3 percent), followed by ANR with gap plantation (60.7 percent) and bald hill plantation (55.0 percent). Sites covered under silvicultural operations in many sites have better canopy cover in comparison to plantation sites. Average canopy cover observed to be highest in case of SSO timber (82.5 percent) followed by ANR without enrichment plantation (78.0 percent). Canopy cover of plantation sites (by plantation category) and sites covered under silvicultural operational is presented below by forest division in figures and tables.





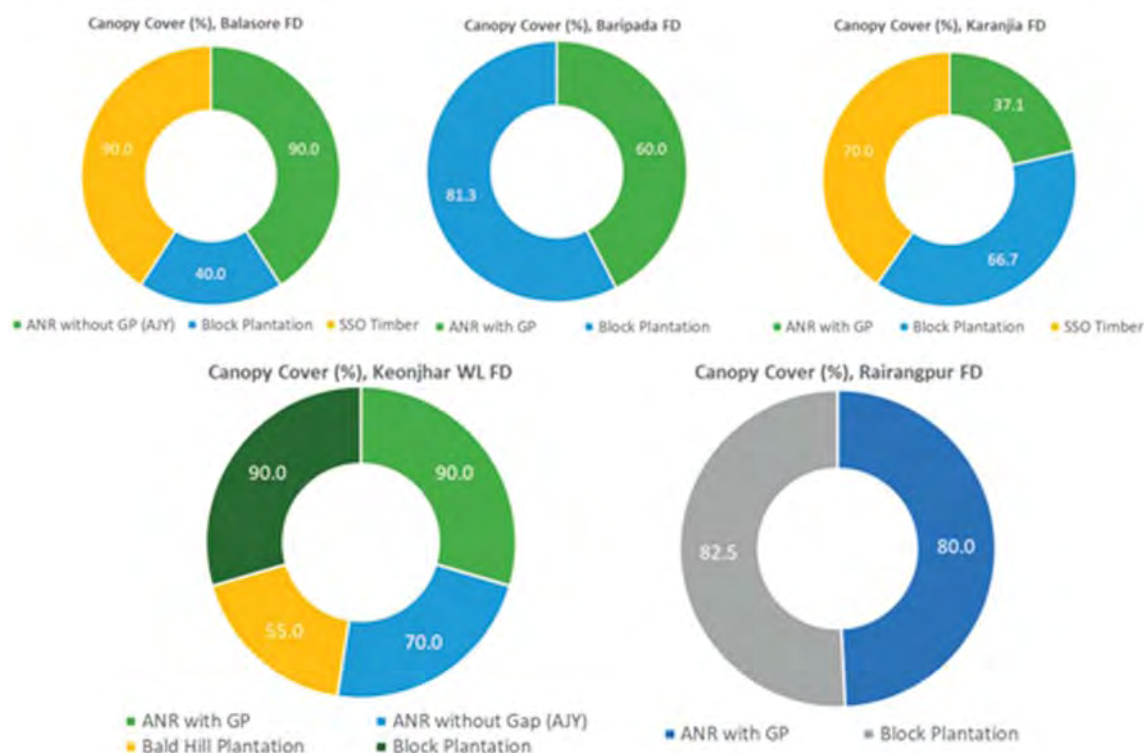


Figure 4.17: Canopy Cover in Plantation and Silviculture by FD

Irrespective of the years of plantation, highest of 33.3 percent sites have canopy cover of >10 & ≤20 percent and >80 percent in case of ANR with gap plantation. In case of bald hill plantation, 50.0 percent sites have canopy cover in the range of >20 & ≤30 percent and remaining 50.0 percent are in >70 & ≤80 percent. In case of block plantation, 23.5 percent sites have canopy cover >70 & ≤80 category and highest of 29.4 percent sites have canopy cover in the range of >80 percent. In case of silvicultural operation, canopy cover is >60 percent in all the cases. Ranking of canopy cover by plantation and silvicultural operational sites are presented in table.

Table 4.4: Canopy Cover Ranking by Plantation & Silviculture

Categories	Canopy Cover (%) Ranking (% Distribution)							Total
	≤10	>10 & ≤20	>20 & ≤30	>30 & ≤40	>40 & ≤50	>50 & ≤60	>60 & ≤70	
Plantation								
ANR with GP		33.3			13.3		20.0	100.0
Bald Hill Plantation			50.0				50.0	100.0
Block Plantation		11.8			17.6	17.6	23.5	100.0
Silviculture								
ANR without GP (AJY)						60.0	40.0	100.0
SSO Timber						37.5	62.5	100.0





Table 4.5: Canopy Cover (%) by Forest Division

Forest Division	<=10	>10 & <=20	>20 & <=30	>30 & <=40	>40 & <=50	>50 & <=60	>60 & <=70	>70 & <=80	>80	Total
Balasore										
ANR without GP (AJY)									100.0	100.0
Block Plantation		50.0			50.0					100.0
SSO Timber									100.0	100.0
Total		18.2			18.2				63.6	100.0
Baripada										
ANR with GP					100.0					100.0
Block Plantation								75.0	25.0	100.0
Total					33.3			50.0	16.7	100.0
Karanjia										
ANR with GP		71.4						28.6		100.0
Block Plantation					33.3	66.7				100.0
SSO Timber						100.0				100.0
Total	7.1	35.7			7.1	35.7	14.3			100.0
Keonjhar WL										
ANR with GP									100.0	100.0
ANR without GP (AJY)										100.0
Bald Hill Plantation			50.0					50.0		100.0
Block Plantation									100.0	100.0
Total			8.3			25.0	8.3	58.3		100.0
Rairangapur										
ANR with GP								100.0		100.0
Block Plantation						25.0	25.0	50.0		100.0
Total						20.0	40.0	40.0		100.0

#### 4.9 Display of Plantation Sites:

Pillars have been installed in different plantation sites and sites covered under silvicultural operations across the forest divisions in the circle. No. of pillars have been erected based on the plantation / silviculture area and shape of the plot. Area under plantation having marginally higher number of pillars than the silvicultural sites. About 96.6 percent plantation sites and 60.0 percent sites covered under silvicultural operations found having pillars. Mean and total pillars installed by plantation and silvicultural sites in different forest divisions are presented in the figure.





Figure 4:18: Installation of Pillars by Plantation Categories

#### 4.10 Soil and Moisture Conservation (SMC) Measures:

Different soil moisture conservation measures have been taken under CAMPA in both plantation sites and area under silvicultural operations. These SMC works have been taken up based on its locational suitability and assessed requirements. Different SMC activities taken up in plantation sites are staggered trench, half-moon trench, LB CD, check dam structure etc.

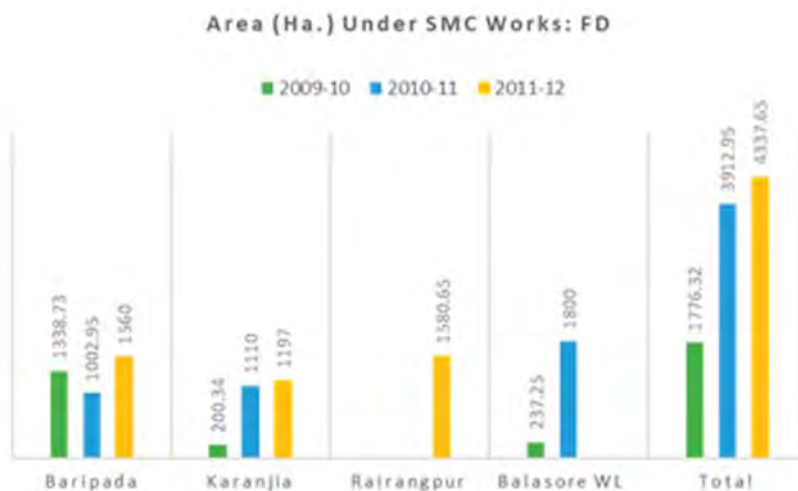


Figure 4:19: SMC Works in Forest Divisions

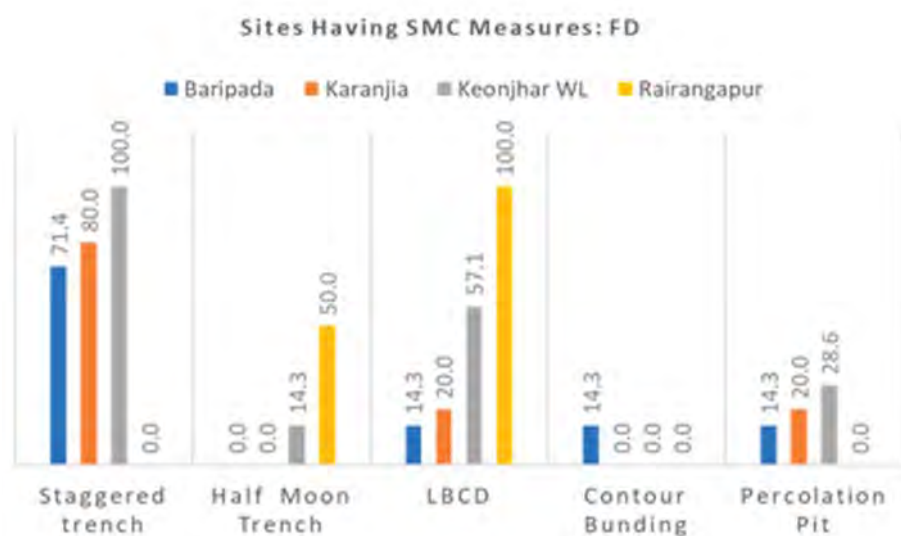
Source: Forest &amp; Environment Dept.







Under CAMPA different SMC works have been taken up in plantation sites with emphasis on staggered trench, half-moon trench and LBCD structures. Contour bunding and percolation pits have also been taken up in some sites. In silvicultural operations, staggered trench and LBCD structures have been constructed in maximum sites along with stone packing and percolation pits in some sites. More than one SMC works have also been taken up in different plantation and silvicultural sites in the forest circle.



*Figure 4:20: SMC Works by Forest Division*





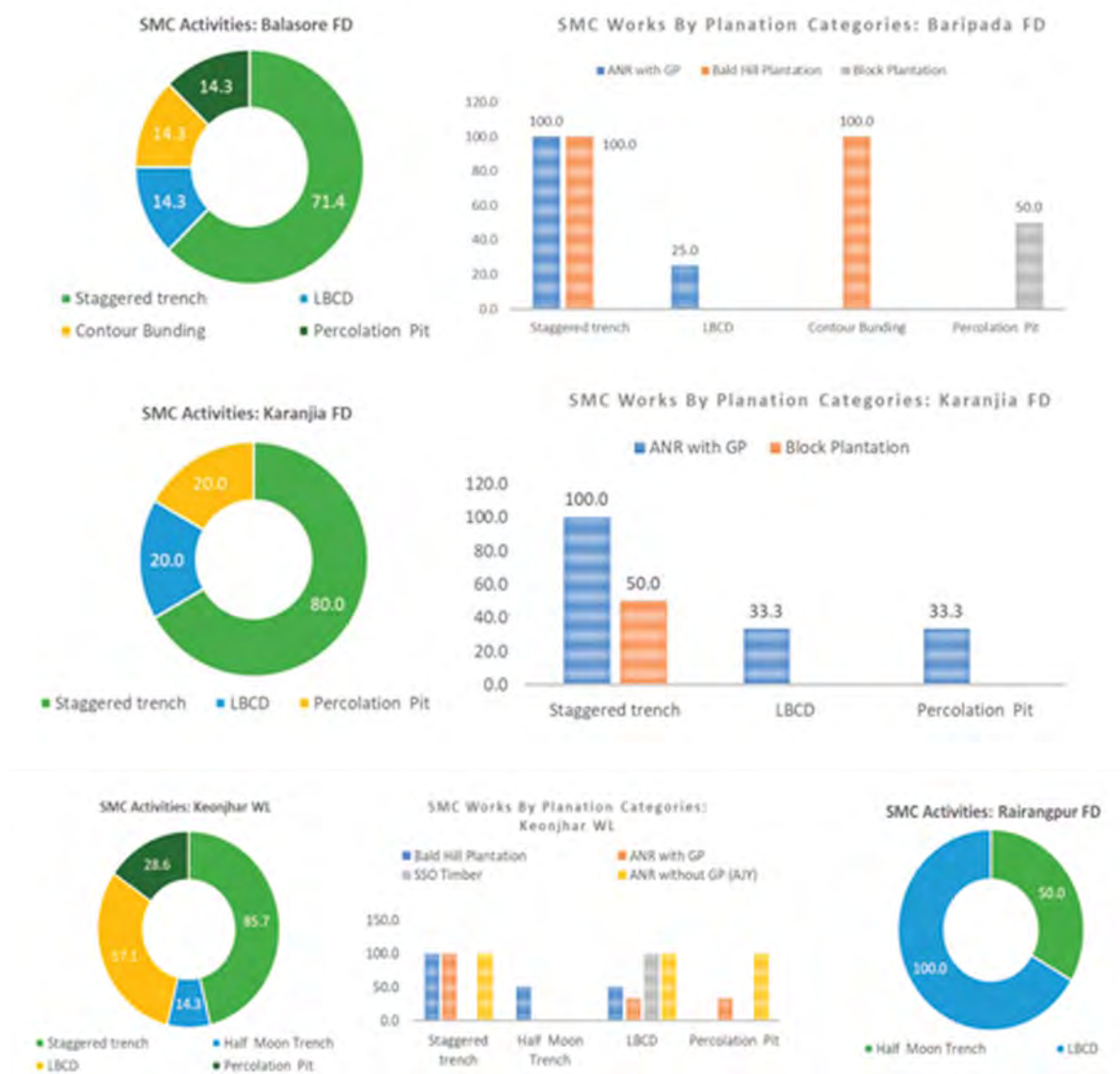
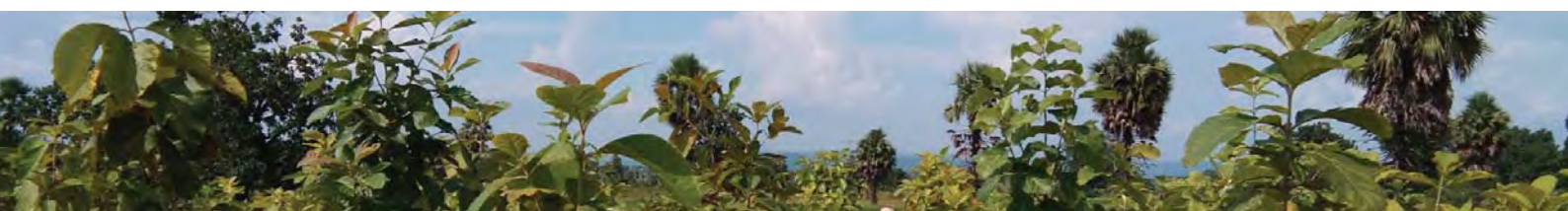


Figure 4:21: SMC Activities in Forest Divisions

Table 4.6: Single &amp; Multiple SMC Works in Plantation and Silviculture Site

Forest Divisions	Plantation / Silviculture	Distribution of Sites (%) by No. of SMC Works			
		Single SMC Work	Double SMC Works	> 2 SMC Works	Total
Baripada	ANR with GP	75.0	25.0		100.0
	Bald Hill Plantation		100.0		100.0
	Block Plantation	50.0			50.0
	Total	57.1	28.6		85.7
Karanjia	ANR with Gap	33.3	66.7		100.0





Forest Divisions	Plantation / Silviculture	Distribution of Sites (%) by No. of SMC Works			
		Single SMC Work	Double SMC Works	> 2 SMC Works	Total
	Block Plantation	50.0			50.0
	Total	40.0	40.0		80.0
Keonjhar WL	ANR with Gap	100.0		50.0	150.0
	ANR without Gap (AJY)			33.3	33.3
	Bald Hill Plantation	100.0		100.0	200.0
	SSO Timber	100.0			100.0
	Total	57.1		42.9	100.0
Rairangapur	ANR with Gap	50.0	50.0		100.0
	Total	50.0	50.0		100.0
Total Plantation	ANR with GP	63.6	36.4	9.1	109.1
	Bald Hill Plantation	50.0	50.0	50.0	150.0
	Block Plantation	50.0			50.0
	Total	58.8	29.4	11.8	100.0
Total Silviculture	ANR without Gap (AJY)			33.3	33.3
	SSO Timber	100.0			100.0
	<b>Total</b>	<b>25.0</b>		<b>25.0</b>	<b>50.0</b>

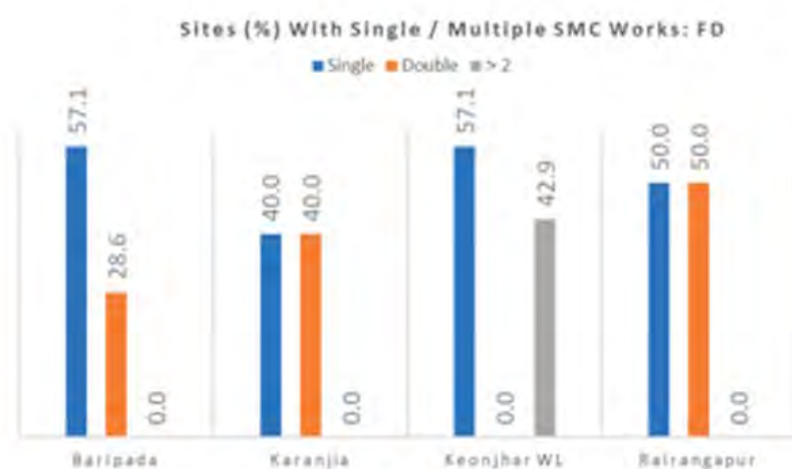


Figure 4:22: Single / Multiple SMC Works by Forest Division



### 4.11 Plant Height and GBH/GCH:

Height of the plants and girth of the plants of different species were measured to understand the growth factor. Growth of the plant by height and girth also represents the cultural practices and measures taken for ensuring appropriate nurturing of the plantation sites. The mean maximum height of the plants, irrespective of the year of plantation, location, type of plantation and plant species, calculated to be 5.0 mt. The mean minimum height of the plants at the circle level found to be 2.9 mt. for the plantation sites. Similarly, mean maximum GBH/GCH has been 24.1 cm and mean minimum GBH/GCH has been 12.5 cm.

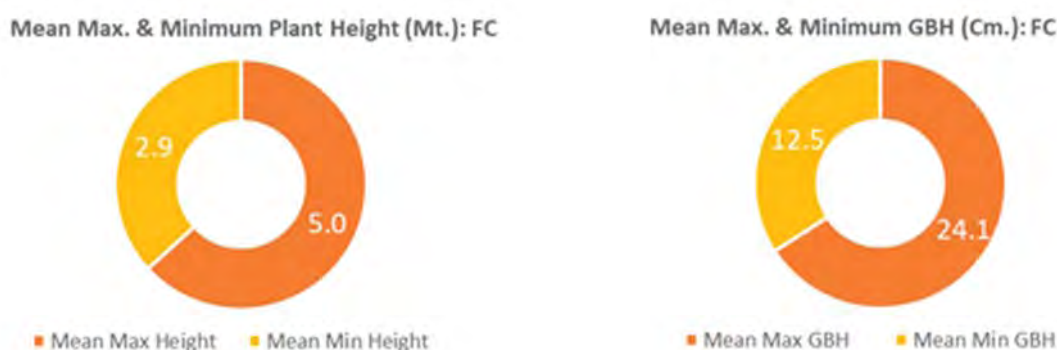


Figure 4:23: Height and GBH/GCH of Plants at Forest Circle Level

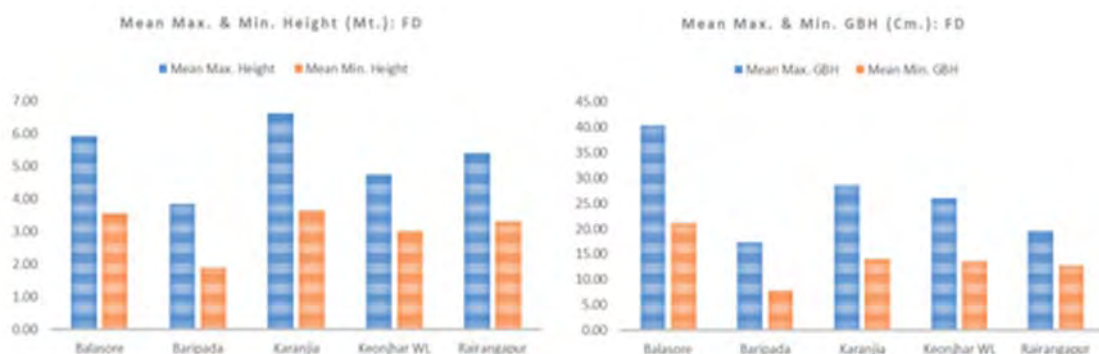


Figure 4:24: Height and GBH/GCH of Plants at Forest Division Level

Height and girth of the plants by forest divisions reflects that mean maximum height of the plants in plantation category is highest in Karanja (6.63 mt.) followed by Balasore (5.92 mt.) and lowest in Baripada (3.85 mt.). Similar trend is observed in case of mean minimum height, where Karanja is highest with 3.65 mt. and Baripada is lowest with 1.90 mt. Similarly, in case of mean maximum and mean minimum GBH/GCH, Balasore is the highest among all the forest divisions. Details are presented and discussed below. The mean maximum and mean minimum height of the plants planted under different plantation works and its GBH/GCH is presented in the diagram.





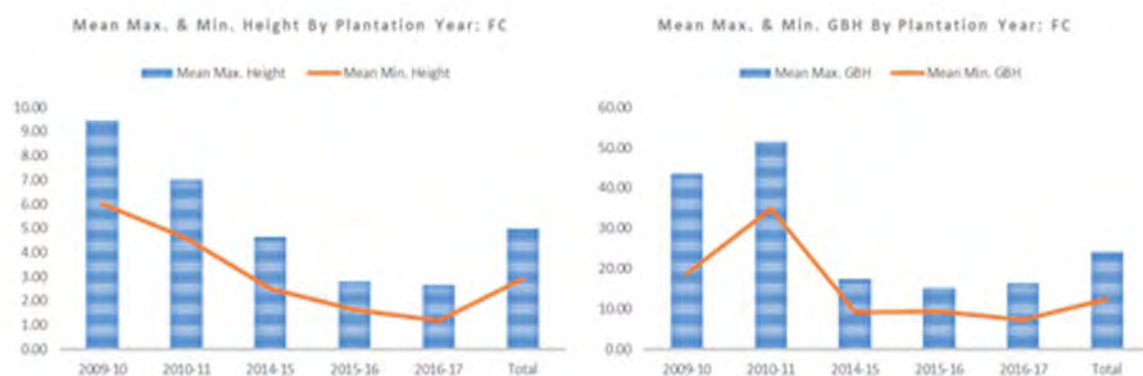


Figure 4:25: Year & Forest Division Wise Plant Height and GBH/GCH

Irrespective of the site and plant species, the plants planted in the year 2009-10, is having mean maximum height of 9.47 mt. and mean minimum height of 6.0 mt. The mean maximum and mean minimum GBH/GCH of the plants measured to be 43.54 cm. and 18.79 cm. respectively. The mean maximum and minimum height of the plants planted in the year 2009-10 is highest among all the plantations taken up in successive years. As observed from field level plant measurements, there is increment in plant height and girth with years of plantation, i.e., plants have grown with each passed year. However, plantations taken up in 2010-11 in studied site reported higher GBH/GCH measurement in comparison to plantations taken up in the year 2009-10.

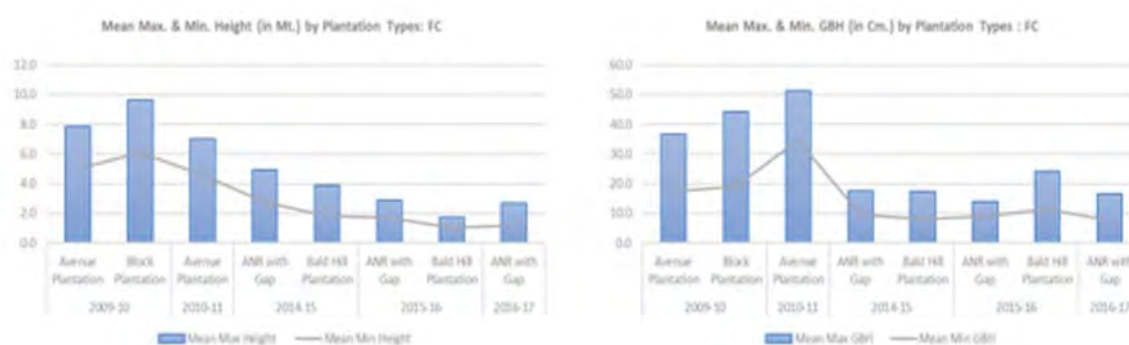
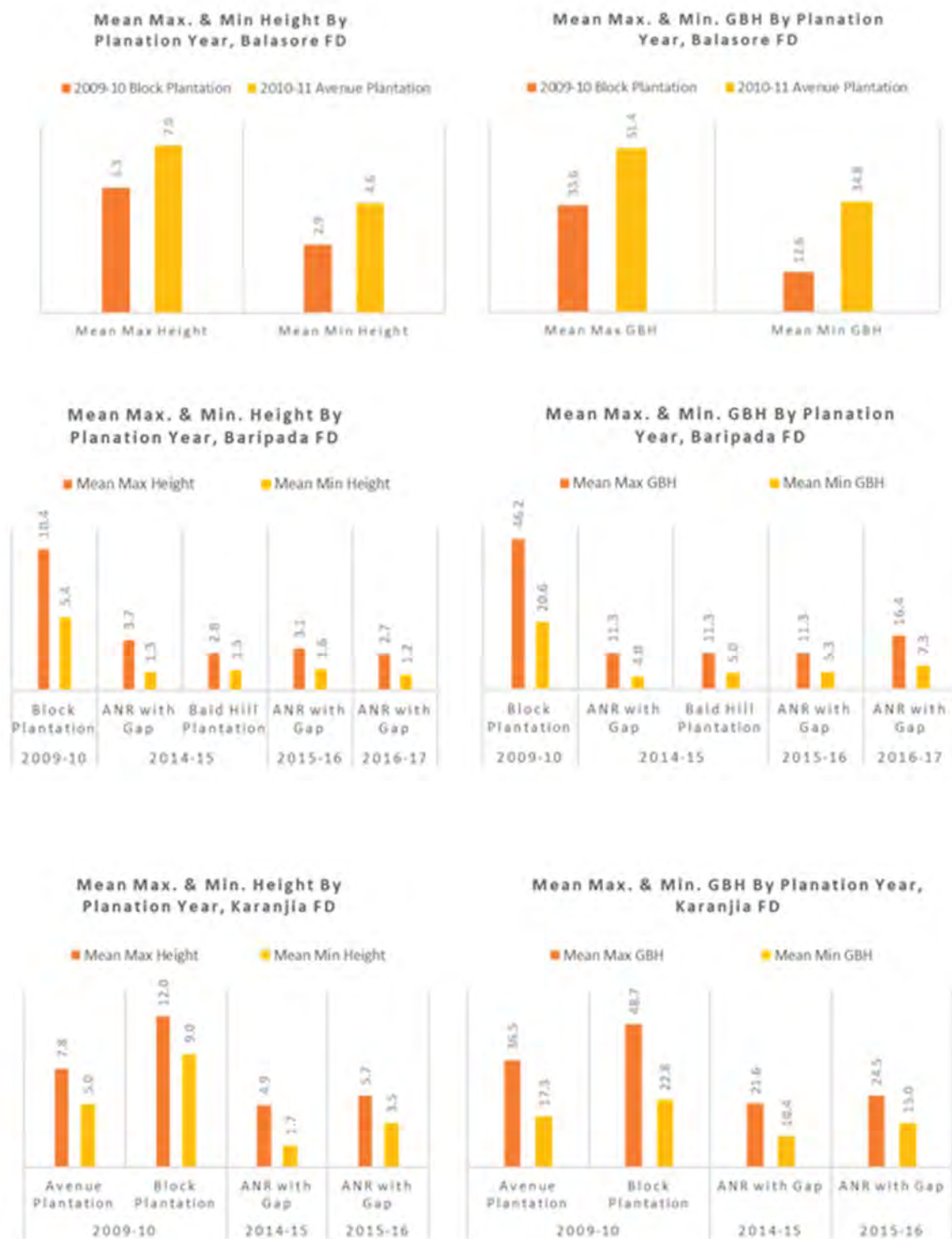


Figure 4:26: Mean Max. & Min. GBH/GCH by Plantation Categories

Examining by plantation types, it is observed that the mean maximum and minimum height (mt.) of the plants in 2009-10 block plantation is highest followed by avenue plantation done in the same year. However, in case of GBH/GCH, plants taken up under avenue plantation in the year 2011-12 is highest, followed by block plantation in the year 2009-10. The mean maximum and minimum height and GBH/GCH by year of plantation, plantation types and forest division are presented in the figures.







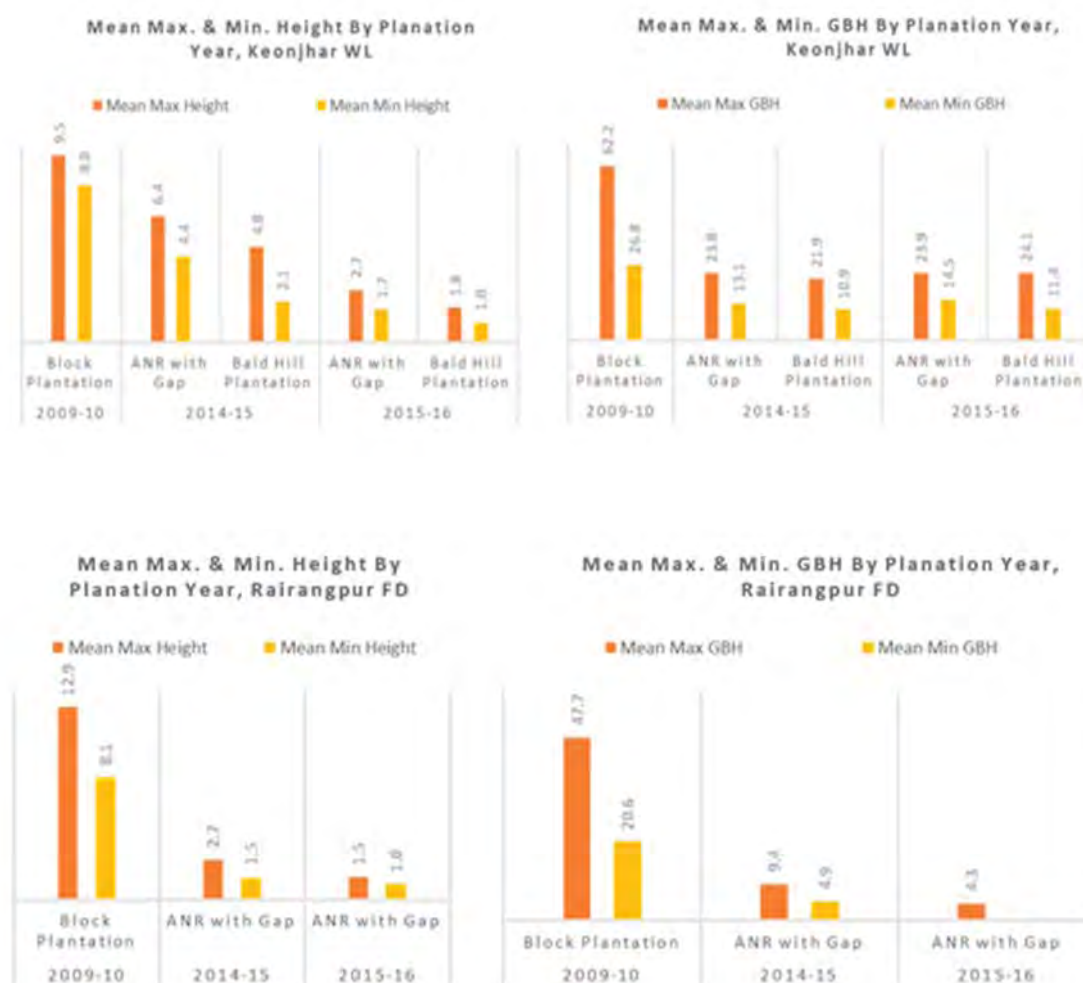


Figure 4:27: Mean Max. & Min. Height & GBH/GCH of Plants in Forest Divisions

Similar trend is observed in different forest divisions in the Baripada forest circle which indicates that there has been focus on different plantation activities and attempt is made to ensure growth and survival of the plants through various activities like security measures, SMC works etc. The mean maximum and mean minimum height and GBH/GCH of different plantation activities taken up in different forest divisions of the circle is presented in figure.

The plant growth per year, in terms of mean maximum and minimum height and GBH/GCH growth of the plants calculated based on the year of plantation. It is observed that per year growth of plants, irrespective of the species, varies by site and division. Mean maximum height growth of the plant per year observed in Karanjia and Keonjhar WL while mean maximum BGH growth of plants per year observed in Karanjia and Balasore.





Figure 4:28: Mean Max. & Min. Height & GBH/GCH Per Year

Average per year plant growth observed to be marginally higher in case of ANR with gap plantation (2014-15) and block plantation (2009-10). However, in case of GBH/GCH, per year growth of plants taken up under avenue plantation (2010-11) is highest among all categories, followed by ANR with gap plantation (2016-17). Per year mean maximum and minimum growth of the plants (height and GBH/GCH) by forest division is presented in the figures 4.29.





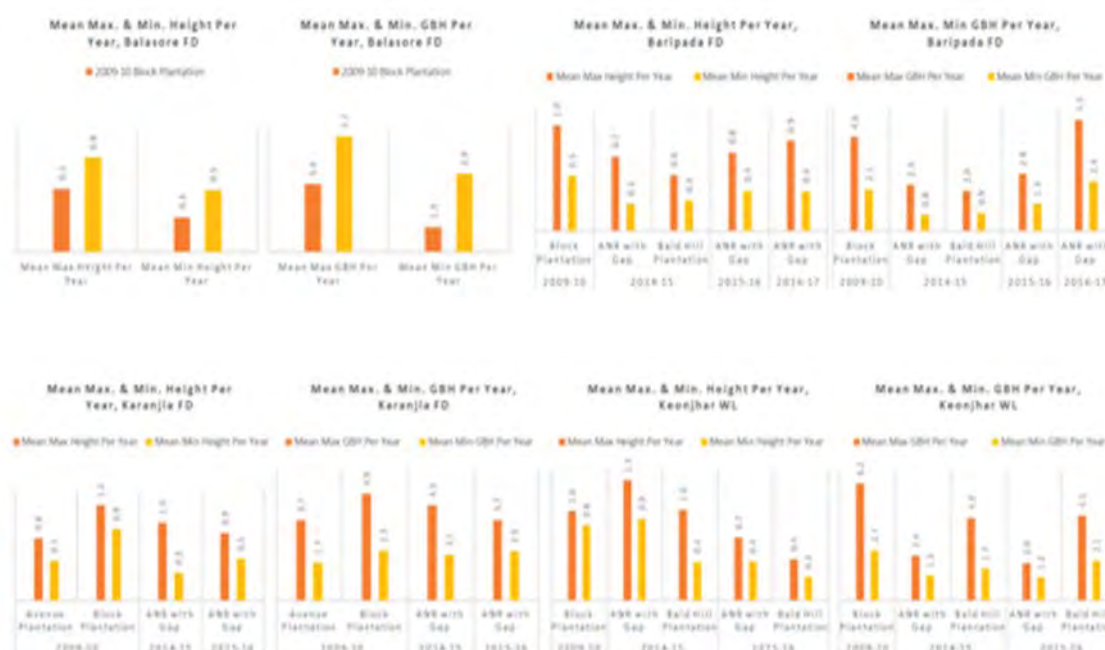


Figure 4:29: Mean Max. &amp; Min. Height &amp; GBH/GCH Per Year in Forest Divisions

Table 4.7: Ranking of Mean Maximum Plant Height by Plantation Types

Year	Plantation Types	Rank of Mean Maximum Height (in Mt.) of Plants in Sites (% Distribution)							Total
		R.1	R.2	R.3	R.4	R.5	R.6	R.7	
		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14	>14 & <=17	>17 & <=20	
2009-10	Avenue Plantation		33.3		66.7				100.0
	Block Plantation		26.9	11.5	23.1	19.2	15.4	3.8	100.0
	Total		27.6	10.3	27.6	17.2	13.8	3.4	100.0
2010-11	Avenue Plantation		20.0	60.0	20.0				100.0
	Total		20.0	60.0	20.0				100.0
2014-15	ANR with Gap	18.8	54.2	6.3	18.8	2.1			100.0
	Bald Hill Plantation	41.2	23.5	35.3					100.0
	Total	24.6	46.2	13.8	13.8	1.5			100.0
2015-16	ANR with Gap	59.5	21.6	18.9					100.0
	Bald Hill Plantation	75.0	25.0						100.0
	Total	61.0	22.0	17.1					100.0

Year	Plantation Types	Rank of Mean Maximum Height (in Mt.) of Plants in Sites (% Distribution)							
		R.1	R.2	R.3	R.4	R.5	R.6	R.7	Total
		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14	>14 & <=17	>17 & <=20	
2016-17	ANR with Gap	33.3	66.7						100.0
	Total	33.3	66.7						100.0
Total	ANR with Gap	36.1	43.3	10.3	9.3	1.0			100.0
	Avenue Plantation		25.0	37.5	37.5				100.0
	Bald Hill Plantation	47.6	23.8	28.6					100.0
	Block Plantation		26.9	11.5	23.1	19.2	15.4	3.8	100.0
	<b>Total</b>	<b>29.6</b>	<b>36.8</b>	<b>14.5</b>	<b>11.8</b>	<b>3.9</b>	<b>2.6</b>	<b>0.7</b>	<b>100.0</b>

Table 4.8: Ranking of Mean Minimum Plant Height by Plantation Types

Year	Plantation Types	Rank of Mean Minimum Height (in Mt.) of Plants in Sites (% Distribution)						
		R.1	R.2	R.3	R.4	R.5	R.6	Total
		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14	>14 & <=17	
2009-10	Avenue Plantation		33.3	66.7				100.0
	Block Plantation	23.1	23.1	23.1	23.1	3.8	3.8	100.0
	Total	20.7	24.1	27.6	20.7	3.4	3.4	100.0
2010-11	Avenue Plantation	20.0	60.0	20.0				100.0
	Total	20.0	60.0	20.0				100.0
2014-15	ANR with Gap	64.6	14.6	20.8				100.0
	Bald Hill Plantation	70.6	29.4					100.0
	Total	66.2	18.5	15.4				100.0
2015-16	ANR with Gap	70.3	29.7					100.0
	Bald Hill Plantation	100.0						100.0
	Total	73.2	26.8					100.0
2016-17	ANR with Gap	100.0						100.0
		100.0						100.0
Total	ANR with Gap	71.1	18.6	10.3				100.0
	Avenue Plantation	12.5	50.0	37.5				100.0
	Bald Hill Plantation	76.2	23.8					100.0
	Block Plantation	23.1	23.1	23.1	23.1	3.8	3.8	100.0
	<b>Total</b>	<b>60.5</b>	<b>21.7</b>	<b>12.5</b>	<b>3.9</b>	<b>0.7</b>	<b>0.7</b>	<b>100.0</b>





Table 4.9: Ranking of Mean Maximum GBH/GCH of Plants by Plantation Types

Year	Plantation Types	Ranking of Mean Max. GBH/GCH (in Cm.) of Plants in Sites (% Distribution)								
		1	2	3	4	5	6	7	8	Total
		<5	>5 &≤10	>10 &≤20	>20 &≤30	>30 &≤45	>45 &≤60	>60 &≤80	>80 &≤100	
2009-10	Avenue Plantation				33.3	33.3	33.3			100.0
	Block Plantation			7.7	15.4	30.8	30.8	11.5	3.8	100.0
	Total			6.9	17.2	31.0	31.0	10.3	3.4	100.0
2010-11	Avenue Plantation			20.0		40.0		40.0		100.0
	Total			20.0		40.0		40.0		100.0
2014-15	ANR with Gap	25.0	10.4	31.3	29.2	4.2				100.0
	Bald Hill Plantation	5.9	29.4	29.4	29.4	5.9				100.0
	Total	20.0	15.4	30.8	29.2	4.6				100.0
2015-16	ANR with Gap	54.1	5.4	21.6	16.2	2.7				100.0
	Bald Hill Plantation	25.0	0.0	25.0	25.0	25.0				100.0
	Total	51.2	4.9	22.0	17.1	4.9				100.0
2016-17	ANR with Gap			91.7	8.3					100.0
	Total			91.7	8.3					100.0
Total	ANR with Gap	33.0	7.2	35.1	21.6	3.1				100.0
	Avenue Plantation			12.5	12.5	37.5	12.5	25.0		100.0
	Bald Hill Plantation	9.5	23.8	28.6	28.6	9.5				100.0
	Block Plantation			7.7	15.4	30.8	30.8	11.5	3.8	100.0
	Total	22.4	7.9	28.3	21.1	10.5	5.9	3.3	0.7	100.0

Table 4.10: Ranking of Mean Minimum GBH/GCH of Plants by Plantation Types

Year	Plantation Types	Ranking of Mean Min. GBH/GCH (in Cm.) of Plants in Sites (% Distribution)						
		R.1	R.2	R.3	R.4	R.5	R.6	Total
		<5	>5 & <=10	>10 & <=20	>20 & <=30	>30 & <=45	>45 & <=60	
2009-10	Avenue Plantation			66.7	33.3			100.0
	Block Plantation		15.4	34.6	46.2	3.8		100.0
	Total		13.8	37.9	44.8	3.4		100.0



Year	Plantation Types	Ranking of Mean Min. GBH/GCH (in Cm.) of Plants in Sites (% Distribution)						
		R.1	R.2	R.3	R.4	R.5	R.6	Total
		<5	>5 & <=10	>10 & <=20	>20 & <=30	>30 & <=45	>45 & <=60	
2010-11	Avenue Plantation			20.0	20.0	20.0	40.0	100.0
	Total			20.0	20.0	20.0	40.0	100.0
2014-15	ANR with Gap	50.0	22.9	25.0	2.1			100.0
	Bald Hill Plantation	47.1	35.3	17.6				100.0
	Total	49.2	26.2	23.1	1.5			100.0
2015-16	ANR with Gap	70.3	5.4	24.3				100.0
	Bald Hill Plantation	25.0	25.0	50.0				100.0
	Total	65.9	7.3	26.8				100.0
2016-17	ANR with Gap	8.3	83.3	8.3				100.0
	Total	8.3	83.3	8.3				100.0
Total	ANR with Gap	52.6	23.7	22.7	1.0			100.0
	Avenue Plantation			37.5	25.0	12.5	25.0	100.0
	Bald Hill Plantation	42.9	33.3	23.8				100.0
	Block Plantation		15.4	34.6	46.2	3.8		100.0
	<b>Total</b>	<b>39.5</b>	<b>22.4</b>	<b>25.7</b>	<b>9.9</b>	<b>1.3</b>	<b>1.3</b>	<b>100.0</b>

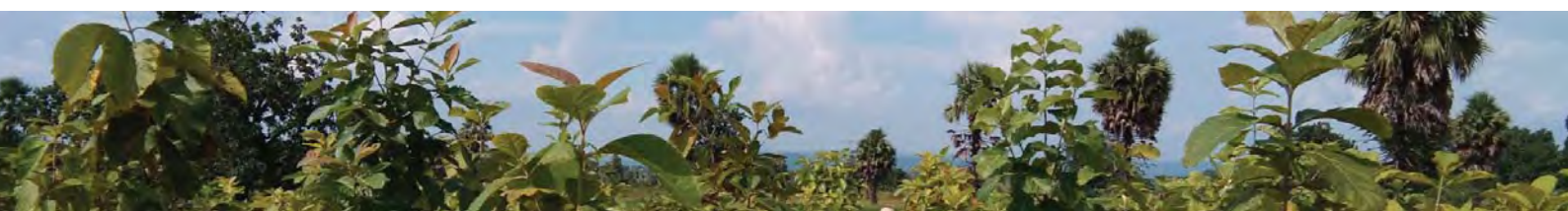
#### 4.12 Plant Protection Measures:

Different plant protection measures have been taken in all the forest divisions to improve plant survival rate. Plant protection measures taken are like fencing, fire protection measures, watch and ward etc. In certain cases, villages and VSS have been found taking care of the local forest area and plantation sites. At the circle level, covering all the forest divisions, it is found that high emphasis is given to watch and ward among all the protection measures. For old plantations (like plantation of 2009-10), watch and ward provision was made for three years, excluding the plantation year. In the later stage, the site was covered under general monitoring and supervision. But for the plantations taken up in 2016-17 and 2017-18, watch and ward observed at the site level. In specific cases, fire protection measures have also been taken.

#### 4.13 Record Keeping and Documentation:

Different records / documents are maintained at the range office level with respect to plantation / silvicultural activities, such as plantation journal, plantation site map, treatment map and other registers. Plantation journal is observed for 90.3 percent plantation sites, covering all the forest divisions of the circle. Journal for plantation activities found for all the sites in case of Karanjia forest division, Keonjhar WL and Rairangpur forest division. About 90.3 percent sites, across different forest divisions, have plantation site map and map of all the plantation sites found in Karanjia, Keonjhar and Rairangpur.

Micro plan is found not prepared in all the forest divisions for most of the sites which includes plantation and/or silvicultural operations. Whereas, treatment map observed for 61.3 percent plantation sites and 60.0 percent sites covered under silvicultural operations. In Karanjia FD and Keonjhar WL, all the plantation sites and sites covered under silvicultural operations have treatment map while in Rairangpur forest





division, all the sites covered under plantation have treatment map. Micro plan is not observed in most of the cases, excluding sites covered under AJY. Details are presented in the diagram.

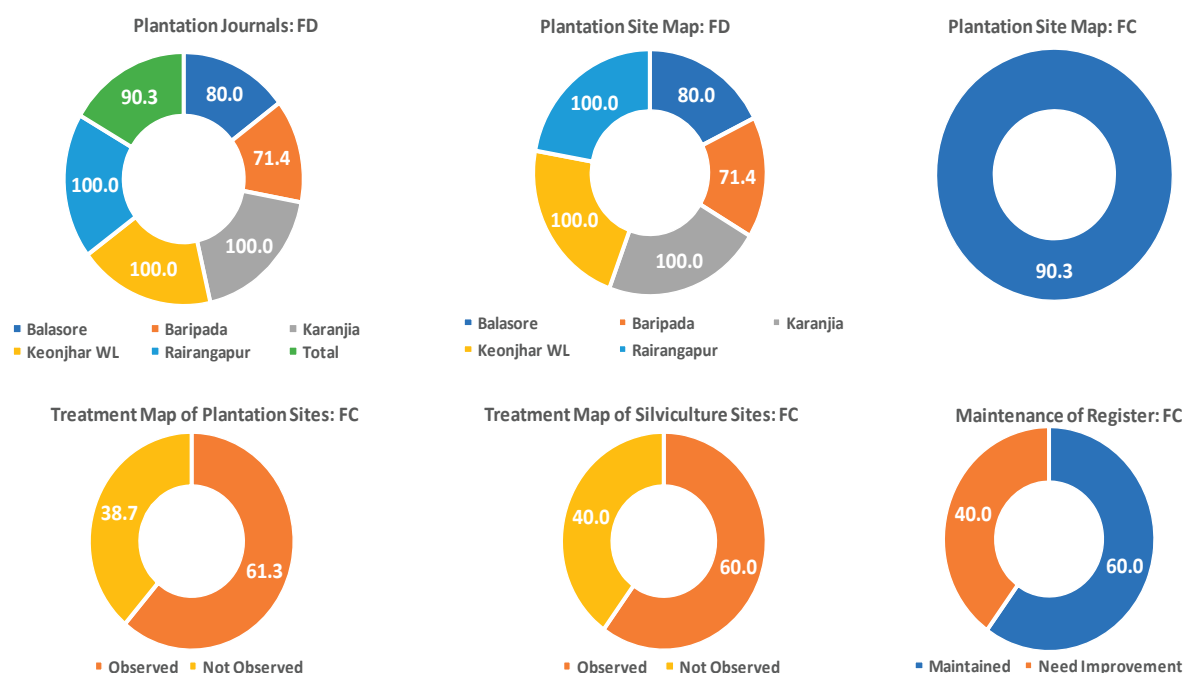


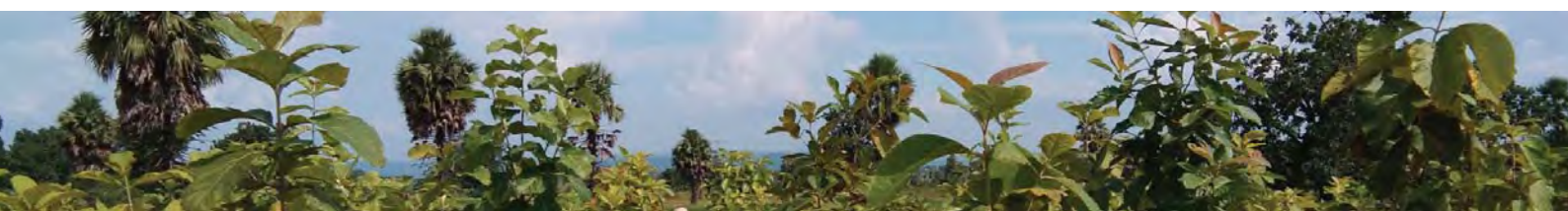
Figure 4:30: Different Records Maintained

## 4.16 Ama Jungle Yojna

Out of six forest divisions in Baripada circle, AJY is promoted under CAMPA in two forest divisions Keonjhar Wild Life and Balasore Wild Life. Basing on the information obtained from two sample AJYs, it is found that all the functioning VSSs involved in AJY are adhering CAMPA guidelines in their day to day operations. There are pre planning before undertaking plantation activities. The VSS members were found involved in various stages of activities. They maintain good relationship with forest department officials.

Table 4.11: VSSs involvement in CAMPA Activities

Sl. No	Name of the VSS/ Division/ Range/ Section / Beat/ Village	Following CAMPA Guidleines	Pre planning	Involvement in various stages	Project planning	Adhering to Project Implem-entation	Good relationship and cooperation
1	Kaliamba EDC Keonjhar WL/ Hadagarh/ Hadagarh/ Sangam/ Kaliamba	Yes	Yes	Yes	Yes	Yes	Yes
2	Duibandhu VSS Balasore WL/ Nilagiri/ Sajanaguda/ Matiali/ Analapali	Yes	Yes	Yes	Yes	Yes	Yes



#### 4.14.1 Practices followed

It was found that the VSSs are regularly conducting meetings and attendance rate in the meetings is found average. Records and registers are properly maintained. The wage payment for the labourers is made in cash and on daily basis.

Table 4.12: Type of Major Practices followed by the VSSs

Sl. No	Name of the VSS/ Division/ Range/ Section / Beat/ Village	Frequency of JFA meeting	Attendance rate in meeting	Held of awareness prog	Trained of forest coverage/ plantation	Maintenance of VSS Register	Wage payment system	Mode of payment	Training prog. Organised in your area
1	Kaliamba EDC Keonjhar WL/ Hadagarh/ Hadagarh/ Sangam/ Kaliamba	Always	Average	No	Improved	Properly maintained	Daily	Cash	No
2	Duibandhu VSS Balasore WL/ Nilagiri/ Sajanaguda/ Matiali/ Analapali	Always	Average	No	Improved	Properly maintained	Daily	Cash	No

#### 4.14.2 Impacts of CAMPA

Due to CAMPA support, status of plantation is found to have been improved in all the VSS areas, and frequency of forest fire incidences is not witnessed. Frequency human animal conflict is not reported. Due to CAMPA supported plantation and SMC works, water level in forest fringe villages tended to increase.

Table 4.13: Impact of CAMPA

Sl. No	Name of the VSS/ Division/ Range/ Section / Beat/ Village	Mode of protection of plantation	Frequency of fire incident	Practice of Podu cultivation	wild animal visit	Mitigation plan for human animal conflict	Frequency the human Animal conflict	Change of water level after plantation under CAMP
1	Ghodakhunta VSS Nabarangpur/ Umarkote/ Singisani/ Godakhunta / Ghodakunta	Labour	Never	No	No	No	Never	Increased
2	Simagudi VSS Malkanagiri/ Malkanagiri / Malkanagiri / Champakhari/ Simagudi	Labour	Never	No	No	No	Never	Increased





### **Case Study: Meadow Development at Jenabil Section of STR provides opportunities to tigers to catch their prey**

A meadow is an open habitat, or field, vegetated by grass and other non-woody plants. They attract a multitude of wildlife for food and shelter. They provide areas for courtship displays, nesting, food gathering, and sometimes sheltering, if the vegetation is high enough, making them ecologically important. STR division have developed a number of meadows to harbour majority of the herbivore population of the reserve. One such unique meadow is developed in the plains of Jenabil Range of STR division. The meadow is spread over an area of 36.2 hectare of land. The meadow is a natural meadow developed only through maintenance of the forest department. The area was previously encroached by local people. It was used as an agricultural field for cultivation of rice and vegetables. After the enforcement of Land acquisition law, those villagers were relocated with due compensation to the buffer of the biosphere reserve.

The land since then has been developed into a meadow by the forest officials through CAMPA fund. The development of the meadow includes various activities such as weed eradication and segment cutting. The particular meadow is a segment meadow. The grasses are cut into segments of 20 metres. It is done in order to develop tender and more palatable grasses for the herbivores. The bigger section of grass creates an ambush for the tiger to catch their prey easily. Number of animals including Deer, Sambar, barking deer, Bison are sighted almost all times of a day. A watcher tower is built at distant from the meadow for protection of the animals from poachers. A full-time watcher is appointed through CAMPA fund for the protection purpose. In order to protect the watch from the wild animals, an elephant proof trench has been built around the meadow.



## 4.15 Assessment Observations:

**Forest Circle:** Baripada

**Forest Division:** Keonjhar WL

Table 4.14: Observations; Keonjhar WL

Type of Assets	Observations
Bald Hill Plantation/ Anandapur/ Ramchandrapur/ Patilo	<ol style="list-style-type: none"> <li>1. The Bald Hill Plantation is successful in this site.</li> <li>2. The site was completely degraded due to mining activity. After CAMPA intervention, green cover is visible;</li> <li>3. Site/s is having green fencing with bamboo;</li> <li>4. Site maintenance was done up to 4th year of plantation for which plant density appears to be considerably good.</li> </ol>
Bald Hill Plantation/ Hadagada/ Hadagada/ Baidakhiya	<ol style="list-style-type: none"> <li>1. The site was completely bald and degraded before CAMPA intervention;</li> <li>2. After the construction of SMC structures, grasses grown and plantation activity was initiated;</li> <li>3. Plant survival has been good and vegetation cover also observed to be good;</li> <li>4. Growth of weeds found in some patches.</li> </ol>
ANR with Gap/ Anandapur/ Gayalmunda / Panasdiha	<ol style="list-style-type: none"> <li>1. The area was encroached by the locals prior to CAMPA Intervention;</li> <li>2. In one patch of the retrieved land, cashew plantation has been done for economic return to the local and strengthening their livelihood while maintaining the green cover. This step was taken after due consultation with the local people. This step ensured plant survival as well as livelihood support mechanism;</li> <li>3. Other patches of land have been covered with Teak and Acacia;</li> <li>4. Villagers involvement in forest protection along with their livelihood restoration has resulted with plant survival and green cover improvement.</li> </ol>
ANR with Gap/ Brahmanipal/ Brahmanipal/ Brahmanipal	<ol style="list-style-type: none"> <li>1. The plantation is not done in block mode but in patch wise</li> <li>2. Natural species include Asan, chara, Mahula, sal</li> </ol>
ANR with Gap/ Brahmanipal/ Brahmanipal/ Baliparbat	<ol style="list-style-type: none"> <li>1. Gap Plantation has been done in an already existing natural forest;</li> <li>2. Tree are planted randomly at gap locations as a part of enrichment;</li> <li>3. In the plantation, 200 plants per ha. norm was followed;</li> <li>4. It was observed that about 4-5 tribal families, who live inside the forest, depend on forest for their livelihood;</li> <li>5. The forest is having natural species include Sal, Kanrada, Asana, Chara, Dhaura, Kendu, Pia sal, Sidha, Babul, Jammu</li> </ol>





Type of Assets	Observations
SSO Timber /Anandapur/ Gayalmunda/ Gayalmunda	<ol style="list-style-type: none"> <li>1. LBCD structure has been done in the treatment area to increase soil moisture regime;</li> <li>2. Natural Species include Sal, Chara, Dhaura, Bahada, Amla, Karada</li> <li>3. From the year 2018-19, silviculture operations &amp; SMC works are being carried out in the site</li> </ol>
Block Plantation/ Brahmanipal/ Daitari/ Talpada	<ol style="list-style-type: none"> <li>1. Before CAMPA intervention, the site was a weed prone area. Due to CAMPA intervention, it is converted into a forest (teak forest);</li> <li>2. The local VSS is associated in the process;</li> <li>3. Natural regeneration of plants is very high</li> <li>4. Natural species include Sal, Kangada, Asana, Chara, Dhaura, Kendu, Pia sal, Sidha</li> </ol>
ANR without Gap (AJY)/ Hadagarh/ Hadagarh/ Sangam	<ol style="list-style-type: none"> <li>1. The local people are organised in to VSS to safeguard the forest;</li> <li>2. The VSS has been collecting NTFP from the forest for their livelihood;</li> <li>3. Villagers prepare leaf plates and sell it in the local market to earn their livelihood;</li> <li>4. The forest is having natural species like Sal, Mai, Chara, Asana, Kendu, Neem, Kusum, Nidrabati, Mahula</li> </ol>

**Forest Circle:** Baripada

**Forest Division:** Rairangpur

Table 4.15: Observations; Rairangpur FD

Type of Assets	Observations
Block Plantation/ Bisoi/ Bankidihi/ Bankidihi	<ol style="list-style-type: none"> <li>1. The site seems clean, well maintained and beautiful Acacia forest;</li> <li>2. Plants are full grown with about 95% canopy cover;</li> <li>3. The community is in full support and collect leaves instead of wood for fuel;</li> <li>4. Most tree are bifurcated / multichotomies at the trunk base.</li> </ol>
Block Plantation/ Bisoi/Bankidihi/ Bankidihi	<ol style="list-style-type: none"> <li>1. It is observed that one patch is sparsely dense while another patch is very dense;</li> <li>2. The site is located near a water body for which watering of the plant has become easy;</li> <li>3. The site is also in a close proximity to elephant habitation / transit movement route.</li> </ol>
Block Plantation/ Badampahar/ Hatabadla/ Dubulabada	<ol style="list-style-type: none"> <li>1. Natural regenerations of different plant species observed in the site;</li> <li>2. The initiative has been supportive in restoration of elephant corridor.</li> </ol>



Type of Assets	Observations
Block Plantation/ Badampahar/ Badampahar/ Purunapani	<ol style="list-style-type: none"> <li>1. The site was a barren land which was converted to a green cover area under CAMPA;</li> <li>2. Regeneration of different plant species found to be good;</li> <li>3. Due to de-weeding and maintenance, the site appears clean;</li> <li>4. The plant survival rate found to be good in the site.</li> </ol>
ANR with Gap Plantation/ Rairangpur/ Badamtoli/ Bijatola	<ol style="list-style-type: none"> <li>1. Initially, Acacia was planted in the site but the plantation did not survive. So, teak was planted as a part of casualty replacement;</li> <li>2. Enrichment plantation was done in the site as some patches were having poor plant density;</li> <li>3. Natural species in the site include Sal, Mahula, Chara, Kendu, Jammun, Kendu;</li> <li>4. Sal naturally has regenerated in some places and having dense cover.</li> </ol>
ANR with Gap Plantation/ Badampat/ Suleipat/ Jamjhari	<ol style="list-style-type: none"> <li>1. Plant regeneration observed to be good in the site;</li> <li>2. The site is having natural species, like Mahula, Chara, Sal, Pia sal, Pahadia, Sissoo, Kusum</li> <li>3. The enrichment planting has been supportive in restoration of elephant corridor.</li> </ol>

**Forest Circle:** Baripada

**Forest Division:** Karanjia

Table 4.16: Observations, Karanjia FD

Type of Assets	Observations
ANR with Gap Plantation/ Thakurmunda/ Thakurmunda/ Thakurmunda	<ol style="list-style-type: none"> <li>1. The site is topographically plain and located besides the local road;</li> <li>2. The site was previously encroached by the local for agricultural purpose;</li> <li>3. As a part of retrieval and revival of the site, VSS was formed taking local people;</li> <li>4. With the association of VSS, enrichment plantation was taken up in the site;</li> <li>5. It is observed that Acacia has good growth due to soil suitability but teak is still in stump size;</li> <li>6. With increased plant density, there has been improvement in green cover.</li> </ol>
ANR with Gap Plantation/ Karanjia/ Ghagarabada/ Ghagarabada	<ol style="list-style-type: none"> <li>1. The site is having plain topography and located besides the local road;</li> <li>2. The site was previously under social forestry which is now taken up under ANR with Gap plantation;</li> <li>3. Enrichment planting is not done in block mode;</li> <li>4. The site is having natural species, like Sal, Dhaura, Chara, Kendu, Jamun, Palasa etc.</li> </ol>





Type of Assets	Observations
ANR with Gap/ Dudhianali/ Tato/ Dari	<ol style="list-style-type: none"> <li>1. The area was degraded due to China Clay mining and later used for industrial purpose;</li> <li>2. The site was taken up under ANR with gap filling to improve the green cover;</li> <li>3. Plant growth found to be good and the site is under rapid restoration process;</li> <li>4. Grass cover observed in the site;</li> </ol>
SSO Timber/ Thakurmunda/ Champajhar/ Ghatiadhar	<ol style="list-style-type: none"> <li>1. The forest found to be dense;</li> <li>2. Silvicultural operations taken up are like cleaning, pruning, high stump cutting and climber cutting;</li> <li>3. Some of the natural species that are found are Sal, Chara, Mahula, Kurei Asana, Kendu etc.</li> <li>4. Silvicultural operation has helped to make the forest dense and increase forest cover;</li> </ol>
Block Plantation/ Karanjia/ Ghagarabada/ Ghagarabada	<ol style="list-style-type: none"> <li>1. The site is having plain topography and located besides the local road;</li> <li>2. The site having Acacia plantation found to have normal growth.</li> </ol>
Avenue Plantation/ Karanjia/ Singda/ Haldia	<ol style="list-style-type: none"> <li>1. Plantation is done in 6 rows which is not conventional avenue plantation;</li> <li>2. Patch wise plantation is done as per the availability of open space</li> </ol>
Block Plantation / Dudhianali/ Tangabila/ Tangabila	<ol style="list-style-type: none"> <li>1. The area was completely barren prior CAMPA intervention;</li> <li>2. Due to CAMPA intervention, forest have grown in the site;</li> <li>3. Cases of wood cutting by the local is reported;</li> <li>4. Due to this plantation, the local Sal forest is saved as these trees give alternative fuel wood to the locals.</li> </ol>

**Forest Circle:** Baripada

**Forest Division:** Baripada

Table 4.17: Observations; Baripada FD

Type of Assets	Observations
ANR with Gap Deuli/Badsahi/ Badsahi	<ol style="list-style-type: none"> <li>1. Initially, the site was under social forestry. But observing degradation of the vegetation cover, it was converted and taken up under ANR with enrichment planting;</li> <li>2. The enrichment planting activity was taken up in the year 2015-16;</li> <li>3. Growth of the plants observed to be good. In enrichment planting, spacing of 2.5m. is adopted;</li> <li>4. Some natural species found in the forest like Kendu;</li> </ol>



Type of Assets	Observations
ANR with Gap/ Deuli/ Deuli/ Deuli	<ol style="list-style-type: none"> <li>1. The site is nearer to the local road;</li> <li>2. SMC works have been taken up in the / nearer to the site like construction of staggered trench of size 2.5m*0.5m*0.5m;</li> <li>3. No of stagger trenches in 1 ha is about 60;</li> <li>4. Plain and barren land have now being converted to a good patch of plantation;</li> <li>5. Silviculture operation has also been carried out in the site.</li> </ol>
ANR with Gap/ Dukura/ Tadki/ Dukura	<ol style="list-style-type: none"> <li>1. The site was previously covered under social forestry. But due to its gradual degradation, it was taken up under ANR with enrichment planting with the help of VSS;</li> <li>2. Acacia &amp; Eucalyptus were previously grown in the site;</li> <li>3. The degraded land is being converted to green land under CAMPA intervention which has been beneficial to the locals;</li> <li>4. The site has been a part of the elephant corridor;</li> <li>5. Now Acacia, Jamun, Karanja etc. are planted</li> </ol>
ANR with Gap/ Deuli/Deuli/ Kaliasole	<ol style="list-style-type: none"> <li>1. Enrichment planning, 40,000 plants planted at the rate 200 plants per ha.;</li> <li>2. This site was previously (till 2015) encroached and used as agriculture field;</li> <li>3. Measures taken to plant indigenous species in the site.</li> </ol>
Bald Hill Plantation/ Bangiriposi/ Bangiriposi/ Badga	<ol style="list-style-type: none"> <li>1. Though the site is rocky, good natural plant growth vis observed;</li> <li>2. Kendu &amp; Bamboo are planted around the boundary;</li> <li>3. It is reported that bamboo has been subject to theft by the locals;</li> <li>4. Local people dig and collect boulders from the hill for constructing their house;</li> <li>5. For the plantation purpose of the bald hill, required volume of soil was collected from outside as the area is totally rocky;</li> <li>6. Due to plantation Bald hill looks like a covered hill and many natural species have come up by this time.</li> </ol>
Block Plantation/ Bangiriposi/ Sirsa/ Sirsa	<ol style="list-style-type: none"> <li>1. The site is having full grown Acacia trees with good Canopy cover;</li> <li>2. Plain Terrain found suitable such growth of Acacia and other species.</li> </ol>
Block Plantation/ Deuli/ Suleipada/ Baghada	<ol style="list-style-type: none"> <li>1. The site is located in Suliapada RF;</li> <li>2. The site is heavily damaged due to elephant movement;</li> <li>3. No fuel wood collection has been possible in the site due to elephant;</li> <li>4. Local VSS is actively involved in the protection of the forest area;</li> <li>5. The installed pillars have been damaged due to elephant movement.</li> </ol>



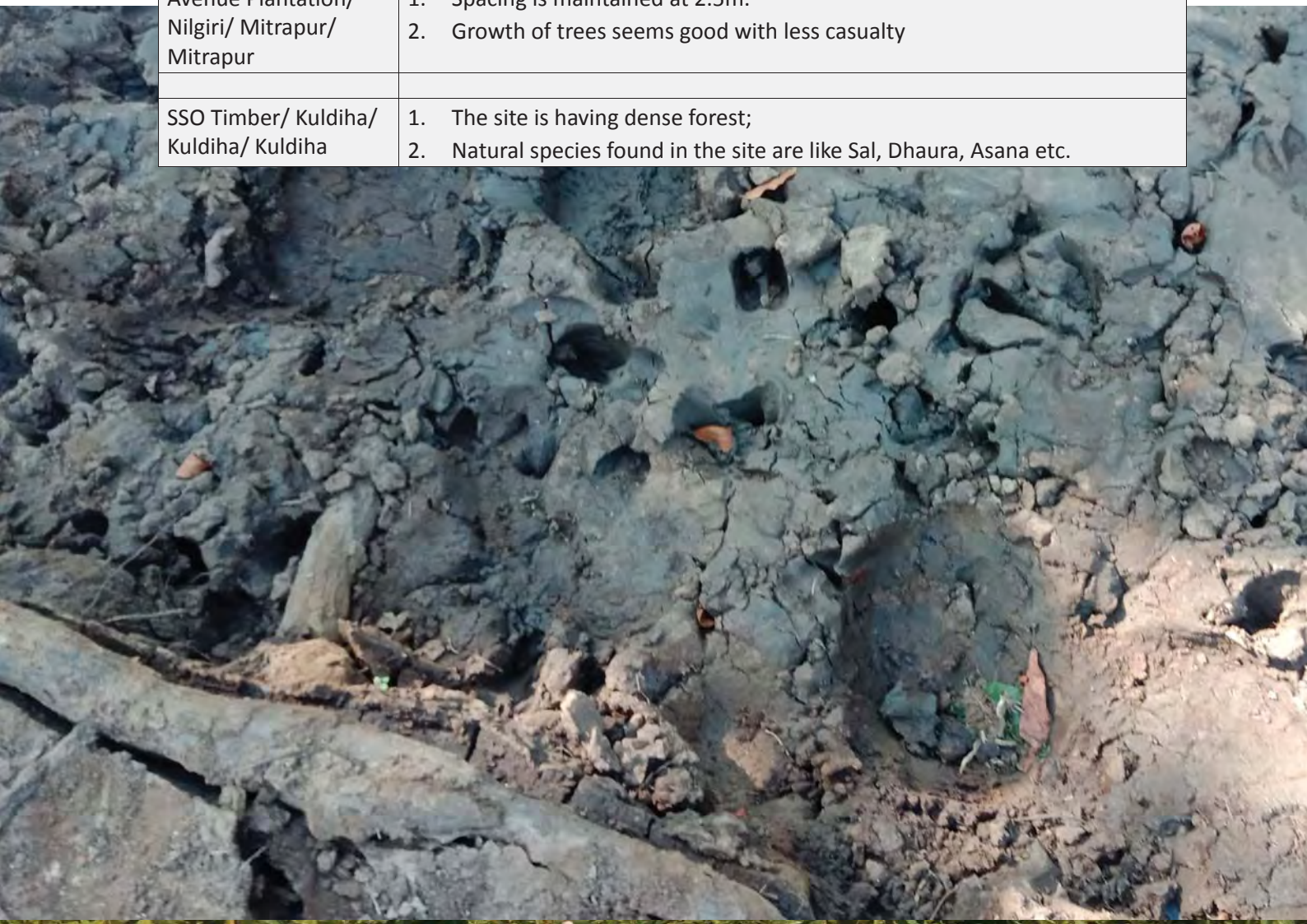


**Forest Circle:** Baripada

**Forest Division:** Balasore

**Table 4.18: Observations; Balasore FD**

Type of Assets	Observations
Block Plantation / Jaleswar/ Bardia/ Sukhjodi	<ol style="list-style-type: none"> <li>1. The site is having dense vegetation and well growth of Acacia is observed;</li> <li>2. In plantation, spacing of 2.5m is maintained;</li> <li>3. Growth of teak in other patches is very less.</li> </ol>
Block Plantation / Jaleswar/ Bardia/ Kendukunta	<ol style="list-style-type: none"> <li>1. The site is having dense forest cover;</li> <li>2. High natural regeneration observed;</li> <li>3. Natural species observed are like Sal, Kendu, Chara etc.</li> <li>4. Some patches of land in the site found encroached by the locals;</li> </ol>
Block Plantation / Nilgiri/ Sajanagarh/ Matiali	<ol style="list-style-type: none"> <li>1. Growth of teak observed to be comparatively less;</li> <li>2. Some patches found encroached by the locals;</li> </ol>
Block Plantation / Kuldiha/ Panchalingeswar/ Panchalingeswar	<ol style="list-style-type: none"> <li>1. Regeneration of some of the species is observed high in the site, but growth has been comparatively less;</li> </ol>
Avenue Plantation/ Nilgiri/ Mitrapur/ Mitrapur	<ol style="list-style-type: none"> <li>1. Spacing is maintained at 2.5m.</li> <li>2. Growth of trees seems good with less casualty</li> </ol>
SSO Timber/ Kuldiha/ Kuldiha/ Kuldiha	<ol style="list-style-type: none"> <li>1. The site is having dense forest;</li> <li>2. Natural species found in the site are like Sal, Dhaura, Asana etc.</li> </ol>



## 4.16. Infrastructural Facilities:

**Table 4.19: Usability of Road, Culvert & Causeway**

Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Special Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - Good, Average, Poor
1	Causeway/ Keonjhar WL/ Hadagarh/ Kathakata/ Pitana	<ul style="list-style-type: none"> <li>The causeway was created inside the sanctuary.</li> <li>It helps to gives way to water channel which helps to protect road to washout.</li> </ul>	<ul style="list-style-type: none"> <li>Causeway protects the road and it helps smooth movement of the staff in all season.</li> </ul>	8	High
2	Culvert/ Keonjhar WL/ Hadagarh/ Kathakata/ Pitana	<ul style="list-style-type: none"> <li>Culvert has constructed for smooth flow of water</li> <li>Easily transporting vehicle can entry to transporting seedlings from nursery in rain season</li> </ul>	<ul style="list-style-type: none"> <li>It helps the people to pass over the stream.</li> </ul>	9	High
3	Causeway/ Keonjhar WL/ Brahmanipal/ Daitari/ Talapada	<ul style="list-style-type: none"> <li>With the objective of diversion of surface runoff and to protect damage of the existing morum road, the causeway is created.</li> </ul>	<ul style="list-style-type: none"> <li>Easy accessibility to the forest even during rainy season</li> </ul>	8	High
5	Forest Road/ Rairangapur/ Bisoi/ Talabandha/ Talabandha	<ul style="list-style-type: none"> <li>Murom was led down on the road to make it moveable.</li> <li>The road has good connectivity to water body from anti-poaching centre.</li> </ul>	<ul style="list-style-type: none"> <li>Easy accessibility to the forest even during rainy season</li> </ul>	7	Medium
6	Causeway/ Rairangapur/ Bisoi/ Talabandha/ Talabandha	<ul style="list-style-type: none"> <li>It helps to prevent soil erosion.</li> <li>Due to this causeway forest department is having mobility in all seasons and also causeway protects the road at the time of rainy season</li> </ul>	<ul style="list-style-type: none"> <li>Causeway protects the road and it helps smooth motorable.</li> </ul>	9	High





Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Special Observations	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Evaluators assessment on the quality of the asset - Good, Average, Poor
9	Forest Road/ Karanjia/ Thakurmunda/ Keshdiha/ Mandalijhari	<ul style="list-style-type: none"> <li>Maintained in all APOs.</li> <li>The road connects to upper Barakamuda. The only way to go inside the core.</li> <li>Used for patrolling.</li> </ul>	<ul style="list-style-type: none"> <li>Easy accessibility to the forest in all seasons.</li> </ul>	8	High
10	Causeway/ STR/ Chahala/ Chahala/ Chahala	<ul style="list-style-type: none"> <li>Renovation of causeway is going on.</li> </ul>	<ul style="list-style-type: none"> <li>Causeway protects the road and it helps smooth motorable movement.</li> </ul>	9	High
11	Forest Road/ STR/ Chahala/ Chahala/ Chahala	<ul style="list-style-type: none"> <li>Half of the road i.e. about 6 km have been repaired under CAMPA and rest 6 km is newly constructed under CAMPA which connects to a beat house</li> </ul>	<ul style="list-style-type: none"> <li>It helps the department people to move within the forest in all seasons.</li> </ul>	7	Medium
12	Forest Road/ STR/ Jenabil/ Jenabil/ Jenabil	<ul style="list-style-type: none"> <li>Used by forest staff at the time of their mobility.</li> </ul>	<ul style="list-style-type: none"> <li>It helps for forest department officials in proper supervision implementation of forest activities.</li> <li>Patrolling made easy for the Departmental staff.</li> </ul>	8	High
13	Causeway/ STR/ Jenabil/ Gurundia/ Hatighara	<ul style="list-style-type: none"> <li>The causeway was created inside the Simlipal Tiger Reserve.</li> <li>It helps to give way to water channel which helps to protect road to washout.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this causeway forest department doing their mobility in all season and it also protect the road getting damaged due to heavy flow of rain water.</li> </ul>	8	High
14	Causeway/ Balasore WL/ Kuldiha/ Panchaligeswar/ Thenda	<ul style="list-style-type: none"> <li>Inside Sanctuary which give way for water movement</li> </ul>	<ul style="list-style-type: none"> <li>Due to this causeway forest department doing their mobility in all season and it also protect the road getting damaged due to heavy flow of rain water.</li> </ul>	9	High
15	Forest Road/ Balasore WL/ Kuldiha/ Kuldiha/ Kuldiha-II	<ul style="list-style-type: none"> <li>Used by local people and forest department</li> <li>The road is being repaired regularly after the rainy season.</li> </ul>	<ul style="list-style-type: none"> <li>All weather road and regularly used by inhabitants and departmental staff.</li> <li>Better communication facilities promoted for forest dwellers and department staff.</li> </ul>	9	High



Table 4.20: Usability of Building

Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Quality
1	Forester Residence cum Office/ Keonjhar WL/ Hadagarh/ Kathakata/ Kathakata	<ul style="list-style-type: none"> <li>6 anti-poaching squad, 1 Forest guard and 1 forester</li> </ul>	<ul style="list-style-type: none"> <li>Promoted better living standard which in turn helped him in smooth office functioning.</li> </ul>	9	High
2	Forest Guard Quarter/ Keonjhar WL/ Hadagarh/ Kathakata/ Pitana	<ul style="list-style-type: none"> <li>There is no trench around the F.G quarter. Elephant menace is high. 10 people stay including 1 forest guard</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Helped timely availability of forest field personnels.</li> </ul>	8	High
3	Range Office/ Keonjhar WL/ Hadagarh/ Hadagarh/ Hadagarh	<ul style="list-style-type: none"> <li>Well maintained. Neat office</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help in timely execution of field activity supervision.</li> </ul>	8	High
4	Ranger Residence/ Keonjhar WL/ Hadagarh/ Hadagarh/ Hadagarh	<ul style="list-style-type: none"> <li>Well maintained. Near the office</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help in timely execution of field activity supervision.</li> </ul>	8	High
5	Range Office/ Keonjhar WL/ Brahmanipal/ Daitari/ Talapada	<ul style="list-style-type: none"> <li>Well maintained. Neat office</li> </ul>	<ul style="list-style-type: none"> <li>A well organised office helps in proper and smooth functioning of tasks</li> </ul>	9	High
6	Barrack/ Keonjhar WL/ Brahmanipal/ Daitari/ Talapada	<ul style="list-style-type: none"> <li>Near range office. Well maintained.</li> <li>Used as residence of staff like Para staff, elephant tracker, night patrolling staff</li> </ul>	<ul style="list-style-type: none"> <li>Help in Ensuring ready availability of staff to attend an emergency.</li> </ul>	9	High
8	Malkhana/ Keonjhar WL/ Brahmanipal/ Daitari/ Talapada	<ul style="list-style-type: none"> <li>Used to store seized goods</li> </ul>	<ul style="list-style-type: none"> <li>Availability of space to keep the seized items safely under supervision of forest officials.</li> </ul>	8	High
10	Forest Guard Quarter/ Keonjhar WL/ Anandapur/ Ramchandrapur/ Patilo	<ul style="list-style-type: none"> <li>Fencing by rock. Bamboo gate</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard and helps timely implementation of forest activities.</li> </ul>	9	High
11	Barrack/ Keonjhar WL/ Anandapur/ Gayalamunda/ Gayalamunda	<ul style="list-style-type: none"> <li>2 storeyed building. 5 antipoaching squad stay.</li> </ul>	<ul style="list-style-type: none"> <li>Helps in quick response of the staffs to an emergency</li> </ul>	9	High





Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Observations	Impact	Score (Low, > or = 3, Medium > 3 to 7, High > 7 to 10)	Quality
12	Forest Guard Quarter/ Keonjhar WL/ Brahmanipal/ Brahmanipal/ Brahmanipal	<ul style="list-style-type: none"> <li>Family stays</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	8	High
13	Nursery shed/ Keonjhar WL/ Brahmanipal/ Daitari/ Talapada	<ul style="list-style-type: none"> <li>A labour shed and store room was available</li> </ul>	<ul style="list-style-type: none"> <li>Space available for proper stock of planting materials and there by check wastage.</li> </ul>	8	High
14	Forest Guard Quarter/ Rairangapur/ Bisoi/ Talabandha/ Talabandha	<ul style="list-style-type: none"> <li>There is no electricity and tap water</li> </ul>	<ul style="list-style-type: none"> <li>Help timely availability of forest field personnels.</li> </ul>	7	Medium
15	Forest Guard Quarter/ Rairangapur/ Bisoi/ Talabandha/ Talabandha	<ul style="list-style-type: none"> <li>There is no electricity and tap water</li> </ul>	<ul style="list-style-type: none"> <li>Help timely availability of forest field personnels.</li> </ul>	7	Medium
16	Range Office/ Rairangapur/ Rairangapur/ Badampat/ Badampat	<ul style="list-style-type: none"> <li>Well maintained. Neat office</li> </ul>	<ul style="list-style-type: none"> <li>A well organised office in proper and smooth functioning of forest activity.</li> </ul>	8	High
17	Forest Guard Quarter/ Rairangapur/ Rairangapur/ Badampat/ Badampat	<ul style="list-style-type: none"> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	8	High
18	Range Office/ Rairangapur/ Rairangapur/ Rairangapur/ Rairangapur	<ul style="list-style-type: none"> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>A well organised office helps in proper and smooth functioning of tasks</li> </ul>	9	High
19	Forest Guard Quarter/ Rairangapur/ Rairangapur/ Badamtolia/ Bijatola	<ul style="list-style-type: none"> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	8	High
20	Forester Residence cum Office/ Rairangapur/ Rairangapur/ Badamtolia/ Bijatola	<ul style="list-style-type: none"> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Promoted a better living standard which in turn helps in smooth office functions.</li> </ul>	9	High



Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
21	Malkhana/ Rairangapur/ Rairangapur/ Badamtolia/ Bijatola	<ul style="list-style-type: none"> <li>Used to store seized goods</li> </ul>	<ul style="list-style-type: none"> <li>Helps to keep the seized items safely under supervision of forest officials.</li> </ul>	9	High
22	Range Office/ Karanjia/ Thakurmunda/ Thakurmunda/ Thakurmunda	<ul style="list-style-type: none"> <li>Well Maintained</li> </ul>	<ul style="list-style-type: none"> <li>A well organised office helps in proper and smooth functioning of tasks</li> </ul>	9	High
23	Barrack/ Karanjia/ Thakurmunda/ Thakurmunda/ Thakurmunda	<ul style="list-style-type: none"> <li>Well Maintained.</li> <li>Used as residence of staff like Para staff, elephant tracker, night patrolling staff</li> </ul>	<ul style="list-style-type: none"> <li>Helps in fast response of the staffs to an emergency</li> <li>Facilitated timely patrolling.</li> </ul>	8	High
24	Forester Residence cum Office/ Karanjia/ Karanjia/ Rarua/ Raura	<ul style="list-style-type: none"> <li>Near to a village inside forest compound. @014-15 working</li> </ul>	<ul style="list-style-type: none"> <li>Promoted a better living standard which in turn helps in smooth office functions.</li> </ul>	8	High
25	Forest Guard Quarter/ Karanjia/ Karanjia/ Singhada/ Ghosoda	<ul style="list-style-type: none"> <li>Family stays</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	8	High
26	Forester Residence cum Office/ Karanjia / Karanjia/ Singhada/ Ghosoda	<ul style="list-style-type: none"> <li>Well Maintained</li> </ul>	<ul style="list-style-type: none"> <li>Promoted a better living standard which in turn helps in smooth office functions.</li> </ul>	8	High
27	Forest Guard Quarter/ Karanjia/ Dudhiani/ Tangabila/ Tangabila	<ul style="list-style-type: none"> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	8	High
28	Forest Guard Quarter/ Karanjia/ Dudhiani/ Ranipat/ Kiajahari	<ul style="list-style-type: none"> <li>Well Maintained</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	8	High
29	Range Office/ Karanjia/ Dudhiani/ Tato/ Tato	<ul style="list-style-type: none"> <li>Well Maintained</li> </ul>	<ul style="list-style-type: none"> <li>A well organised office helps in proper and smooth functioning of tasks</li> </ul>	8	High
30	Forester Residence cum Office/ STR/ Chahala/ Bareipani/ Bareipani	<ul style="list-style-type: none"> <li>Not very well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Promoted a better living standard which in turn helps in smooth office functions.</li> </ul>	8	Medium





Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Observations	Impact	Score (Low, > or = 3, Medium > 3 to 7, High > 7 to 10)	Quality
31	Forest Guard Quarter/ STR/ Chahala/ Chahala/ Kar Kachia	<ul style="list-style-type: none"> <li>6 PA along with 1 guard stay</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	8	Medium
32	Ranger Residence/ STR/ Chahala/ Chahala/ Chahala	<ul style="list-style-type: none"> <li>Well Maintained</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> </ul>	8	High
33	Forester Residence cum Office/ STR/ Upper Barakamuda/ Kandhadhenu/ Kandhadhenu	<ul style="list-style-type: none"> <li>The section office is constructed more than the estimate for helping labours to stay while they work</li> </ul>	<ul style="list-style-type: none"> <li>Promoted a better living standard which in turn helps in smooth office functions.</li> </ul>	8	Medium
34	Forest Guard Quarter/ STR/ Upper Barakamuda/ Upper Barakamuda/ Meghasani	<ul style="list-style-type: none"> <li>The section office is constructed more than the estimate for helping labours to stay while they work</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	8	Low
35	Range Office/ STR/ Upper Barakamuda/ Upper Barakamuda/ Upper Barakamuda	<ul style="list-style-type: none"> <li>The range office was destroyed by Maoist in the year 2009-10. After that it was renovated under CAMPA 2010-11</li> </ul>	<ul style="list-style-type: none"> <li>A well organised office helps in proper and smooth functioning of tasks</li> </ul>	8	Medium
36	Barrack/ STR/ Jenabil/ Gurundia/ Hatighara- I	<ul style="list-style-type: none"> <li>There is no electricity and tap water.</li> <li>Used as residence of staff like Para staff, elephant tracker, night patrolling staff</li> </ul>	<ul style="list-style-type: none"> <li>Helps in fast response of the staffs to an emergency</li> </ul>	9	High
37	Malkhana/ STR/ Jenabil/ Gurundia/ Hatighara- I	<ul style="list-style-type: none"> <li>Used to store seized goods</li> </ul>	<ul style="list-style-type: none"> <li>Helps to keep the seized items safely under supervision of forest officials.</li> </ul>	9	High
38	Officer Camp/ STR/ Jenabil/ Jenabil/ Jenabil	<ul style="list-style-type: none"> <li>There is no electricity and tap water</li> </ul>	<ul style="list-style-type: none"> <li>Helps in fast response of the staffs to an emergency</li> </ul>	9	High
39	Forest Guard Quarter/ STR/ Jenabil/ Jenabil/ Kulipal	<ul style="list-style-type: none"> <li>There is no electricity and tap water. However, Solar is available</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	9	High

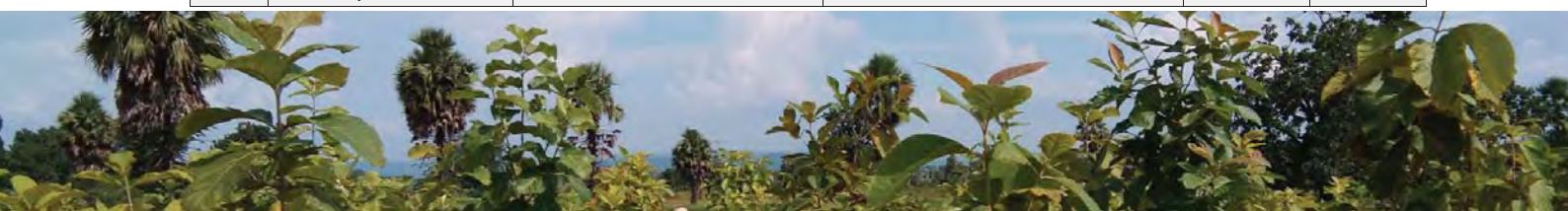


Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Quality
40	Anti-poaching Camp/ STR/ Jenabil/ Jenabil/ Son pokhari-I	<ul style="list-style-type: none"> <li>6 people stay. One floor building. Near the stream. Well maintained. The Camp is constructed in Udala area</li> </ul>	<ul style="list-style-type: none"> <li>Helps in fast response of the staffs to an emergency</li> </ul>	8	High
41	Forest Guard Quarter/ Baripada/ Dukura/ Tadaki/ Chandanchaturi	<ul style="list-style-type: none"> <li>Water facility is provided this year</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	8	Medium
42	Forester Residence cum Office/ Baripada/ Dukura/ Digdiga/ Sanakeraka	<ul style="list-style-type: none"> <li>Estimated cost 6,50,000</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> </ul>	8	Medium
43	Range Office/ Baripada/ Dukura/ Tadaki/ Dukura	<ul style="list-style-type: none"> <li>Well Maintained</li> </ul>	<ul style="list-style-type: none"> <li>A well organised office helps in proper and smooth functioning of tasks</li> </ul>	9	High
44	Forester Residence cum Office/ Baripada/ Bangiriposi/ Badagaan/ Badagaan	<ul style="list-style-type: none"> <li>No permanent electricity connection. Forester stays in there</li> </ul>	<ul style="list-style-type: none"> <li>Promoted a better living standard which in turn helps in smooth office functions.</li> </ul>	8	Medium
45	Ranger Residence/ Baripada/ Deuli/ Deuli/ Deuli	<ul style="list-style-type: none"> <li>Well Maintained</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> </ul>	98	High
46	Range Office/ Baripada/ Bangiriposi/ Badagaan/ Bangiriposi	<ul style="list-style-type: none"> <li>Well Maintained</li> </ul>	<ul style="list-style-type: none"> <li>A well organised office helps in proper and smooth functioning of tasks</li> </ul>	9	High
47	Ranger Residence/ Baripada/ Bangiriposi/ Badagaan/ Bangiriposi	<ul style="list-style-type: none"> <li>Well Maintained</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> </ul>	8	High
48	Forest Guard Quarter/ Baripada/ Bangiriposi/ Sirsa/ Inka	<ul style="list-style-type: none"> <li>Tube well &amp; Boundary wall are constructed under CAMPA fund 2016-17</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	8	High
49	Forester Residence cum Office/ Balasore WL/ Jaleswar/ Baradiha/ Sukhijhudi	<ul style="list-style-type: none"> <li>No permanent electricity connection. Forester stays in there</li> </ul>	<ul style="list-style-type: none"> <li>Promoted a better living standard which in turn helps in smooth office functions.</li> </ul>	8	High





Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
50	Forest Guard Quarter/ Balasore WL/ Jaleswar/ Udaypur/ Khadibil	<ul style="list-style-type: none"> <li>Barbed wire fencing is available</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	8	High
51	Barrack/ Balasore WL/ Jaleswar/ Jaleswar/ Jaleswar	<ul style="list-style-type: none"> <li>Two storeyed building, Para staff &amp; other squad stays here.</li> <li>Used as residence of staff like Para staff, elephant tracker, night patrolling staff</li> <li>Used as residence of staff like Para staff, elephant tracker, night patrolling staff</li> </ul>	<ul style="list-style-type: none"> <li>Helps in fast response of the staffs to an emergency</li> </ul>	8	High
52	Range Office/ Balasore WL/ Jaleswar/ Jaleswar/ Jaleswar	<ul style="list-style-type: none"> <li>Well Maintained</li> </ul>	<ul style="list-style-type: none"> <li>A well organised office helps in proper and smooth functioning of tasks</li> </ul>	9	High
53	Forest Guard Quarter/ Balasore WL/ Jaleswar/ Jaleswar/ Jaleswar	<ul style="list-style-type: none"> <li>Well maintained. Forest guard stays. Permanent electricity is not available</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> </ul>	9	High
54	Ranger Residence/ Balasore WL/ Jaleswar/ Jaleswar/ Jaleswar	<ul style="list-style-type: none"> <li>Well Maintained. Near to the range office</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> </ul>	9	High
55	Forester Residence cum Office/ Balasore WL/ Nilgiri/ Nilgiri/ Nilgiri	<ul style="list-style-type: none"> <li>Family is staying there</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> </ul>	9	High
56	Barrack/ Balasore WL/ Jaleswar/ Jaleswar/ Jaleswar	<ul style="list-style-type: none"> <li>Near range office. Well maintained.</li> <li>Used as residence of staff like Para staff, elephant tracker, night patrolling staff</li> </ul>	<ul style="list-style-type: none"> <li>Helps in fast response of the staffs to an emergency</li> </ul>	8	High
57	Range Office/ Balasore WL/ Nilgiri/ Nilgiri/ Nilgiri	<ul style="list-style-type: none"> <li>Slightly deviated from actual design</li> </ul>	<ul style="list-style-type: none"> <li>A well organised office helps in proper and smooth functioning of tasks</li> </ul>	8	High
58	Forest Guard Quarter/ Balasore WL/ Nilgiri/ Sajanagada/ Naranapur	<ul style="list-style-type: none"> <li>Tap water is not available</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	7	High



Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Quality
59	Forest Guard Quarter/ Balasore WL/ Kuldih/ Panchaligeswar/ Panchaligeswar	<ul style="list-style-type: none"> <li>Well maintained. Forest guard stays</li> </ul>	<ul style="list-style-type: none"> <li>Gives a better living standard</li> <li>Help timely availability of forest field personnels.</li> </ul>	9	High

Table 4.21: Usability of seizer yard and other wild life management

Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Type of current use & Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Quality
1	Salt lick/ Keonjhar WL/ Hadagarh/ Kathakata/ Pitanaui	<ul style="list-style-type: none"> <li>Many animals come to the salt lick.</li> <li>It is maintained by every year.</li> </ul>	<ul style="list-style-type: none"> <li>Salt lick helps in meeting the mineral supplements of animals</li> <li>No poaching activities are being noticed</li> </ul>	8	High
2	Watch tower/ Keonjhar WL/ Hadagarh/ Kathakata/ Kathakata	<ul style="list-style-type: none"> <li>The watch tower is made just at the sanctuary entrance gate to keep an eye on the poachers and other visitors.</li> </ul>	<ul style="list-style-type: none"> <li>Poaching cases are minimised after construction of the watch tower</li> </ul>	9	High
3	Seizure Yard/ Keonjhar WL/ Brahmanipal/ Brahmanipal/ Brahmanipal	<ul style="list-style-type: none"> <li>It is a prominent place to keep the seized vehicle &amp; other stuffs</li> </ul>	<ul style="list-style-type: none"> <li>Construction of the Seizure yard helps to keep the seized item safely.</li> </ul>	8	High
4	Solar fencing/ Rairangapur/ Badampahar/ Hatabadra/ Dubulabada	<ul style="list-style-type: none"> <li>The fence was by elephant</li> <li>It is not in a working condition</li> </ul>	<ul style="list-style-type: none"> <li>Used to prevent Jharkhand elephants to come into main area.</li> <li>Reduced human animal conflict</li> <li>Not much elephants are being seen at present time as they have been diverted through solar fencing</li> </ul>	3	Low





Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Type of current use & Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
5	Watch tower/ Rairangapur/ Badampahar/ Hatabadra/ Dubulabada	<ul style="list-style-type: none"> <li>On the border of Jharkhand. Not much elephants are being seen at present time as they have been diverted through solar fencing. Very near to water body created</li> </ul>	<ul style="list-style-type: none"> <li>It helps to keep an eye on the movement of elephant and other activities.</li> <li>It helped in elephant and other animals tracking and also taking appropriate measures.</li> </ul>	9	High
6	Earthen Bund/ Karanjia/ Thakurmunda/ Keshdiha/ Mituari	<ul style="list-style-type: none"> <li>The structure helps in ground water recharge as it retains the rain water from runoff</li> </ul>	<ul style="list-style-type: none"> <li>Ground water of the site has increased.</li> </ul>	8	High
7	Earthen Graded Bund/ Karanjia/ Dudhiani/ Ranipat/ Ranipat	<ul style="list-style-type: none"> <li>The bund along with the pit will help the water retain in the pit and the bund will check the water flow.</li> </ul>	<ul style="list-style-type: none"> <li>It helped in ground water recharge &amp; high land recharge</li> </ul>	8	High
8	Salt lick/ STR/ Chahala/ Chahala/ Chahala	<ul style="list-style-type: none"> <li>Many animals come to the salt lick.</li> </ul>	<ul style="list-style-type: none"> <li>Salt lick caters to the mineral supplements of animals</li> </ul>	8	High
9	Salt Lick/ STR/ Chahala/ Chahala/ Chahala	<ul style="list-style-type: none"> <li>It is one of the best licks of Chahala.</li> <li>Around 300-400 animals come every day to salt lick</li> </ul>	<ul style="list-style-type: none"> <li>Wild animal got the minerals and salt as per their need.</li> </ul>	8	High
10	Elephant Trench/ STR/ Chahala/ Chahala/ Chahala	<ul style="list-style-type: none"> <li>Protects range office, FRH and other main building of the range from elephant menace</li> </ul>	<ul style="list-style-type: none"> <li>It minimized the risk of human animal conflict.</li> </ul>	8	High
11	Seed Plot/ STR/ Jenabil/ Gurundia/ Hatighara	<ul style="list-style-type: none"> <li>It is done for preserving different variety of grasses and act as a seed nursey for plantation of other meadows.</li> <li>The grasses are of Indigenous species. Species present are Cynadino dactylon, Themda lacr, Setaria pumila, Ischa</li> </ul>	<ul style="list-style-type: none"> <li>Ready availability of different varieties of grass seeds for promotion of meadows.</li> </ul>	8	High



Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Type of current use & Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
12	Elephant Trench/ STR/ Jenabil/ Gurundia/ Hatighara	<ul style="list-style-type: none"> <li>It is done to prevent elephants to enter into the range office, quarter &amp; barrack</li> </ul>	<ul style="list-style-type: none"> <li>Helped to reduce the risk of human animal conflict</li> </ul>	8	High
13	Elephant Trench/ STR/ Upper Barakamuda/ upper Barakamuda/ Mathughar	<ul style="list-style-type: none"> <li>It was a well-maintained trench.</li> <li>Well maintained, stone packed trench around the watch tower</li> </ul>	<ul style="list-style-type: none"> <li>Entry of elephant to the habitation area restricted checked.</li> <li>Reduced the risk of human animal conflict.</li> </ul>	8	High
14	Watch tower/ STR/ Upper Barakamuda/ upper Barakamuda/ Mathughar	<ul style="list-style-type: none"> <li>There are total 6 staff staying there to keep an eye at different activities i.e. protection, poaching etc.</li> </ul>	<ul style="list-style-type: none"> <li>Helped in quick communication and decision making.</li> </ul>	9	High
15	Salt lick/ STR/ Upper Barakamuda/ Upper Barakamuda/ Upper Barakamuda	<ul style="list-style-type: none"> <li>It is the biggest salt lick of Simlipal. Around 200-300 deers, barking deers come for licking salt every day.</li> <li>Elephants, Bison also come often.</li> </ul>	<ul style="list-style-type: none"> <li>Salt lick helps cattering the mineral supplements of wild animals.</li> </ul>	10	High
16	Seizure Yard/ Balasore WL/ Nilgiri/ Nilgiri/ Nilgiri	<ul style="list-style-type: none"> <li>All the seized wood log other items were stored within the yard.</li> </ul>	<ul style="list-style-type: none"> <li>Helped to keep the seized items safely.</li> </ul>	8	High
17	Solar Fencing/ Balasore WL/ Kuldiha/ Panchaligeswar/ Thenda	<ul style="list-style-type: none"> <li>The solar fencing is not in working condition.</li> <li>Some parts of the fence have broken.</li> </ul>	<ul style="list-style-type: none"> <li>As the fencing is not in working condition so no such impact has observed.</li> </ul>	2	Low
18	Anti-poaching Gate/ Balasore WL/ Kuldiha/ Kuldiha/ Kuldiha- II	<ul style="list-style-type: none"> <li>The gate was constructed to restrict the entry of tourist and other persons to enter in the forest area</li> </ul>	<ul style="list-style-type: none"> <li>Safety of the forest and wild animal Improved.</li> </ul>	8	High





Table 4.22: Usability of Water Body and other SMC structures

Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Type of Current use & Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Quality
1	Water Body/ Keonjhar WL/ Anandapur/ Ramchandrapur/ Baranga	<ul style="list-style-type: none"> <li>Used by wild animals like Bear, Deer, Rabbit, Porcupine, Fox, Hyena.</li> <li>Bank Slope, Sign board and steps were there in the water body.</li> <li>Water has available throughout the year</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	8	High
2	Water Body/ Keonjhar WL/ Brahmanipal/ Daitari/ Talapada	<ul style="list-style-type: none"> <li>Water body was constructed nearer to the forest.</li> <li>Used by wild animals like Bear, Barking Deer, Rabbit for drinking at night time.</li> <li>Among wild animal local people also used the water body for cleaning and bathing purpose.</li> </ul>	<ul style="list-style-type: none"> <li>Catered to the water requirement of wild animals and local people.</li> </ul>	6	Medium
3	Water Body/ Rairangapur/ Rairangapur/ Badamtolia/ Bijatola	<ul style="list-style-type: none"> <li>Water Body was constructed deep inside the forest.</li> <li>Elephant and other wild animals come for drinking and bathing.</li> <li>No community uses.</li> <li>Fruit bearing trees were planted but not present now</li> </ul>	<ul style="list-style-type: none"> <li>Met the water requirement of wild animals for drinking and bathing purposes.</li> </ul>	8	High
4	Water Body/ Rairangapur/ Bisoi/ Talabandha/ Talabandha	<ul style="list-style-type: none"> <li>It was created Inside Simlipal forest.</li> <li>Fruit bearing trees are planted around the water body.</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced accesses of wild animal to water for drinking purpose, even in summer season. Where water scarcity is observed in other areas.</li> </ul>	9	High



Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Type of Current use & Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
5	Water Body/ Rairangapur/ Badampahar/ Hatabadra/ Dubulabada	<ul style="list-style-type: none"> <li>Water is available throughout the year as it has a perennial source of water.</li> <li>Elephants, barking deer, bear use for drinking</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced accesses of wild animal to water for drinking purpose, even in summer season. Where water scarcity is observed in other areas.</li> </ul>	8	High
6	Water Body/ Rairangapur/ Badampahar/ Hatabadra/ Dubulabada	<ul style="list-style-type: none"> <li>Deep inside the forest. So has impact on wild animals.</li> <li>Elephant, bears, Deer, barking deer comes for drinking and bathing.</li> <li>Local villagers also used the water body for drinking and bating purpose.</li> <li>Water is available throughout the year.</li> <li>Fruit bearing trees are planted around the water body.</li> </ul>	<ul style="list-style-type: none"> <li>Met the water requirement of wild animals for drinking and bathing purposes.</li> </ul>	9	High
7	Water Body/ Karanjia/ Thakurmunda/ Keshdiha/ Mituari	<ul style="list-style-type: none"> <li>Deep inside the forest. So has impact on wild animals.</li> <li>Wild boar, barking deer comes for drinking and bathing.</li> <li>Water is available throughout the year as it has Perennial water source.</li> <li>Fruit bearing plants has planted around the water body.</li> </ul>	<ul style="list-style-type: none"> <li>Used for elephant bathing and drinking.</li> <li>Used by other wild animals for drinking water.</li> <li>Availability of water for drinking and bathing of wild animals round the year.</li> </ul>	8	High
8	Water Body/ Karanjia/ Karanjia/ Singhada/ Ghosoda	<ul style="list-style-type: none"> <li>Migrated elephants stay here. Rabbit, fox use the water body for Drinking. Mainly constructed for elephants. Seasonal source of water. No community use. No fruit bearing trees</li> </ul>	<ul style="list-style-type: none"> <li>Used for elephant bathing and drinking.</li> <li>Used by other wild animals for drinking water.</li> </ul>	8	High





Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Type of Current use & Observations	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Quality
9	LBCD/ Karanjia/ Dudhiani/ Ranipat/ Ranipat	<ul style="list-style-type: none"> <li>Checks water flow and soil conservation</li> </ul>	<ul style="list-style-type: none"> <li>Erosion of top soil checked after construction of Lose bolder check dam.</li> </ul>	8	High
10	WHS/ STR/ Upper Barakamuda/ Patbil/ Tinadita	<ul style="list-style-type: none"> <li>The WHS was constructed inside the water body to conserve the water and maintain the flow of water.</li> </ul>	<ul style="list-style-type: none"> <li>Water and Soil conservation has increased in the site.</li> </ul>	9	High
11	Water Body/ STR/ Upper Barakamuda/ Patbil/ Tinadita	<ul style="list-style-type: none"> <li>The water body was natural. Only one side of embankment is done. Renovation is done</li> </ul>	<ul style="list-style-type: none"> <li>Cattered to the water needs.</li> </ul>	8	High
12	Water Body/ Baripada/ Dukura/ Digdiga/ Sanakeraka	<ul style="list-style-type: none"> <li>used for fishing, agriculture &amp; community use,</li> <li>Elephant from Simlipal National park used to come here for bathing &amp; drinking purpose, Other animals like Deer, Sambar, Wild boar also come here.</li> <li>Water is available throughout the season.</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year helped in moisture conservation.</li> <li>Livelihood promotion through fishing activity.</li> </ul>	8	High
13	Check Dam/ Balasore WL/ Kuldiha/ Kuldiha/ Kuldiha-II	<ul style="list-style-type: none"> <li>The check Dam is broken due to heavy rain.</li> </ul>	<ul style="list-style-type: none"> <li>Currently the Check Dam is not in working condition as it was wrecked due to heavy rain.</li> </ul>	3	Low



Table 4.23: Usability of Sacred Grove

Sl. No	Type of Assets/ Division/ Range/ Section/ Beat	Special Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Quality
1	Scared Groove/ Keonjhar WL/ Anandapur/ Ramchandrapur/ Baranga	<ul style="list-style-type: none"> <li>It is done to motivate the people who were evicted from the encroached area.</li> <li>Currently 100-200 tribal families were worship there.</li> <li>Tube well, Compound wall, plantation and one worship structure has created in the site.</li> </ul>	<ul style="list-style-type: none"> <li>Increased awareness among people of forest fringe villagers on importance of forest and raising plantation.</li> </ul>	9	High
2	Scared Groove/ Karanjia/ Thakurmunda/ Keshdiha/ Mandalijhari	<ul style="list-style-type: none"> <li>All village member worship here. There are around 100 tribal families were worship in the site.</li> <li>Tube well, Compound wall, plantation and one worship structure has created in the site.</li> </ul>	<ul style="list-style-type: none"> <li>Developed aesthetic seance and improved motivation for planting trees among people.</li> </ul>	9	High
3	Scared Groove/ Karanjia/ Karanjia/ Singhada/ Ghosoda	<ul style="list-style-type: none"> <li>Every year 2-3 festival is conducted.</li> <li>200-300 Tribal people of Ghosda village perform their ritual in the scared grooves</li> </ul>	<ul style="list-style-type: none"> <li>Critical awareness among people on importance of forest and plants.</li> <li>Developed positive attitude of people for conservation and plantation of sacred groves with religion feelings.</li> </ul>	7	Medium
4	Scared Groove/ Karanjia/ Dudhiani/ Tangabila/ Tangabila	<ul style="list-style-type: none"> <li>62 ST families depend on the scared groove.</li> <li>All festivals are observed here.</li> <li>Bahada, Neem, Bela, Pia sala, Acacia were planted in the site.</li> </ul>	<ul style="list-style-type: none"> <li>Helped to create awareness among people on importance of forest and plants and their contribution to the environment.</li> </ul>	9	High

Table 4.24: Types of Plants Planted under Different Plantation Activities

SN	Plant Species	ANR with GP	Avenue Plantation	Bald Hill Plantation	Block Plantation
1	Acacia auriculiformis	√	√	√	√
2	Amla	√		√	
3	Arjuna	√			
4	Asana			√	
5	Ata			√	
6	Babul			√	





SN	Plant Species	ANR with GP	Avenue Plantation	Bald Hill Plantation	Block Plantation
7	Badachakunda	√			√
8	Bamboo			√	
9	Banyan			√	
10	Barakoli				√
11	Bela				√
12	Cashew	√		√	
13	Chatiyani	√		√	
14	Eucalyptus				√
15	Gambhari	√			
16	Jamun	√			
17	Kadamba			1	
18	Karanja	√	√		
19	Kathabadam		√		
20	Krushnachuda		√	√	
21	Mahaneem	√		√	
22	Mangium	√		√	√
23	Neem			√	
24	Paladhua			√	
25	Peepal			√	
26	Radhachuda		√	√	
27	Sanachankunda	√		√	
28	Simaruba	√		√	√
29	Simili				√
30	Sirisa	√			√
31	Sisoo	√		√	
32	Teak	√			√

Table 4.25: Types of Plants Planted under Different Plantation Activities by FD

Forest Division	Plant Species	Type of Plantation			
		ANR with Gap	Avenue Plantation	Bald Hill Plantation	Block Plantation
Balasore	Badachakunda				√
	Barakoli				√
	Bela				√
	Kathabadam		√		
	Krushnachuda		√		
	Mangium				√
	Radhachuda		√		
	Simili				√
	Sirisa				√



Forest Division	Plant Species	Type of Plantation			
		ANR with Gap	Avenue Plantation	Bald Hill Plantation	Block Plantation
	Teak				√
<b>Baripada</b>	Amla	√		√	
	Arjuna	√			
	Asana			√	
	Badachakunda	√			
	Bamboo			√	
	Cashew			√	
	Chatiyani	√			
	Gambhari	√			
	Jamun	√			
	Mangium	√		√	√
	Neem			√	
	Sanachankunda	√			
	Simaruba	√		√	
	Sirisa	√			
	Sisoo	√		√	
	Teak	√			√
<b>Karanjia</b>	Acacia auriculiformis	√	√		√
	Karanja		√		
	Krushnachuda		√		
	Mangium	√			√
	Simaruba	√			
	Sisoo	√			
	Teak	√			
<b>Keonjhar WL</b>	Acacia auriculiformis	√		√	
	Arjuna	√			
	Ata			√	
	Babul			√	
	Banyan			√	
	Cashew	√			
	Chatiyani			√	
	Kadamba			√	
	Krushnachuda			√	
	Mahaneem			√	





Forest Division	Plant Species	Type of Plantation			
		ANR with Gap	Avenue Plantation	Bald Hill Plantation	Block Plantation
	Paladhua			√	
	Peepal			√	
	Radhachuda			√	
	Sanachankunda			√	
	Simaruba			√	
	Sisoo	√			
	Teak	√			√
<b>Rairangapur</b>	Amla	√			
	Karanja	√			
	Mahaneem	√			
	Mangium				√
	Simaruba	√			√
	Teak	√			√

#### 4.16 Key Findings

- In Block Plantation plant survival rate varies from 99.5 percent (Keonjhar WL) to 92.75 percent (Baripada). So, plant mortality rate varies between 0.5 percent (Keonjhar WL) to 7.25 percent (Baripada Forest Division).
- In Bald hill Plantation The survival rate of the plants under these categories found to be lowest in Baripada (98.13 percent) and highest in Keonjhar WL (99.0 percent).
- In the ANR with gap plantation Plant survival rate per ha. varies between 84.7 percent (Rairangpur) to 96.9 percent (Karanja). Accordingly, plant mortality rate varies between 3.1 percent (Karanja) to 15.3 percent (Rairangpur).
- In the Avenue plantation Plant mortality rate observed to be 7.0 percent in Balasore and 16.0 percent in Karanja.
- Canopy cover in block plantation is observed to be high among all the plantation categories (70.3 percent), followed by ANR with gap plantation (60.7 percent) and bald hill plantation (55.0 percent).
- Height and girth of the plants by forest divisions reflects that mean maximum height of the plants in plantation category is highest in Karanja (6.63 mt.) followed by Balasore (5.92 mt.) and lowest in Baripada (3.85 mt.)

#### 4.17 Suggestions

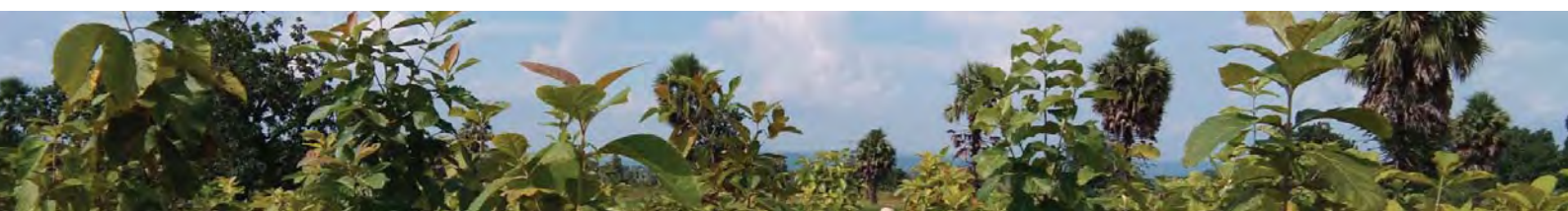
- Plantations done in the year 2009-10 are mostly mono-culture.
- SMC works were not done during the 1st phase of CAMPA during 2009-10.
- Presenting watch & ward and maintenance is given only upto 3 years after plantation.
- However for watch & ward and maintenance of the plantation site provisions may be made upto 10 years of plantation to ensure minimum casualty.
- Some of the plantation pillars are made up of Stone which are destroyed easily by wild animals and concrete pillars may be used.
- In some sites, sign boards are either not made or are broken which makes it difficult to identify the



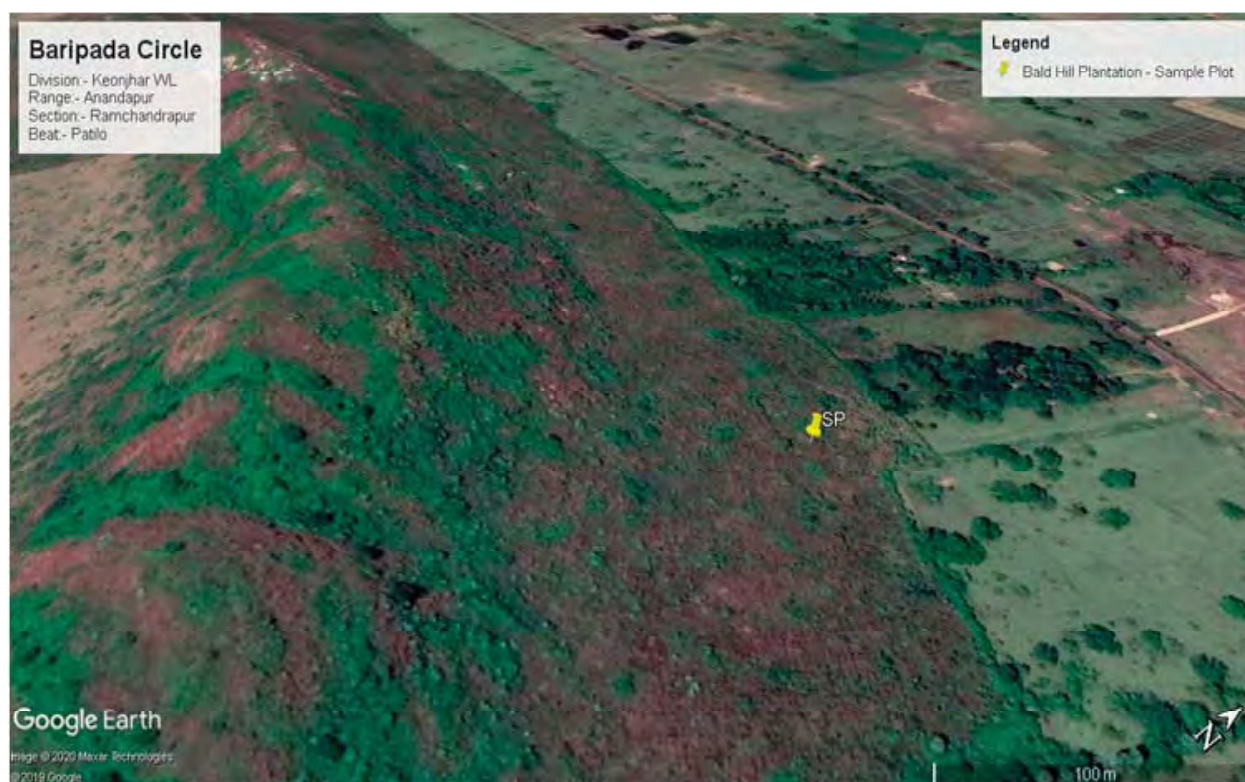
site. Thus it may be replaced.

- Survival percentage and Growth rate of plants under Block plantation is better as compared to ANR plantations
- Mixture of indigenous species must be done.
- Timber species are mostly preferred for plantation under CAMPA.
- A lot of encroached land have been converted into plantation site due to CAMPA intervention.
- Poly culture mode of plantation may be practiced in all plantation types so that the plantation patch has different canopy layers.
- Fruit bearing tree species may be planted along with other species as it will promote interest of the locals for protection and will also give some livelihood to them.
- Initiatives may be taken to include local VSSs for protection of all type of plantations.
- Provision for fencing may be made compulsory for all type of plantations.
- A lot of infrastructures have been made under CAMPA fund like Range offices, Quarters, Section offices, Beat House etc. These infrastructures help immensely for better implementation of forest activities.
- Permanent electricity and water connection have not been provided to most of the buildings. Thus electrification and water supply in such building may be made mandatory under CAMPA.
- Fund for renovation of the already existing buildings may be considered for the sustainability of the assets.
- Each meadow should have a watch tower near to it for watch the movement the poachers.

#### 4.18 Satellite Imagery of Sample plots in Baripada Circle















## CHAPTER - V







## 5. Evidence of CAMPA Implementation in Berhampur Circle

Berhampur forest circle comprises of seven forest divisions covering four administrative districts -Ganjam, Gajapati, Kandhamal and Boudh in Odisha. All forest divisions are territorial forest divisions and there is no wildlife division in the circle. Taking into account the scope of the study, in this chapter an attempt is made to evaluate the outcome performance of all the activities performed under CAMPA. In this process, the evaluation of core activities comprising of Plantation, silvicultural operations, subsidiary silvicultural operations, forest protection, wild life Management, Ama Jungle Yojana, promotion and maintenance of sacred groves etc are covered in Section-1 of this chapter. The evaluation of CAMPA-non-core activities are covered in second section. The outcome performance of all the CAMPA supported activities is analysed on the basis of primary data obtained from the sample sites visited by the study team. The sample sites consisting of all types of plantation and other than plantation activities are covered under three forest ranges. After finding out the pattern of implementation, actual availability and functioning of such assets are also verified by utilizing pre designed and pre tested assets specific instruments of data collection. In the course of plantation evaluation, proper measurement of sample plots and proper measurement of height, GBH/GCH and crown density is ensured so as to get reliable estimates of the sample data. The outcome performance of all the assets are assessed by interacting with forest officers at Division, Range, Section and Bit level. Division wise the list of sample ranges covered in the evaluation study is as per table 5.1 given below.

*Table 5.1: Division and Range wise sample coverage under Berhampur forest Circle*

Sl. No	Name of the Division	Name of the Sampled Range	Type of sampled out Plantation Sites
1	Ghumshar South Division	Aska Range	Block Plantation-Asuraipalli
			Baldhill Plantation - Gabanala
			ANR with GAP plantation -Kendupalli
		Badagada Range	Compensatory ANR with Gap plantation - Banjar
			ANR with Gap Plantation - S Gunduribadi
			Block Plantation - Lembakumba
2	Berhampur Division	Berhampur Range	SSO Bamboo - Ramnaguda
			ANR with Gap Plantation - Jillundi
		Khalikote Range	Avenue Plantation - Dumdum
			ANR without Gap Plantation - Tarasingi
		Dighapahandi Range	Management of Old Teak - Ghogada
			ANR with Gap Plantation - Gallery RF C/5
3	Berhampur Division	Berhampur Range	Block Plantation - Gallery RF C/5
			SSO Bamboo - Hathiguda South
		Khalikote Range	SSO Bamboo - Baniamari comp-2, patch-1, RF
			ANR with Gap Plantation - Ramaguda RF
			Management of Old Teak - Bhallery RF, Narayani
			ANR with Gap - Ranibar A, DPF-2



Sl. No	Name of the Division	Name of the Sampled Range	Type of sampled out Plantation Sites
4	Phulbani Division	Dighapahandi Range	Bald hill Plantation -Lalmenta
			Block Plantation - Bankeshwari watershed, Karandimala DPF, Batamahulapada, Biribadia
			Bald hill Plantation - Palaspur
		Phulbani Range	Block Plantation - Jhampi, Nagleju & Balisugri micro watershed
			ANR with Gap – Gumuguda RF
		G. Udayagri Range	ANR with Gap - Bakingia PRF near Gutuguda
			ANR with Gap - Bakingia PRF near Dakedi
			ANR with Gap - Pukulingia RF & KF
		Phiringia Range	SSO Bamboo – Krandibali
			ANR without GAP – Bakari
5	Boudh Division	Madhapur Range	ANR with Gap - Adenigarh
			SSO Bamboo - Baring
			SSO Timber - Kochida
		Boudh Range	Block Plantation – Devgarh
			ANR with Gap - Brahmanipati
		Purna Cuttack	Block Plantation - Sakasingha
6	Balliguda Division	Tumudibandha Range	Block Plantation - Naliguda
			ANR with Gap - Kotogarh
			SSO Bamboo - Gumpadar
		Baliguda Range	Block Plantation - Balliguda
			ANR with Gap - Bataguda
		Simanbadi Range	SSO Timber - Badabanga
			ANR with Gap - Budhaguda
			ANR without Gap (AJY) - Tillory
7	Parlakhemundi Division	Chandragiri Range	Block Plantation - Labarsingh
			SSO Bamboo - T. Gobindapur
		Devgiri Range	ANR without Gap (AJY) - Bidua
			ANR with Gap – Bidua - Bidua
		Mohendra Range	ANR with Gap - Narayanpur-2
			Avenue Plantation - Narayanpur-2
			ANR with Gap - Garabandha
			ANR without Gap - Lavaynagarh





## 5.1 Plantation Activities

AR Plantations: Artificial Regeneration (AR) plantation comprises of block plantation, bald hill plantation, compensatory afforestation, avenue and OWP plantation.

NR Plantation: ANR Plantation under CAMPFA is created in all forest divisions. On an average 1594.4 hectares of Gross Forest Area and 1550.5 hectares of net area per forest range is covered under CAMPFA implementation. Compared to all forest divisions under Berhampur circle, maximum net forest area to the extent of 1410.0 hectares per range in Baliguda division is covered under ANR plantation. Net area as percentage to gross area for ANR plantation is found to be more than 85 percent in all forest divisions and it is 100 percent in Ghumsur (South) forest division.

For examining the performance of different type of plantation activities performed under CAMPFA, 49 sample sites comprising of all types of plantation activities under CAMPFA were visited. Basing upon the size of the plantation, number of sample plots were decided to analyse the performance of plantation activities. In this process a total number 164 plots under different plantation categories were verified as mentioned in the following table. Taking into account all types of plantation sites, the average area of the plantation sites is found to be the highest at Baliguda division and lowest at Ghumsur (North) division.

Maintenance of delineated 4 hectares of plots are not maintained for any type of plantation. Such type of plots are maintained for ANR with gap, bald hills plantation, block plantation and management of old teak plantation. For SSO bamboo, such type of delineated plots is not maintained even in Berhampur forest division. For ANR with gap type of plantations, delineated 4 hectares plots are maintained under Ghumsur (North) forest division.

It is found that plantation journals are maintained by all the sample ranges under all forest divisions for undertaking new plantation activities. However, for ANR type of plantation activities and subsidiary silvicultural operations, plantation registers are maintained. Similarly, for ANR with gap plantation, plantation journal is not maintained by all of the forest ranges. It is found that 50 percent of the ranges under Ghumsur (North) forest division are not maintaining plantation journal.

Plantation maps are prepared for all types of plantations at Baliguda, Berhampur and Boudh divisions. Ghumsur (south) division maintains it for all plantation activities.

During interaction with forest officials, it is understood that without community involvement, micro plans can't be prepared,

As it can be observed from the following table, treatment maps are prepared by all the divisions only for ANR type of activities. For all types of plantation activities, plantation journals are maintained.

From table 5.2, it is further evident that treatment maps are found for ANR with gap, ANR without gap and management of old teak plantation.



Table-5.2: Field verification of Plantation Sites

Divisions	Type of Plantation	No of sites	No of Plots sampled out	No of plots sampled out per site	Average of Area of the Sites (Hectares)	% of Plantation sites having Plantation Journal	% of sites having plantation maps	No of sites having treatment Maps	% of sites maintaining Registers
Balliguda	ANR with GAP	3	10	3	58.0	100.0	100.0	3	
	ANR without Gap (AJY)	1	3	3	50.0	NA	100.0	1	
	Block Plantation	2	2	1	5.0	100.0	100.0		
	SSO Bamboo	1	5	5	800.0	NA	100.0		100.0
	SSO Timber	1	5	5	775.0	NA	100.0		100.0
Berhampur									
	ANR with GAP	3	8	6	100.0	100.0	100.0	3	
	Bald Hill Plantation	1	2	2	12.5	100.0	100.0		
	Block Plantation	1	3	3	50.0	100.0	100.0		
	Management of Old Teak	1	1	1	20.0	NA	100.0	1	100.0
Boudh	SSO Bamboo	1	2	2	30.0	NA	100.0		100.0
	ANR with GAP	3	13	4	88.5	100.0	100.0	3	
	Block Plantation	2	4	2	53.0	100.0	100.0		
	SSO Bamboo	1	5	5	100.0	0	100.0		100.0
Ghumshar South	SSO Timber	1	5	5	390.0	NA	100.0		100.0
	ANR with GAP	2	7	4	82.9	100.0	100.0	2	
	Bald Hill Plantation	1	2	2	20.0	100.0	100.0		
	Block Plantation	2	4	2	45.0	100.0	100.0		
	Compensatory ANR with Gap plantation	1	3	3	50.0	100.0	100.0	1	
	SSO Bamboo	1	5	5	304.0	0.0	0.0		100.0





Divisions	Type of Plantation	No of sites	No of Plots sampled out	No of plots sampled out per site	Average of Area of the Sites (Hectares)	% of Plantation sites having Plantation Journal	% of sites having plantation maps	No of sites having treatment Maps	% of sites maintaining Registers
Ghumsur North	ANR with GAP	2	6	3	50.0	66.7	50.0	2	
	ANR without Gap	1	5	5	150.0	0.0	100.0		
	Avenue Plantation	1	1	2		0.0	0.0		
	Block Plantation	1	4	4		100.0	100.0		
	Management of Old Teak	1	2	2	45.0	0.0	100.0	1	
	SSO Bamboo	1	5	5		0.0	0.0		100.0
Paralakhem-undi	ANR with GAP	3	8	3	81.3	100.0	100.0	3	
	ANR without Gap	2	8	8	150	0	100	0	100
	Avenue Plantation	1	1	1		NA	0.0		100.0
	Block Plantation	1	2	2	30.0	100.0	100.0		
	SSO Bamboo	1	5	5	200.0	0.0	0.0		100.0
Phulbani	ANR with GAP	2	18	9	147.2	100.0	100.0	2	
	ANR without Gap	1	8	8	112.5	NA	100.0		100.0
	Block Plantation	1	1	1	20.0	100.0	100.0		
	SSO Bamboo	1	5	5	1700.0	0.0	0.0		5
	Grand Total	49	164	3	206.2	76.8	81.1	49	42



## 5.2 Species Diversity under CAMPA Plantation

Diversity and intensity of tree species planted under different CAMPA enabled plantation schemes is summarized in table-5.3. The intensity of trees is calculated on the basis of number of trees per 10000 trees. Out of 11555 trees enumerated in different plantation sites, the maximum number trees are teak trees followed Acacia, Chakunda, Sisoo, Karanj, sirisa, Badachakunda, Gambhari, Khaira and Amala. These are 10 most important species raised under CAMPA nurseries and further used for plantation. Further Teak, Acasia and Chakunda constitute lion's share in overall plantation activity. There are 5250 teak trees, 1766 Acasia trees and 1105 chakunda trees for every 10000 surviving trees under CAMPA aided plantation activities. Overall, these three categories of trees account around 81 percent of the overall CAMPA plantation and these three types of trees are major tree species found under CAMPA plantation. Another 14 percent of the trees include Sisoo, Karanja, Sirisa, Bada Chakunda, Gambhari, Khaira and Amal, which are considered as second most important species categories. Remaining 4 percent of the tree varieties as shown in the following table are least important tree species considered under CAMPA plantation in the sample ranges of Berahmpur circle.

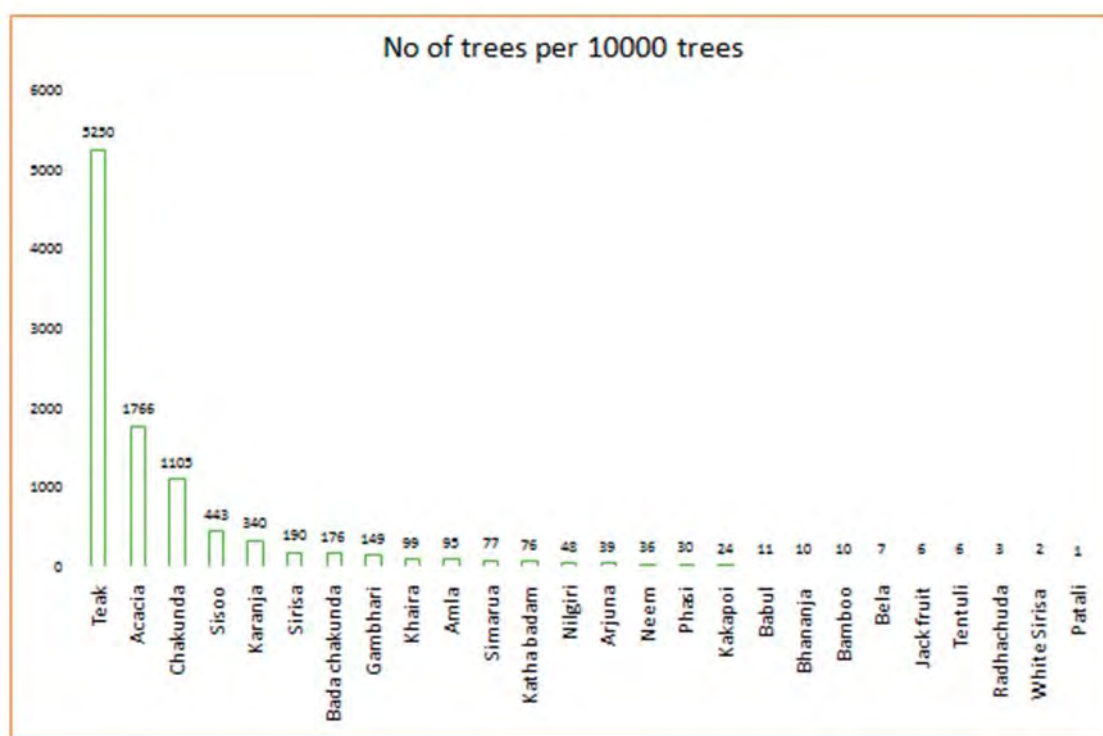


Figure 5.1: No of trees per 10000 trees





Table 5.3: Species Composition under CAMPA Plantation

Type of trees	Total No of trees in sample plots under all categories of Plantations	No of trees per 10000 trees	Ranking
Teak	6066	5250	1st
Acacia	2041	1766	2nd
Chakunda	1277	1105	3rd
Sisoo	512	443	4th
Karanja	393	340	5th
Sirisa	219	190	6th
Bada chakunda	203	176	7th
Gambhari	172	149	8th
Khaira	114	99	9th
Amla	110	95	10th
Simaruba	89	77	11th
Katha badam	88	76	12th
Nilgiri	56	48	13th
Arjuna	45	39	14th
Neem	42	36	15th
Phasi	35	30	16th
Kakapoi	28	24	17th
Babul	13	11	18th
Bhananja	12	10	19th
Bamboo	11	10	20th
Bela	8	7	21st
Jack fruit	7	6	22nd
Tentuli	7	6	23rd
Radhachuda	4	3	24th
White Sirisa	2	2	25th
Patali	1	1	26th
Grand Total	11555	10000	

### 5.3 Plantation Type and number of trees

On the basis of sample data, the number of trees per hectare of forest area taking into account different categories of plantation such as ANR with gap, avenue plantation, Bald hills plantation, Block plantation and compensatory ANR with gap plantation is calculated as per Table 5.4. The number of trees per hectare of forest area under ANR with gap plantation is found at 179 trees against the standard norm of 200 trees. However, for other types of plantations, compared to the norm, actual number of existing trees is found very less. In the case of avenue plantation, against the norm of 250 trees per KM, 240 trees are found. For bald hills and block plantation against the norm of 1600 trees per hectare, 1403 trees are found for bald hills plantation and 1434 trees are found for block plantation. As extent of survival rate under each category of plantation is above 85 percent, plantation performance is viewed satisfactory.



Table 5.4: Types of trees witnessed under differ plantation conditions per hectare of forest Area

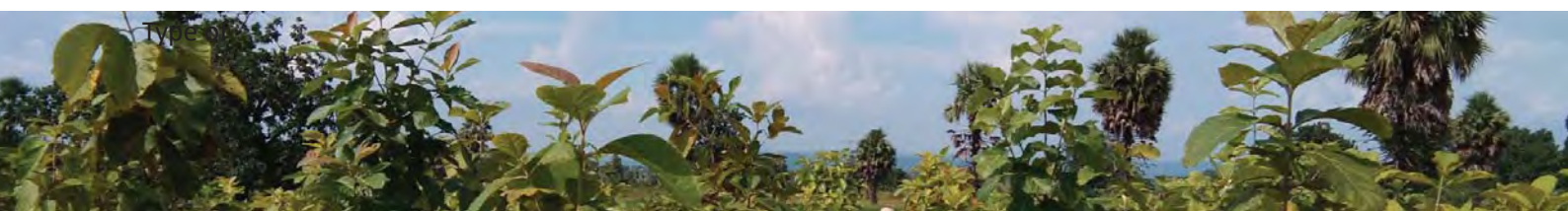
Type of Trees	Number of trees per hectare of forest Area			
	ANR with Gap (no of trees)	Avenue Plantation (No of trees/ KM)	Bald Hill Plantation (no of trees/ Hectrae)	Block Plantation (No of trees / Hectare)
No. of trees (found on the basis of sample data)	179	240	1403	1434
Plantation Norm	200	250	1600	1600
Survival Rtae%)	89.5	96.0	87.69	89.63
<b>Performance based on survival rate</b>	<b>Medium</b>	<b>High</b>	<b>Medium</b>	<b>Medium</b>

## 5.4 Height and GBH/GCH of Sampled out Trees

Year wise and type of plantation wise maximum and minimum height as well as maximum and minimum GBH/GCH considering all trees is shown in table-5.5. Considering all the years of plantation, the average height of trees is found maximum for bald hill plantations at 7.75 metres followed by avenue plantations (5.6 metres), Block Plantation (5.1 metres), ANR with gap plantation (2.5 metres) and compensatory ANR with gap plantation (1.35 metres). Similarly, the average GBH/GCH under avenue plantation is found maximum at 40.5 cms followed by bald hill plantations (30.7 CMs).

Table 5.5: Year wise and Type of Plantation wise Maximum, minimum height of trees (in Metre) and Maximum and minimum girth of trees (in CMs)

Type of Plantation	Years	Height (Metres)			GBH/GCH (CMs)		
		Maximum	Minimum	Average	Maximum	Minimum	Average
ANR with Gap	2014-15	4.9	1.9	3.4	17.4	6.3	11.85
	2015-16	2.7	1	1.85	8.3	3.6	5.95
	2016-17	3.6	1.5	2.55	13.5	5.5	9.5
	All Years	3.6	1.4	2.5	12.9	5.2	9.05
Avenue Plantation	2010-11	8.2	5.2	6.7	67.5	49.3	58.4
	2015-16	5.2	3.3	4.25	23.6	9.8	16.7
	All Years	6.8	4.4	5.6	47.5	33.5	40.5
Bald Hill Plantation	2012-13	11.2	7.6	9.4	40.4	26.4	33.4
	2013-14	10.3	5.3	7.8	48.8	18.3	33.55
	2016-17	3.8	2.5	3.15	20	10.3	15.15
	All Years	9.7	5.8	7.75	41.2	20.2	30.7
Block Plantation	2009-10	7.3	3.3	5.3	29.7	9.1	19.4
	2010-11	6.7	3.6	5.15	23.8	11.7	17.75
	2015-16	5.5	1.8	3.65	22.1	5	13.55
	All Years	6.7	3.5	5.1	24.1	11.3	17.7
Compensatory ANR with Gap plantation	2016-17	1.7	1	1.35	7.4	4.3	5.85
	All Years	1.7	1	1.35	7.4	4.3	5.85
<b>All Years and All Plantations</b>		<b>4.5</b>	<b>2.1</b>	<b>3.3</b>	<b>17.6</b>	<b>8.1</b>	<b>12.85</b>





## 5.5 Year wise Height and GBH/GCH of Major Trees

From the previous analysis it is known that teak, acacia, Bada Chakunda, Chakunda, karanja and sishoo are the major tree varieties planted under CAMPA during the period 2009-10 to 2016-17. As per table-5.6, it is found that the correlation coefficient between height and GBH/GCH for all the major types of trees is found in the range of 0.3 to 1 implying positive correlation between the stated variables. However, compared to other trees, the correlation coefficient for teak trees is found minimum because the extent of association between time and year of growth is non-systematic and it may be influenced by soil structure, terrain type and other factors.





Table - 5.6: Average Height &amp; GBH/GCH of Majors trees planted during the period of 2009-10 to 2016-17

Type of Plantation	Years	Height (Metres)						GBH/GCH (in CMs)							
		Maximum	Minimum	Average	Average Max. Height/ Year	Average Minimum Height/ Year	Difference between Average Maximum and Average Minimum Height per Yaer	Height Performance (High > or =0.5, Medium <0.5 or =1, Low >1, )	Maximum	Minimum	Average	Average Max. GBH/ GCH/ Year	Average Minimum GBH/ GCH/ Year	Difference between Average Maximum and Average Minimum GBH/GCH per Yaer	GBH/ GCH Performance (High < or =3.0 , Medium >3.0 or =5, Low >5, )
ANR with Gap	2014-15	4.9	1.9	3.4	0.8	0.3	0.5	High	17.4	6.3	11.9	2.9	1.1	1.9	High
	2015-16	2.7	1	1.85	0.4	0.1	0.2	High	8.3	3.6	6.0	1.2	0.5	0.7	High
	2016-17	3.6	1.5	2.55	0.9	0.4	0.5	High	13.5	5.5	9.5	3.4	1.4	2	High
	All Years	3.6	1.4	2.5	0.6	0.2	0.4	High	12.9	5.2	9.1	2.2	0.9	1.3	High
Avenue Plantation	2010-11	8.2	5.2	6.7	0.8	0.5	0.3	High	67.5	49.3	58.4	6.8	4.9	1.8	High
	2015-16	5.2	3.3	4.25	1	0.7	0.4	High	23.6	9.8	16.7	4.7	2	2.8	High
	All Years	6.8	4.4	5.6	0.9	0.6	0.3	High	47.5	33.5	40.5	6.3	4.5	1.9	High
	2012-13	11.2	7.6	9.4	1.6	1.1	0.5	High	40.4	26.4	33.4	5.8	3.8	2	High
Bald Hill Plantation	2013-14	10.3	5.3	7.8	1.7	0.9	0.8	Medium	48.8	18.3	33.6	8.1	3.1	5.1	Low
	2016-17	3.8	2.5	3.15	1.3	0.8	0.4	High	20	10.3	15.2	6.7	3.4	3.2	Medium
	All Years	9.7	5.8	7.75	1.8	1.1	0.7	Medium	41.2	20.2	30.7	7.8	3.8	4	Medium
	2009-10	7.3	3.3	5.3	0.7	0.3	0.4	High	29.7	9.1	19.4	3	0.9	2.1	High
Block Plantation	2010-11	6.7	3.6	5.15	0.7	0.4	0.3	High	23.8	11.7	17.8	2.6	1.3	1.3	High
	2015-16	5.5	1.8	3.65	1.4	0.5	0.9	Medium	22.1	5	13.6	5.5	1.3	4.3	Medium
	All Years	6.7	3.5	5.1	0.9	0.5	0.4	High	24.1	11.3	17.7	3.1	1.5	1.7	High
	2016-17	1.7	1	1.35	0.6	0.3	0.2	High	7.4	4.3	5.9	2.5	1.4	1	High
Compensatory ANR with Gap plantation															





## 5.6 Year wise Height and GBH/GCH of All Trees

From table-5.7, it is well observed that according to the age of trees, height and GBH/GCH are positively changed. However, there are some random variations in the height and GBH/GCH according to the age of plantation. Perhaps these are influenced by the variability of soil and micro climatic situations across different forest ranges of Berhampur subdivision.

*Table 5.7: Year wise Maximum, minimum height of trees (in Metre) and Maximum and minimum girth of trees (in CMs)*

Yeras	Height and GBH/ GCH of all trees planted under CAMPAs by Years					
	Max Height	Min Height	Average Height	Max GBH/ GCH	Min GBH/ GCH	Average GBH/ GCH
2009-10	7.3	3.3	5.3	29.7	9.1	19.4
2010-11	6.9	3.7	5.3	28.4	15.7	22.05
2012-13	11.2	7.6	9.4	40.4	26.4	33.4
2013-14	10.3	5.3	7.8	48.8	18.3	33.55
2014-15	4.9	1.9	3.4	17.4	6.3	11.85
2015-16	3	1.2	2.1	10.3	4.2	7.25
2016-17	3.4	1.4	2.4	12.9	5.4	9.15
<b>Overall</b>	<b>4.5</b>	<b>2.1</b>	<b>3.3</b>	<b>17.6</b>	<b>8.1</b>	<b>12.85</b>

## 5.7 Pillars Posted and Geo Tagging

As a rule, under CAMPAs implementation of plantation programme all the plantation sites are to be covered with pillars having geo tagged. Out of the total number of 2631 pillars around sample sites, during evaluation, only 206 pillars were witnessed.



### Case Study: Protection of Century Old Red Sandalwood Forest at Lavanyagarh under CAMPA

**Circle: Berhampur, Division: Paralakhemundi, Range: Mohendra, Section: Garabandha, Beat: Lavaynagarh**

Red sandalwood, locally called “Rakta Chandan” with scientific name *Pterocarpus santalinus* is one of the listed items of the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES). Red Sandalwood, is a native and endemic to India and can only be found in the southern parts of the Eastern Ghats. It is a small tree that grows to 5-8 meters in height and has a dark grayish bark. The timber is highly demanded domestically and internationally, and especially in East Asian countries.<sup>20</sup> Erstwhile princely rulers of Paralakhemundi had created a 31-acre red sandalwood forest in 19th century at a site nearby to Labanyagada village forest. This place is located in the border of the present day Gajapati district of Odisha and Srikakulam district of Andhra Pradesh. About 750 century old red sandal wood trees were found at this site by 2015. Due to the high economic value of these tree species, in recent years a number of theft cases were registered and caused a lot of degradation of this site. In the year 2014-15, forest department under CAMPA fund, took up the patch under ANR without Gap management practice and consequently a series of protection measures were introduced for the protection of the site. Along with protection measures, Subsidiary Silvicultural Operations (SSOs) including cleaning and weeding were initiated. A watch tower was constructed on the site for keeping an eye against theft and illicit felling of red sandalwood trees. Furthermore, three different camps were also organized to spread awareness among the forest fringe villagers. It is reported by the community and forest officials that this rare site is sufficiently protected as a result of CAMPA led plantation activities. A number of trees were damaged during last “Titli” cyclone in 2018. The uprooted and broken trees were subsequently handed over to Odisha Forest Development Corporation.



<sup>20</sup> Patra, Biswajit. (2015). Labanyagada: The protected red sandal forest of Gajapati district, Odisha, India.

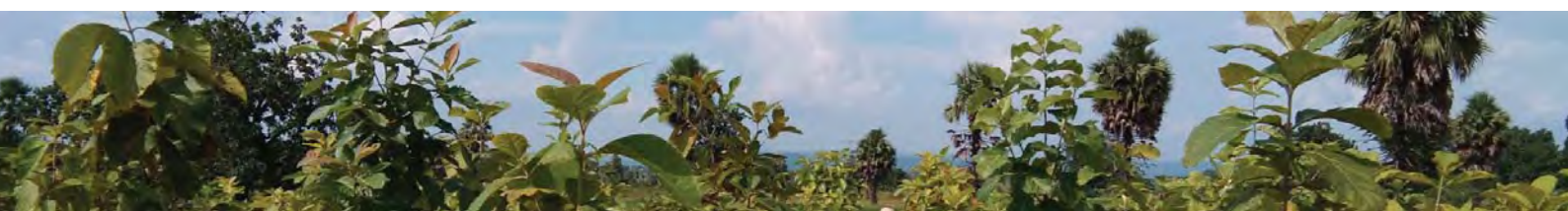




Table 5.8: Total No of Pillars posted and number of pillars witnessed for the sampled-out plantation sites

Type ofplantation	Balliguda		Berhampur		Boudh		Ghumshar South		Ghumshur North		Paralakh-emundi		Phulbani		All Diivision		
	Insta-lled	witne-ssed	Insta-lled	witne-ssed	Insta-lled	witne-ssed	Insta-lled	witne-ssed	Insta-lled	witne-ssed	Insta-lled	witne-ssed	Insta-lled	witne-ssed	Insta-lled	witne-ssed	%
ANR with GAP	289	20	53	7	460	41	13	0	75	18	235	11	354	35	1479	132	24.6
ANR without Gap									0	0	0	0	0		0	0	
ANR without Gap (AJY)	63	3									150	6			213	9	4.2
Avenue Plantation									0	0	0	0			0	0	
Bald Hill Plantation			36	5			32	4							68	9	13.2
Block Plantation	28	3	59	4	187	2	117	20		6	62	4	38	4	491	43	8.8
Compensa-tory ANR																	
with Gap plantation							44	5							44	5	11.4
Management of Old Teak			0	0					36	6					36	6	16.7
SSO Bamboo			15	2			0	0	0	0	0	0	0		15	2	13.3
SSO Timber	0				285										285		0.0
Grand Total	380	26	163	18	932	43	206	29	111	30	447	21	392	39	2631	206	7.8



Table 5.9: Year wise and Type of plantation wise Total No of Pillars posted and number of pillars verified for the sampled-out plantation sites

Type of plantation	Years	Total no. of pillars installed and witnessed by forest divisions													
		Balliguda		Berhampur		Boudh		Ghumshar South		Ghumshar North		Paralakh-emundi		Phulbani	
		Insta-lled	witne-ssed	Insta-lled	witne-ssed	Insta-lled	witne-ssed	Insta-lled	witne-ssed	Insta-lled	witne-ssed	Insta-lled	witne-ssed	Insta-lled	witne-ssed
ANR with Gap	2013-14														
	2014-15	214	14		6	105							3	319	23
	2015-16	75	6					13					32	442	38
	2016-17			53	35	355	41			75	18	235		718	71
	All Years	289	20	53	7	460	7	13		75	18	235	35	1479	132
ANR without Gap	2009-10									0	0			0	0
	2011-12												0	0	
	2014-15											0	0	0	0
	All Years									0	0	0	0	0	0
	2016-17	63	3									150	6	213	9
ANR without Gap (AJY)	All Years	63	3									150	6	213	9
	2010-11									0	0			0	0
	2015-16											0	0	0	0
	All Years									0	0	0	0	0	0
	2012-13			16	3									16	3
Bald Hill Plantation	2013-14			20	2									20	2
	2016-17							32	4					32	4
	All Years			36	5			32	4					68	9





Type of plantation	Years	Total no. of pillars installed and witnessed by forest divisions															
		Balliguda		Berhampur		Boudh		Ghumshar South		Ghumsur North		Paralakh-emundi		Phulbani		All Division	
		Insta- lled	witne- ssed	Insta- lled	witne- ssed	Insta- lled	witne- ssed	Insta- lled	witne- ssed	Insta- lled	witne- ssed	Insta- lled	witne- ssed	Insta- lled	witne- ssed	Insta- lled	witne- ssed
Block Plantation	2009-10					25	2	36	8					38	4	99	14
	2010-11			59	4	162	0	81	12		6	62	4			364	26
	2015-16	28	3													28	3
	All Years	28	3	59	4	187	2	117	20		6	62	4	38	4	491	43
Compensatory ANR with Gap plantation	2016-17							44	5							44	5
	All Years							44	5							44	5
Management of Old Teak	2012-13			0	0											0	0
	2013-14									36	6					36	6
	All Years			0	0					36	6					36	6
SSO Bamboo	2013-14							0	0	0	0					0	0
	2014-15											0	0			0	0
	2015-16			15	2											15	2
	2016-17													0		0	
SSO Timber	All Years			15	2			0	0	0	0	0	0	0		15	2
	2014-15	0				285										285	
Grand Total	All Years	0				285										285	
		380	26	163	18	932	43	206	29	111	30	447	21	392	39	2631	206



## 5.7 Status of CRM

Conservation, Regeneration and Management of Natural Forest comprises important activities undertaken under CAMPA implementation which include regeneration of degraded forests, subsidiary silvicultural operations, and conservation of economic species. Overall forest area covered under different CRM activities per each forest range in all forest divisions is shown in the following table. It is observed that about 6668 hectares of forest land per range is treated under silvicultural operations during the period 2009-06 to 2016-17. About 4980.8 hectares of degraded bamboo forest area is treated with regeneration activities. Out of seven forest divisions, regeneration of timber was undertaken in four forest divisions, silvicultural operations are undertaken in three forest division. Regeneration of OWP revenue forest area was undertaken only in Paralakhemundi division. Conservation of old teaks plantations and economic species are done in Berhampur and Ghumsur South forest divisions. Except Baliguda division, regeneration of bamboo forests is undertaken in all of the forest divisions. The type of activities undertaken for CRM activities is shown in Table-5.10 given ahead.

*Table 5.10: Status of CRM Activities*

Divisions	Gross Area covered in Hectares / Forest Range					
	Regeneration of Timber	Silvi-operations	OWP (Revenue Forest)	Old Teak	Regeneration of degraded Bamboo forest	Economic species
Baliguda	1603.3					
Berhampur				160.0	3070.0	225.0
Boudh					225.0	
Ghumusur North	1720.0	13679.1			8410.0	
Ghumusur South	1000.0	5164.9		291.7	9420.0	100.0
Paralakhemundi	714.0	1160.0	200.0		4200.0	
Phulbani					4560.0	
All Circles	1259.3	6668.0	200.0	225.8	4980.8	162.5
% of divisions involved in CRM Activities	57.1	42.9	14.3	28.6	85.7	28.6

On the basis of sample coverage of CRM activities, the type of species regenerated under different plantation situations and investigators remarks are indicated in table-5.11. Due to CRM activities consisting of SSO timber undertaken under CAMPA maximum number of species are regenerated. There are 17 species regenerated. The number of regenerated species at Boudh, Phulbani, Ghumsur (North) is also found very much encouraging. Red sandal wood and piasal trees were found regenerated at Mahendra range of Paralakhemundi forest division. On the basis of investigators' observations, due to SSO activities, the height and GBH/GCH of the existing trees have also increased. Similarly, at Tarasing range of Ghumsur(North) forest division, due to SMC works and consequently better mulching effect, high species diversity was noticed by the study team.





Table 5.11: ANR and SSO Activities at different sample sites

Division	Range	Type of Assets	Indigenous species	No of species regenerated	Evaluators' Observations
Phulbani	Phiringia	ANR without Gap	Sal, Chara, Kendu, harida, asana, piasala, pita kelucha, Bamboo, sirisa, dhupa etc.	10	Fire line maintenance, weed eradication, SMC works have been done here. Dominating species is Sal.  Due to intervention, height and girth of plants have increased significantly.
Paralakhe-mundi	Mohendra	ANR without Gap	Pia sal	1	The patch was covered with previously grown Pia sal trees of highest height 20m and GBH 180cm. Lowest height is 9m and girth is 98cm. Thinning of branches and weed removal led to better growth of trees.
Paralakhe-mundi	Mohendra	ANR without Gap	Red Sandalwood	1	The patch was covered with red sandalwood planted during 1990. A watch tower under CAMPA has been set up where guards stay and protect the area against theft.  The plantation was heavily damaged due to Titli cyclone.  Red sandalwood highest height 25m and girth 178cm. Lowest height 18m and girth 78cm was measure during evaluation.
Ghumsur North	Tarasingi	ANR without Gap	Sal, Chara, Dhau, Kendu, Achu, Mahula, Jamun, Kusum	8	Forest was very dense with high species diversity; Soil moisture was relatively high due to mulching effect.
Ghumsur North	Tarasingi	Old Teak management	Teak	1	The Plantation was done in 1980 but due to lack of management and maintenance, the growth of the plants was branchy, stunted and half broken. Due to CAMPA implementation from 2012 onwards, the growth of the planted trees has increased to a certain extent. Also there was an increase in species diversity.



Division	Range	Type of Assets	Indigenous species	No of species regenerated	Evaluators' Observations
Berhampur	Khalikote	Old Teak management	Teak	1	The patch is covered with old teak trees. Maximum height and girth are 25m and 111cm. Minimum height and girth are 9m and 40cm. The site was devoid of natural regeneration. Due to intervention, better growth is observed.
Boudh	Madhapur	SSO Timber	Sal, Chara, Kusum, Jamun, Dhaura, Mahula, Asana, Bamboo, Kendu, Piasal, Bandhana, Mai	12	The Patch is a dense sal forest. Steep, slopy and very rocky. LBCDs are done to protect the soil and arrest flow of stream and rainwater. Fire line was maintained.
Balliguda	Simanbadi	SSO Timber	Kendu, Karda, Dhou, Achu, Dhala kaincha, Mahi, Mahula, Kantei Koli, Salapa, Neem, Chakunda, Sirisa, Amba, Sisoo, Sunari, Kusum	17	Climber cutting, fire line maintenance, high stump cutting works are done. LBCD was done to protect the soil and arrest the flow of stream.

## 5.8 Soil and Moisture Conservation (SMC) Structures

On the basis of sample ranges visited by the study team it is evident very limited varieties of SMC structures are taken up under CAMPA intervention. As it is observed from the following table 5.12, staggered trench, and LBCD are mainly implemented in majority of forest divisions. However, at Paralakhemundi division, other SMC structures like guard wall, percolation pit and animal proof trenches are also noticed. Compared to all SMC trenches, the incidence of staggered trenches is higher in all the forest divisions except Ghumsur (North) division, where incidence of LBCD is relatively higher. The average picture of staggered trenches, LBCDs, Guard wall, percolation pit and animal proof trench per forest range in all divisions is calculated at 45149 nos, 7558 nos, 2007 metre, 32000 nos and 800 metre respectively.

Table 5.12: No. of SMC structures taken up per forest range

Name of Division	Quantity of SMC Structures per range				
	Staggered Trench (No.)	LBCD (No.)	Guard Wall (m)	Percolation Pit (No.)	Animal Proof Trench (m)
Ghumsur North	7277	21816			
Berhampur	142200				
Boudh	27608	455			
Paralakhemundi	47640	403	2007	32000	800
Baliguda	1110				
Ghumsur South					
Phulbani	1021				
All Divisions	45149	7558	2007	32000	800





On the basis of sample visit of plantation sites, it was found that LBCD, staggered trenches and half-moon trenches are the commonly found SMC structures in all plantation sites. As observed from the following table-5.13, the average extent of siltation is found to the extent of 47 percent. However, in some old plantations carried out in the year 2011-12 and 2012-13, the extent of siltation is observed in between 80 to 100 percent. More types of SMC structures like cause-way and contour bounds were found in Ghumsur (North) forest Division. Taking note of average amount of siltation in all type of SMC structure is to the extent of 47 percent and the average depth of different type of trenched is 18 CMs, it may be said that due to SMC structures, moisture stress for planted trees is promoted. Apart from it, such type of SMC structures also prevents soil erosion and promotes regeneration of trees at plantation sites.

*Table 5.13: Type of SMC structures reported at Plantation sites*

Divisions	Type of SMC Structures	Average of Extent of Siltation (%)	Performance of SMC works (If siltation percentage is > or =50, High, <50 and > or= 30, Medium, <30, Low)
Baligida	<ul style="list-style-type: none"> <li>Half-moon trench with Stone packing,</li> <li>LBCD</li> <li>Staggered Trench</li> </ul>	47.4	Medium
Berhampur	<ul style="list-style-type: none"> <li>Staggered trench</li> <li>LBCD</li> </ul>	0.6	Low
Boudh	<ul style="list-style-type: none"> <li>Half- moon trench</li> <li>LBCD lower hill sideStone packing</li> <li>LBCD</li> </ul>	51.7	High
Ghumshar South	<ul style="list-style-type: none"> <li>Half Moon trench-stone packing</li> <li>Half-moon trench without packing</li> <li>Staggered Trench</li> </ul>	28.2	Low
Ghumsur North	<ul style="list-style-type: none"> <li>staggered trench</li> <li>Contour Bund,</li> <li>Half Moon Trench</li> <li>LBCD</li> </ul>	66.1	High
Paralakhemundi	<ul style="list-style-type: none"> <li>Half-moon trenches</li> <li>LBCD</li> <li>Stagger Trench</li> </ul>	73.0	High
Phulbani	<ul style="list-style-type: none"> <li>Check Dam,</li> <li>Staggered trench,</li> <li>LBCD</li> <li>Half-moon trench,</li> <li>Stone bunding</li> </ul>	0.6	Low
Overall	<ul style="list-style-type: none"> <li>All SMC Structures</li> </ul>	45.7	Medium



## 5.9 Subsidiary Silvicultural Operations- Bamboo

The status of SSO bamboo was examined by analyzing the sample information obtained from selected sites under each of the forest divisions in Berhampur circle. The average area of sample bamboo sites is 518 hectares. The sample sites are pretty old bamboo forest sites and with CAMPA funds' support, SSO activities were carried out during the period 2013-14 to 2016-17.

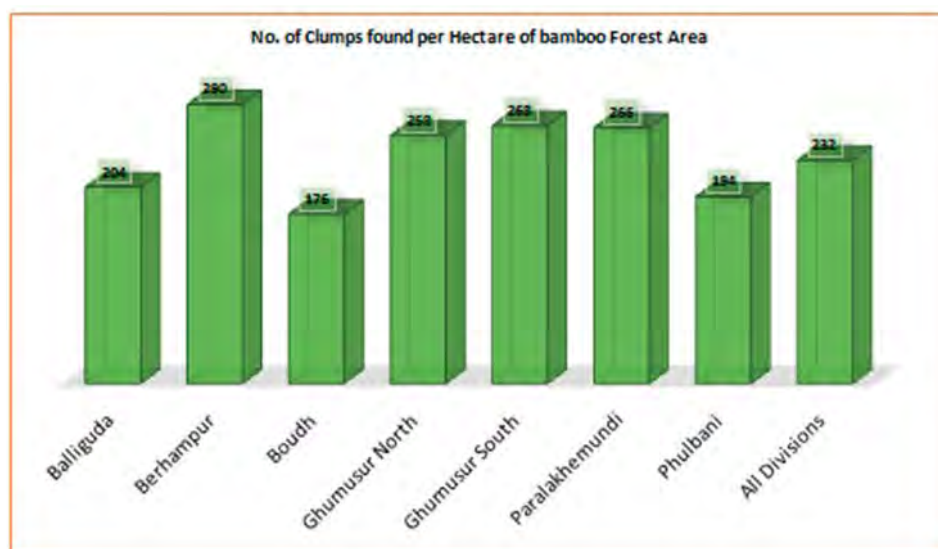


Figure 5.1: No. of clumps found per hector of bamboo forest area

There are about 232 clumps per hectare of forest area. On an average 37 clumps are damaged per hectare of forest land. Compared to the norm of 50 number of clumps, as the bamboo forests are very old forests a greater number of clumps are found. Division wise average number of clumps found is shown in the chart given alongside. The extent of damaged clumps is found more at Berhampur and Paralakhemundi divisions compared to other divisions. With the support of silvicultural operations, 1st year culms, 2nd year culms and more than 2 years culms, etc. were evaluated. Overall, the number of 1st year culms, 2nd year culms and >2 years' culms per hectare were found at 1784, 4011 and 3279 respectively.

Table 5.14: Performance of SSO bamboo after CAMPA intervention

Divisions	Year of silvicultural Operations	Average area (in Ha.)	Average No. per hectare of bamboo forest area					Clumps damaged as % to total clumps	Casualty based performance
			Clumps found	Clumps damaged	1st year culms	2nd year culm	More than 2 years		
Balliguda	2014-15	800	204	32	1566	3662	6372	15.7	Medium
Berhampur	2015-16	30	290	110	1060	3460	2920	37.9	Low
Boudh	2016-17	100	176	0	894	6892	328	0.0	High
Ghumusur North	2013-14	200	258	12	3560	3904	3848	4.7	High
Ghumusur South	2013-14	304	268	44	1690	2084	1562	16.4	Medium
Paralakhemundi	2014-15	200	266	100	2782	6962	7296	37.6	Low
Phulbani	2016-17	1700	194	2	504	780	410	1.0	High
Grand Total	All Years	518	232	37	1784	4011	3279	15.9	Medium





Under SSO activities of CAMPA intervention, removal of congestion was undertaken in Boudh, Ghumshur (South) and Ghumshur (North) forest divisions in the years 2013-14 and 2016-17. In the remaining forest divisions, removal of congestion is not reported.

*Table 5.15: Removal of Congestion at bamboo forest sites undertaken under SSO-bamboo of CAMPA implementation*

Divisions	Number of forest sites undertaken removal of congestion under SSO-bamboo by year of undertaking		
	2013-14	2016-17	Total
Boudh		5.0	5.0
Ghumshur South	5.0		5.0
Ghumshur North	5.0		5.0
All divisions	10.0	10.0	30.0

## 5.10 Forest Protection

Forest protection generally comprises general protection and fire protection. A lot of measures have been initiated under CAMPA in all the forest divisions. Major activities include appointment forest squads, foot patrolling, support to the existing JFMs in the immediate neighbourhood and Fireline before the onset forest fire seasons. As it is observed from the following table 5.16, on an average, 494 kms of Fireline is prepared per forest range. In some selected ranges under Berhampur and Ghumshur (North) forest divisions, local JFMs were involved for forest protection. There are about 64 para staff per range employed for forest protection.

*Table 5.16: Forest Protection Measures*

Sl.	Division	Forest fire protection measures (KMs of Fire line made)	No of JFMCs Supported	Total no of Para staff employed
1	Baliguda			1
2	Berhampur	688	14	74
3	Boudh	310		50
4	Ghumshur North	558.5	22	33
5	Ghumshur South	500		120
6	Parlakhemundi	404		110
7	Phulbani	501		60
	<b>All Divisions</b>	<b>494</b>	<b>18</b>	<b>64</b>

In addition to general forest protection measures, other measures which were come across during sample-based field survey, are as per the following table. As it can be seen from the following table-5.17, in addition to general protection measures, watch and word with the involvement of local people is a major forest protection measure. However, watch and word type of measures are stopped after 4th year and general protection measures of the forest department continues after 4th year of plantation.

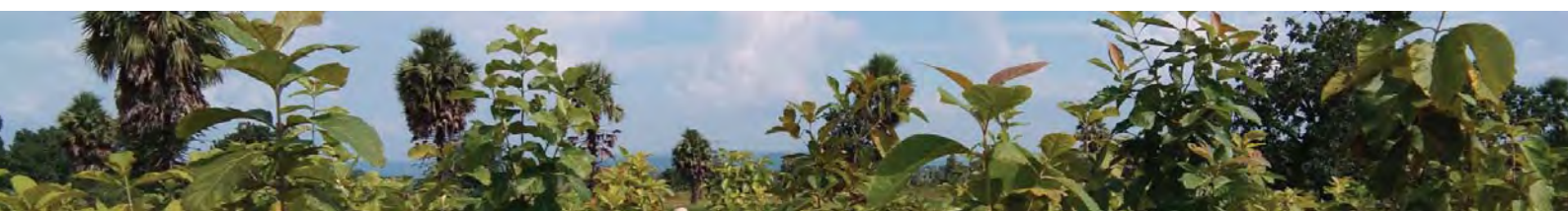


Table 5.17: Forest Protection measure as reported during sample survey of Plantation sites

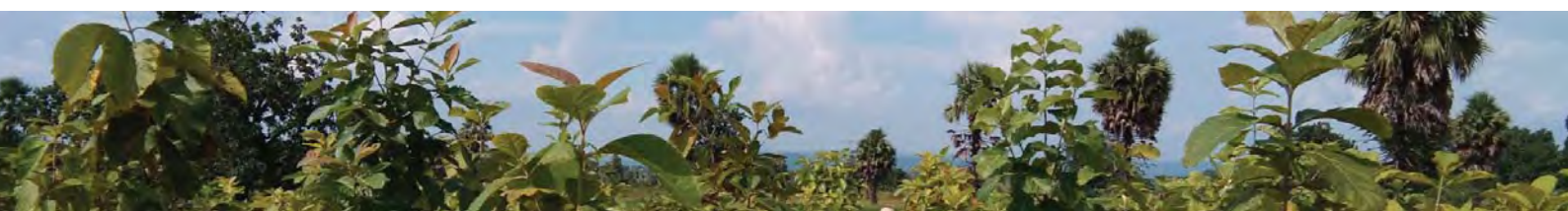
Division Name	Forest Protection Measure
Balliguda	General Protection
	Watch & ward by Community Members
Berhampur	Forest Guard and a local village people were deployed for watch & ward
	Two persons from nearby village deployed for watch and ward
	Watch & ward for first 4 years, and beyond 4th year, there is no protection measure due to exceed of time.
Boudh	General Protection
	Watch and Ward
Ghumshar South	Only General Protection by departmental people
Ghumshar North	General protection and Fire protection by the departmental people
Paralakhemundi	General protection
	Supported by local VSSs
	Watch and Ward
Phulbani	Locals are engaged for watch and ward
	Protection measure is taken by forest department
	Watch and ward for upto 4th year of plantation
	Fencing

### 5.11 Wild Life Management

Towards wild life management, a broad range of activities have been taken up under forest divisions. The activities can be broadly described as strengthening of wild life infrastructure which encompasses anti-poaching activities, anti -depredation activities, habitat improvement measures, weed treatment, meadows development and fodder plantation. As it is shown in the following table 5.18, the important fauna present in all the forest divisions include elephant, leopard, boar, spotted deer, hyena, barking deer, wild boars, etc. These wild animals need conservation for which sustainable habitat is attempted under CAMPA implementation.

Table 5.18: Division wise important Fauna

Divisions	Prominent wild species
Balliguda	Bear, Barking Deer, Hyena, Fox, Monkey, Katasa, Peacock, Porcupine,
Rabbit, Wild Boar, Jackal, Elephant	Rabbit, Wild Boar, Jackal, Elephant
Berhampur	Deer, Barking Deer, Jackal. Peacock, Elephant, Langur, Rabbit, Wild Boar
Spotted deer	Spotted deer
Boudh	Barking deer, Bear, Fox, Deer, Peacock, Elephant, Leopard, Hyena, Wild Boar, Rabbit, Monkey
Ghumshar South	Elephant, Barking Deer, Langur, , Black Buck, Peacock, Leopard, Hyena, , Wild Boar, , Rabbit, Spotted Deer.
Ghumshar North	Barking Deer, Elephant, Wild boar, Fox, spotted deer, Rabbit
Peacock, Spotted Deer	Peacock, Spotted Deer
Paralakhemundi	Barking deer, Bana Kukuda, Fox, Hyena, Deer, Fox, Jungle chicken, Peacock, Wild Boar, Porcupine, Python, Saliapatini, Elephant





Divisions	Prominent wild species
Phulbani	Barking deer, Bear, Deer, Jackal, Langur, Leopard, Wild Boar, rabbit., Elephant

**Anti-Poaching Activities:** Anti-poaching activities consisting of arresting people involved in poaching activities of wild birds and animals, rescuing and rehabilitating wild birds and animals threatened by the poachers and arresting the accused. From the following table-5.19 it is observed that there were 7 poaching cases registered per range under all forest divisions. Similarly, per range 21 wild animals were rescued and rehabilitated and per range 11 people were arrested due to their involvement of poaching of wild birds/ animals. It is reported that the anti-poaching squads appointed under CAMPA have contributed greatly to anti-poaching activities.

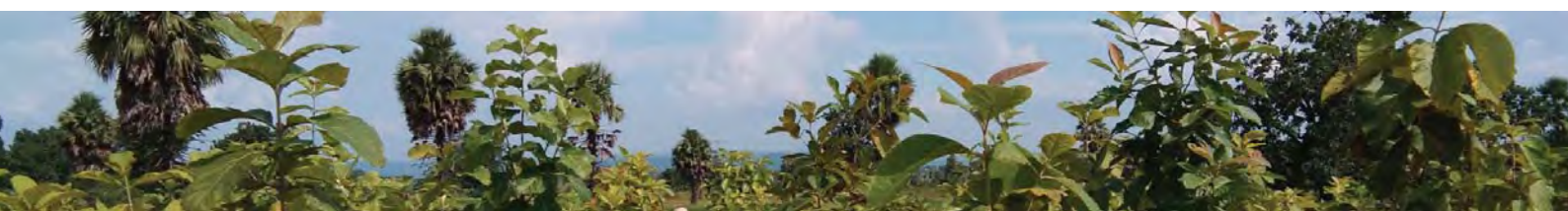
*Table 5.19: Anti-Poaching Activities per Forest Range*

Division	No of Poaching Cases reported	No of Animal rescued and rehabilitated	Quantity of forest produced seized	No of Accused arrested
Baliguda	3			16
Berhampur	13	41	162 (Bamboo)	15
Boudh	9			6
Ghumusur North	10	1	5 (animal)	5
Ghumusur South				
Parlakhemundi	1		1(Leopard skin)	
Phulbani				

**Anti-Depredation Activities:** As a part of anti-depredation activities, steps initiated by forest ranges are found to be situation specific. Except Baliguda forest Division, Anti- depredation squads are appointed by all forest divisions. Elephant trackers are appointed under Berhampur division. Torch, mike set and sound system are reported to have been introduced under Boudh division to avoid interference of wild animals in human habitats. Except Baliguda Division, wild life squads are also appointed under each range of the remaining forest divisions. Incidence of human animal conflict is found higher at Boudh division followed by Ghumsur north division. There were about 11 human animal conflict cases per range were reported in Boudh division. Interaction with forest officials it is found that due to protection squads and anti depredation squads, human animal conflicts are reduced as few of the para staff and squads very much actively work as elephant trackers.

*Table 5.20: Reported anti-depredation Activities*

Division	Type of Anti Depredation activities	Wild life Squads	No of Human – animal conflict cases reported/ Range
Berhampur	Elephant Trackers	10 nos of Wild Life Squad & 1 no of Wild Life vehicle	No
Boudh	Torch, Lamp, Mike set, sound system	59	11
Ghumusur North	Anti-Depredation Squads (ADSs)	11	1
Ghumusur South	Anti-Depredation Squads (ADSs)	2	-
Parlakhemundi	Anti-Depredation Squads (ADSs)	13	-
Phulbani	Anti-Depredation Squads (ADSs)	-	-



**Habitat Improvement:** Last year under habitat improvement programme initiated under CAMPA, cattle camps were organized in all forest divisions except Baliguda and Berhampur division. About 4 such camps per forest range was organized, and on an average per range 1736 numbers of cattle were immunized. There are no such data available at range level regarding cattle death due to disease outbreak and this implies that cattle camps have positively contributed.

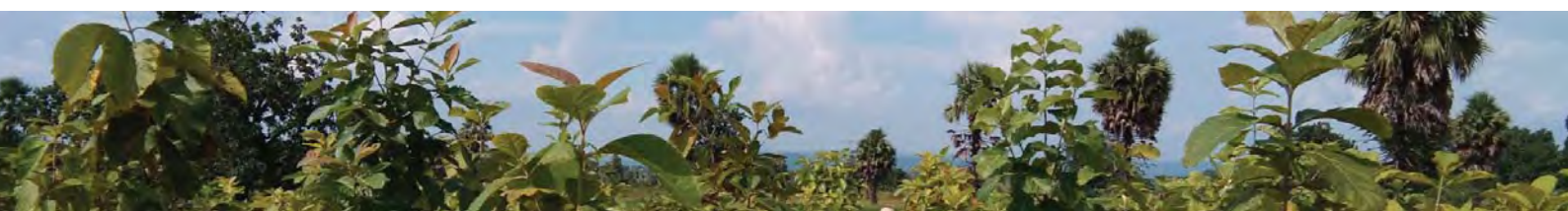
*Table 5.21: Habitat improvement Programme*

Division	No of Cattle's Camps organized	No of Cattle's Immunized
Baliguda		
Berhampur		
Boudh	4	3127
Ghumusur North	2	345
Ghumusur South	1	
Parlakhemundi	13	
Phulbani	1	
All Divisions	4	1736

**Weed Treatment, Meadows and Fodder Development:** As it is observed from the following table-5.22, about 107.3 hectares of forest land per range was taken up for weed treatment and 33.6 hectares were taken up for meadow development. Fruit bearing trees for fodder purposes were considered in selected forest ranges of Boudh division. On an average, 125 hectares of forest land per range was covered under fruit bearing fodder plantation. The aim of such fodder plantation was to minimise human animal conflict as most often wild animals enter into human habitations owing to the absence of plenty of fodder in forest area. Towards drinking water requirements of wild animals on an average 2 numbers of water bodies per forest range was created under Ghumsur (North) forest division.

*Table 5.22: Weed Treatment, meadow and Fodder development*

Sl.	Division	Weed Treatment (Ha. Of forest area covers)	Meadows development (Ha. Of forest area covers)	Fruit bearing plantation for fodder (Ha. Of forest area covers)
1	Baliguda			
2	Berhampur		50	
3	Boudh	40		125
4	Ghumusur North	7.5		2 no of water body + 2.6 ha of forest area
5	Ghumusur South			
6	Parlakhemundi	274.4	17.286	
7	Phulbani			
	All Divisions	107.3		





## 5.12 Support to Sacred Groves

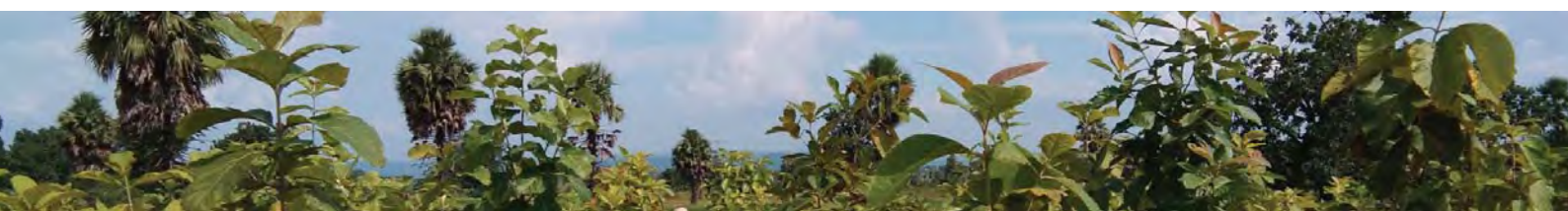
On the basis of sample observation of three sacred groves under Ghumsur (South) and Boudh divisions, it is found that creation of boundary wall is undertaken in 2 out of 3 sacred groves. Boundary wall and plantation of trees are created in 1 out of 3 sacred groves. It is suggested that there should be fresh plantation and creation of tube wells in all the sacred grove sites. All the sacred groves are found being worshipped by the local people regularly. Due to such intervention, community members are aware about the positive impacts of afforestation. Besides, they are sufficiently aware about the objectives and mission of CAMPA.

*Table 5.23: Usability of sacred groves*

Sl.	Site	Current Status	Type of Current Use	Quality of the asset	Suggestions
1	Sacred Grove, Banjara Section, Badagada Range, Ghumsur (South)	Being used	Regular worship	Tube well and plantation of 100 teak trees under CAMPA funds	
2	Sacred Grove, Ramanmbadi bit, Gajalbadi-South section, Sorada Range, Ghumsur (South) division	Being used	Regular worship	Boundary wall under CAMPA	
3	Sacred Grove, Madhapur Beat, Baringi Section, Madhapur Range, Boudh Division	Being used	Used as sacred grove	Boundary Plantation and painting. Trees are being worshipped. However, no plantation has been done	There should be plantation of trees as per community's suggestions.

## 5.13 Entry Point Activities (EPAs)

Under CAMPA implementation, entry point activities are not focussed in all the forest divisions. However, it is implemented at limited number of sites of three forest divisions- Baliguda, Berhampur and Ghumsur (North) forest divisions. A drying yard is constructed at Kadakudupa site under Baliguda subdivision; utensils were distributed at Boxiplai and Panasdiha under Berhampur subdivision. However, Ghumsur (North) forest division is found to have



implemented number of EPAs at different sites and the assets created under EPA include construction of toilet at nursery site, bore/tube well and creation of nurseries, drinking water facilities for the villagers etc. The limited number of EPAs were done in the initial years of CAMPA implementation. From 2011-12 year onwards, EPAs were altogether stopped as per decision at higher level.

*Table 5.24: Type of EPAs implemented under CAMPA*

Division	Type of EPAs	Name of the Site
Baliguda	Drying yard	Kadakudupa
Berhampur	Utensils-2 no	Boxipalli, Panasadiha
Boudh	EPAs not implemented	
Ghumsur North	Construction of Toilet at Nursery Site	Saluapalli
	EPA- Bore/ Tube well	R.O Campus Tarasinghi
	EPA-Nursery	R.O Campus Tarasinghi
Ghumusur South	EPAs not implemented	
Parlakhemundi	EPAs not implemented	
Phulbani	EPAs not implemented	

## 5.14 Training and Capacity Development

With respect to capacity development measures for forest department officials, a number of training programmes are conducted at range level. From the following table, it is evident that on an average 16 training programmes are conducted per range in all forest divisions. As it is revealed from the following table-5.25, number of training programmes per range is found minimum at Berhampur and Parlakhemundi division as against maximum number of training programmes at Baliguda division followed by Boudh division.

*Table 5.25: Number of training Programmes and participants per range under CAMPA*

Division	Number of training programmes/ Range	Number of participants/ Range
Baliguda	26	1119
Berhampur	6	174
Boudh	25	3520
Ghumusur North	17	All Range staff
Ghumusur South	14	All Range staff
Parlakhemundi	6	217
Phulbani	8	All Range staff
All Divisions	16	

## 5.15 IT enabled work efficiency

In addition to capacity development measures, IT efficiency of forest ranges were also considered under CAMPA by equipping range offices with computers and GPS devices. Besides computer skills were also promoted at range level. As a part of tracking foot patrolling by the section and bit level officers, PDF machines were provided to the people entrusted with the task of foot patrolling. As it is shown in the following table, on an average there are 2 computers and 4 computer skilled people per range. Out of 4





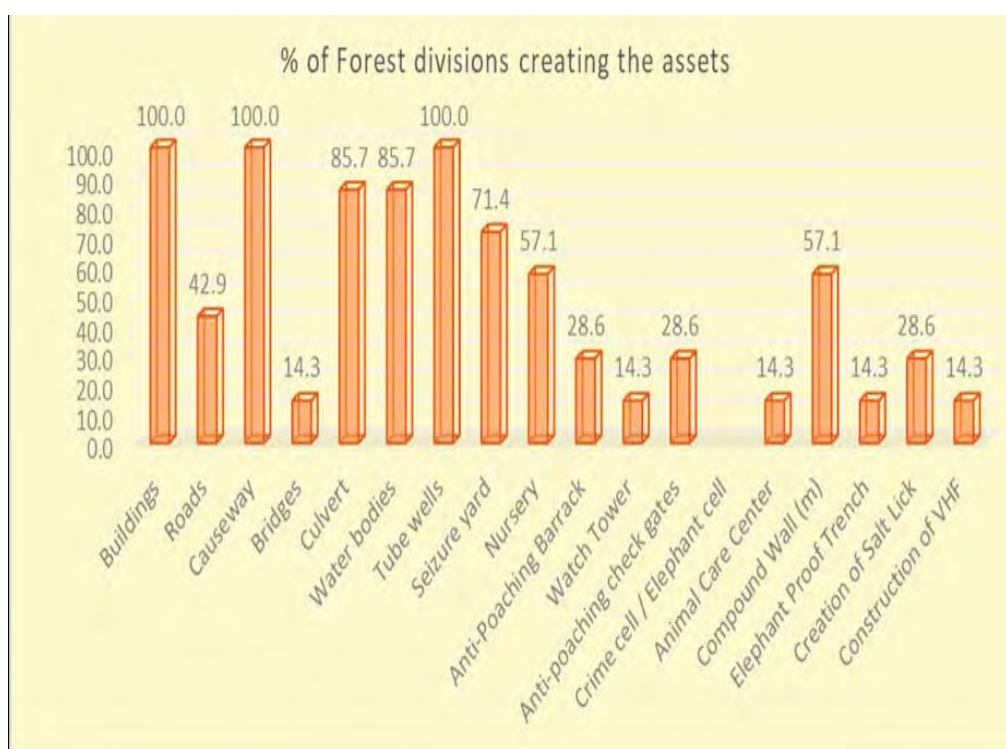
computers available, 2 computers are to be found functioning. There are 9 GPS devices and 4 PDA machines available per range. Due to better IT skill development, even at range level, forest officers are able to maintain proper database. They are able to get fire information directly from the nodal control room. Due to mainstreaming of GPS technology, forest officials are able to reach directly at the forest fire point.

*Table 5.26: Number Computers, commuter skilled personnel, and GPS devices per forest range*

Division	Computers	Persons equipped with computer skills	Computers currently used	GPS	PDA (foot patrolling)
Baliguda	2	2	2	15	5
Berhampur	2	1	2	11	4
Boudh	2	10	1	9	4
Ghumusur North	2	1	2	8	4
Ghumusur South	1				4
Parlakhemundi	3	3	2	3	4
Phulbani	2	4	2		4
All divisions	2	4	2	9	4

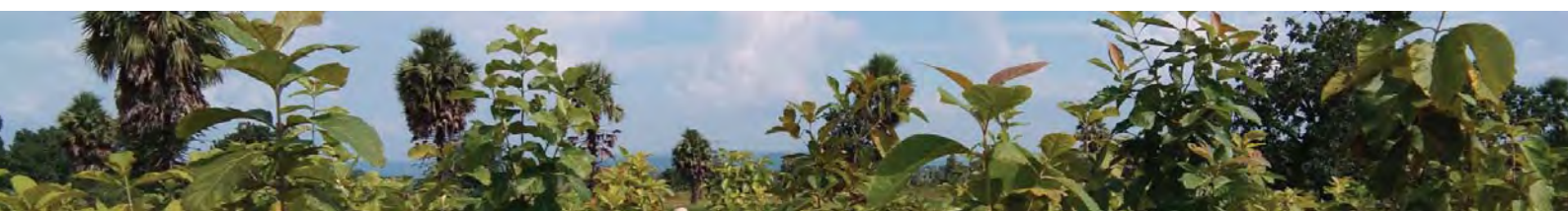
## 5.16 Infrastructure Development

Infrastructure development consists of a broad range of assets created under CAMPA for the smooth operation and management of the departmental activities mostly aiming at forest and wildlife development, protection and management. The details of assets created per range for all the forest divisions is as shown in the following table. Buildings, tube wells and cause-ways are found to have been created under CAMPA by all forest divisions. On an average, there are 18 different buildings, 6 causeways and 5 tube wells are created per each forest range in all the forest divisions. Culverts and water bodies are created by six out of seven



*Figure 5.2: Percentage of forest divisions creating the assets*

following table. Buildings, tube wells and cause- ways are found to have been created under CAMPA by all forest divisions. On an average, there are 18 different buildings, 6 causeways and 5 tube wells are created per each forest range in all the forest divisions. Culverts and water bodies are created by six out of seven



forest divisions (85.7% of the forest divisions). On an average 6 culverts and 18 water bodies are created per forest range. Overall, there are two nurseries per forest range. On an average there is 501 metres of compound wall per range. For wild life management, on an average there are 2 anti- poaching barracks per range in Berhampur division. The details of assets created under infrastructure development is shown in the table given ahead and chart given alongside.

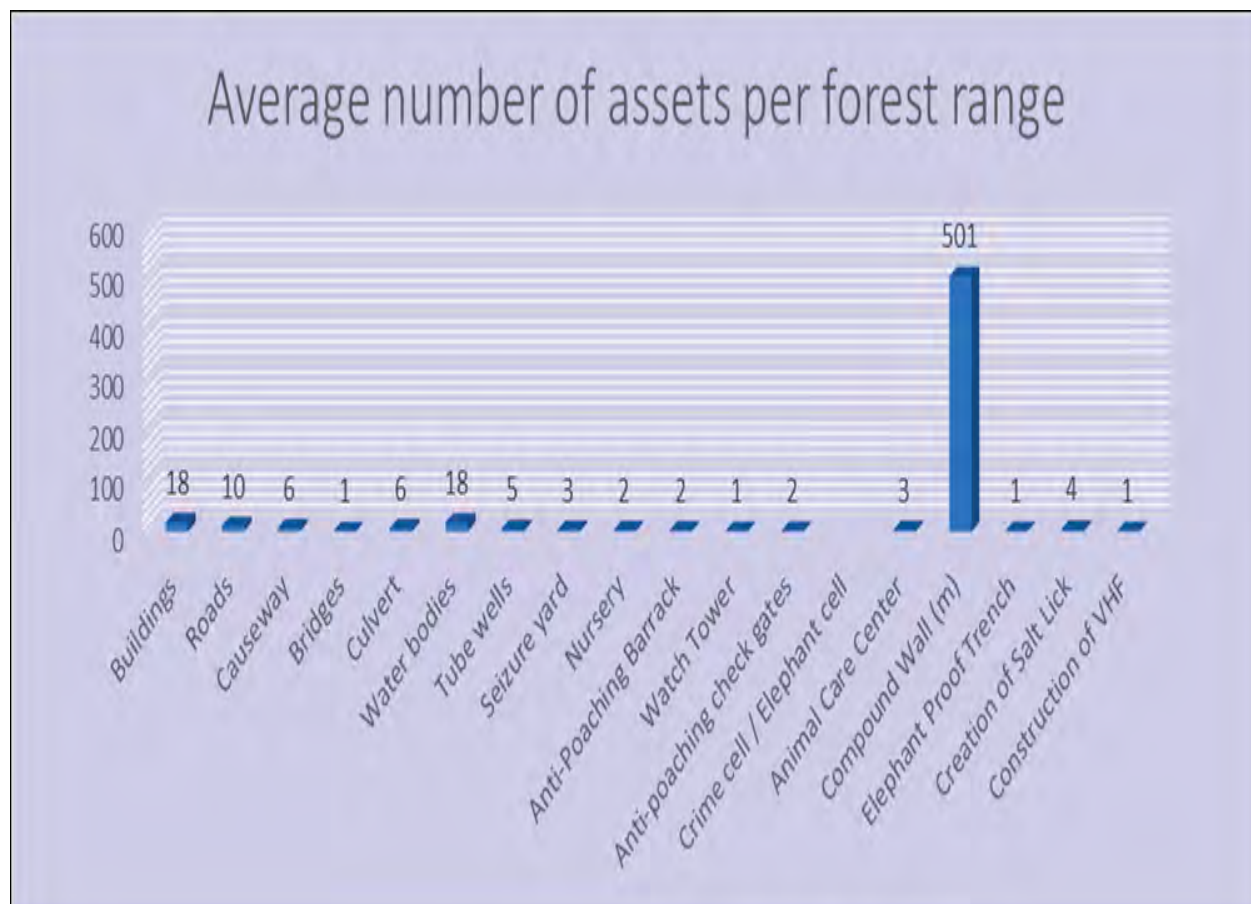


Figure : 5.3: Average number of assets per forest range

In order to assess the usability and current status of such assets, all assets were classified under i. building comprising of different type of buildings, ii. Tube-wells and Nursery, iii. Roads, bridges, causeways and culverts, iv. Seizure yards, Malkhana and other wild life management assets. Field verification of all such assets on sample basis were undertaken to assess the current status and usability of all such assets.

#### 5.16.1 Building

In order to assess the usability of buildings, a range of assets including Forester's quarter and office room, Forest range offices at different locations, Forest Guard quarters, Nursery shed, Forest squad quarter etc were verified on sample basis at different locations. In this process 20 different types of buildings were examined from the point of usability, facilities should have been available, facilities should be available and if there is any gap in output and outcome. As per the table (Usability of Buildings created under CAMPA Funds) given below, it is revealed that out of 17 type of buildings created under CAMPA, 11 buildings (about 64.7%) are currently being used, 4 buildings (23.5%) are being partially used, and the remaining 11.8 percent are either not used or improperly used. From the table given below it can be observed that





a ticket counter created under CAMPA funds at Govindapur beat, Podamari section, Chandragiri Range, Paralakhemundi Division, although having all amenities it is yet to be functional. It is viewed that such type of assets are futuristic assets created under CAMPA to smoothen future operations.

### 5.16.2 Nursery Activity

Nursery activity constitutes a vital infrastructure for carrying out plantation activities. Under CAMPA intervention, different type of nurseries like mega nurseries, Permanent nurseries, seedling yards were created at different places. For evaluating the performance and usability of such assets, four such assets as mentioned in the table given ahead (Usability of Nursery activity), were evaluated on sample basis. It was found that all types of nurseries created under CAMPA funds were found to be fully functional. Mega nurseries with 10 Acre area were found to be equipped with all facilities like seedling yard, water facility for irrigation as well as drinking water, overhead tanks, electricity as well as solar lighting provisions. In addition to raising seedlings and saplings for plantations, these nurseries also generate employment opportunities for the local people. However, in the seedling yards visited it was found that there were no water facility and journals about the seedlings and saplings were maintained.

### 5.16.3 Roads, Causeways and Culverts

For evaluating the usability of roads, causeways and culverts, four such assets were considered on sample basis. The sampled-out assets are detailed out in the table given ahead (Usability of Roads, Bridges, Cause ways and Culverts). It was found that out of four such sample assets, three assets (about 75 %) are currently fully functional and one asset (about 25%) are currently non-functional. The non-functional asset is an elephant proof trench created at T. Govindapur bit, Podamari Section, Chandragiri Range, ParalakhemeundiDivision which was found damaged. On the other hand, another elephant proof trench created under Mujagada range, Ghumsur(North) division was found to be fully functional. Owing to the requirement of such trenches in the identified areas, it is viewed that any damage to such assets should be repaired and the length of existing functional ones should be also be further extended. The road and causeways visited were found to have very good quality on the basis of desired outcomes from such assets.

### 5.16.4 Seizure Yard

Evaluation of seizure yard, Malkhana, Animal Rescue Centre (ARC) and other wild life management assets indicated that all such assets are currently being used. Similarly, the anti-poaching barracks are created at wrong locations. For instance, the Anti-Poaching Barrack (APB) at Gajalbadi(north) beat, Sorada range, Ghumsur (South) division is neither located inside forest areas nor located on forest pathways. It is located inside habitations. It is viewed that such APBs should be created on forest pathways. The Animal Rescue Centre (ARC) functioning inside Aska Range office compound is observed well-functioning and the said ARC has consistent focus for rescuing the black bucks, the famous specie of the local area.

### 5.16.5 Water Body

All the six waterbodies created under CAMPA at different locations were found to be fully functional. All the water bodies in addition to meeting drinking water requirements of animals, also become helpful for bathing requirements of the neighbourhood community as well as cattle. However, shortage of water during summer seasons ranging over four months is a common problem noticed in all water bodies. Sometimes, due to sleeper nature of waterbodies, it is suspected that wild animals may be facing



approachability problems to the water bodies created inside forest areas or adjacent to forest area. There should be separate pathways for wild animals and community people to approach the waterbodies. It is also suggested that as water in majority of water bodies are not available during summer months, so the depth of the waterbodies should be increased and more water may be conserved by collecting runoffs during rainy season so that water may be available round the year. It is viewed that there should be redesigning of existing water bodies and new waterbodies as per Wild life Management Plan.

*Table 5.27: Status of infrastructure development under CAMPA*

Name of Division	Division wise Number of Assets/ Range							All Divisions	% of divisions creating the assets
	Ghumsur North	Berha-mpur	Boudh	Paralekh-apundi	Baliguda	Ghumsur South	Phulbani		
Buildings	23	10	22	26	12	21	12	18	100.0
Roads	15	3	13					10	42.9
Causeway	6	2	2	6	5	14	10	6	100.0
Bridges		1						1	14.3
Culvert	3	1	2	3		24	5	6	85.7
Water bodies	42	18	7	26	12	2		18	85.7
Tube wells	4	3	2	11	1	9	6	5	100.0
Seizure yard	5	4	2		1	2		3	71.4
Nursery			1		4	3	1	2	57.1
Anti-Poaching Barrack		2						2	28.6
Watch Tower							1	1	14.3
Anti-poaching check gates		2				1		2	28.6
Animal Care Centre				3				3	14.3
Compound Wall (m)	355	150	450			1050		501	57.1
Elephant Proof Trench	1							1	14.3
Creation of Salt Lick	5			3				4	28.6
Construction of VHF	1							1	14.3





Table 5.28: Usability of Buildings

Sl. No	Site	Current Status	Type of Current Use	Quality of the asset	Impact of the asset	Suggestions	Scoring on the basis of usability and impacts	Ranking
1	Forester's Quarter & Office room, Dharakote Section, Aska Range, Ghumsur (South) Division	Residence of forest officer as well as section office	Two bed rooms, one kitchen, toilet, dining space, adjacent office, small corridor, water facility with boring.	Previously forest guard was staying in a damaged quarter now due to shift of forest officer to new quarter forest guard was shifted to the previously used quarter of forester.	Helped better supervision and implementation of forest activities.		8	High
2	Forest Range office, Aska	Being used	The old range office located at a congested place, now totally shifted to the new building. The new building is spacious and fully equipped with water, electricity, separate toilet facility, Hazat, Malkhana, dumping yard etc. An Animal rescue centre with veterinary Doctor facility inside the range office premises. Adjacent Ranger's quarter with all facilities like drawing, dining and two bedrooms with kitchen, water, and toilet facility	Good quality building. IT infrastructure is found poor due to non-appointment of computer personnel. Internet facility also not available	Availability instant information and database on CAMPA activities. It helped for suitable planning and review.	Internet facility should be made available.	9	High
3	Forest Range office, Sorada, Ghumsur (South) Division	Being used	Range Office	Excellent quality campus accommodating Ranger's quarter, a barrack for forest squads, a quarter for the watchman of the check gates, facility of hazat (male and female separately)	Facilitated smooth functions of Range Office and timely decision making and exercising responsibilities.	Internet facility should be made available.	9	High



Sl. No	Site	Current Status	Type of Current Use	Quality of the asset	Impact of the asset	Suggestions	Scoring on the basis of usability and impacts	Ranking
4	Forest Officer's Residence and office at Gajalbadi South Section, Sorada Range, Ghumsur (South) Division	Being Partially used	It is used for taking rest by the forest department people doing foot patrolling at day time and night patrolling.	It was observed that the building is well equipped with two bed room quarter, tiled floor, electricity and spacious compound. However due to non-availability of water, it is not fully used.	Helped forest protection squad for night patrolling as and when required.	Water facility should be created.	6	Medium
5	Forest Guard Quarter at Gajalbadi South Section, Sorada Range, Ghumsur (South) Division	Being Partially used	Partially used during daytime and for night patrolling	It is not serving its intended purpose, due to non-availability of water,	Promoted better office functioning and implementation of activities.	Water facility should be created.	6	Medium
6	Ranger's Quarter, Central Range, Ghumsur (North)	Being Used	Well maintained residence of Ranger with front garden.	Good quality of the asset observed.	Promoted better office functioning and implementation of activities.	Internet Facility should be made available.	9	High
7	Range office Building, Central Range, Ghumsur (North)	Being Used	water, washroom, Internet, electricity facility found available	Good quality asset, women hazat was used for store room purpose.	Promoted better office functioning and implementation of activities.	Best possible use should be ensured.	8	High
8	Nursery Shed, Baradaibili, Dharakote Section, Aska Range, Ghumsur (South) Division	Day time use (Being partially used)	Used by the labour force coming to the nursery during day time	Good quality asset owing to Electricity, water, toilet facility available. Facilities include One store room, one labour room, corridor one, Toilet, borewell, water tank,	S m o t h e n e d implementation of Nursery activities with availability of safe drinking water at the site level.	Permanent electricity required. The building should also be used for night stay purpose for departmental staff engaged for night patrolling.	8	High





Sl. No	Site	Current Status	Type of Current Use	Quality of the asset	Impact of the asset	Suggestions	Scoring on the basis of usability and impacts	Ranking
9	Range office Building, Paralakhemundi beat/ Section, Devgiri Range, Paralakhemundi Division	Being Used	Electricity, water, Computer Facility, Wash room, Hazat. Well furnished, good condition	Good quality asset owing to Electricity, water, toilet facility available.	Helped range officer for better plans and execution of departmental activities with available facilitating.	Good internet facility should be available.	8	High
10	Common Toilet, Puruna Cuttack beat/Section, Boudh Division	Being used	Electricity, Water, Hazat (male & female), toilet, computers, internet facility.	The range office was well maintained. However, there is no water supply to the office. Instead, a well present in the campus is used for fulfilling the water requirement.	Due to Separate toilet facility, road side toileting is reduced. Improved sanitation awareness among staff and visitors.	Water supply provisions should be created.	5	Medium
11	Pump house, Muzagada Range, Ghumsur (North) Division	Being used	Pump storage/ shelter	Closed room with lock, electricity should be available. Proper safety features found deficient.	Previously water fetched manually from open wells. So drudgery reduced and time saved.	Safety features required for pump house should be ensured.	3	Low
12	Watchman Shed, Muzagada Range, Ghumsur (North) Division	Improperly used.	The shed was found used for storage purpose rather than for stay of watchman	Although equipped with all required facilities, however, the asset does not serve its intended purpose.	Building used for storage purposes.	The building should be used for the staying purpose of the watchman.	3	Low



Sl. No	Site	Current Status	Type of Current Use	Quality of the asset	Impact of the asset	Suggestions	Scoring on the basis of usability and impacts	Ranking
13	Forest squad Quarter, Tarasingh beat, tarasingh range, Ghumsur (North) forest division	Being used	Used as transit residence.	water, Toilet, electricity etc available. Quality is observed good. The quarter was well maintained and was regularly cleaned	Used as transit residence of forest squads. Facilitated easy patrolling of squad as needed.		8	Good
14	Ticket Booking counter, T Govindapur beat, Podamari section, Chandragiri Range, Paraalkhemundi Division	Not used	Ready for use	Electricity, Ac, water facilities available. Well furnished, Ticket counter for the Deer Park	Yet to be functional.		3	Low
15	Range office. T Govindapur beat, Podamari section, Chandragiri Range, Paraalkhemundi Division	Partially used	The office is used seasonally	Water, Toilet, electricity etc available. Quality is observed good. However, due to non-availability of cooling arrangements, in summer the office can't function here. Owing to it, in summer season, the office continues to function from the old office building.	New range office building, which is additionally used during winter season.	There should be some cooling arrangements.	3	Low
16	Range Office, Puruna Cuttack Range, Boudh Division	Being used	The office is regularly taking place.	The office was well maintained and was regularly cleaned. There is separate hazat for male female with toilet facility	Helped smooth office functioning and exercising day to day office and field activity.	Cooling system may be made available.	7	Medium





Sl. No	Site	Current Status	Type of Current Use	Quality of the asset	Impact of the asset	Suggestions	Scoring on the basis of usability and impacts	Ranking
17	Ranger's Quarter, Puruna Cuttack Range, Boudh Division	Being used	The asset is appropriately used	Two bed rooms, one kitchen, toilet, dinning space, adjacent office, small corridor, water facility with boring found available and the residence was well maintained and was inside the office campus.	Improved social security the range officer and now due to quarter facility he is able to work more hours.		8	High

Table 5.29: Usability of Nursery

Sl.	Site	Current Status	Type of Current Use	Quality of the asset	Impact of the asset	Suggestions	Ranking	Ranking
1	Mega Nursery, Sidhipur Section, Badagada Range, Ghumsur (South) division	Being used	4 lakh saplings, seedling yard, compost pit, go down, overhead tank, store room, seizure yard, drawing yard, workstation, watchman shed	Sisoo, khaira, bamboo, bahada, amla, sal, piasal, sirisa, banabhalia, neem, guava, gangasuli, arju, kaitha, kara, imli, sitaphal etc. Significant employment generation (10+) on daily basis. Quality of asset is found very good	Ready availability of quality planting material		10	High
2	Seedling Yard, Muijagada Range, Ghumsur (North) division	Being used	Seedling storage	Watering facility not available. Journal is not maintained.	Availability of space proper storage and stock of seedlings.	A water body or tube well should be created for providing water to the seedlings.	8	High



Sl.	Site	Current Status	Type of Current Use	Quality of the asset	Impact of the asset	Suggestions	Ranking	Ranking
3	Permanent Nursery, Devagarh beat, Boudh Section, Boudh Range	Being used	Used as a permanent nursery and also for recreational purposes	Compound wall, Gate, Irrigation facility, Masonry & equipments, Labour shed, Watchman shed, Seed godown, seed treatment tank, drying yard, store house is found available. Huge land. Beautiful and well-maintained nursery. Capacity of the nursery is 5 lakh seedlings. But currently 1 lakh seedling was present. The nursery was well surrounded by concrete boundary wall and a gate. 2 perennial water body was created with motor for water supply to the seedlings. Tube-wells were also present. Solar lighting system was available inside the nursery. It is also developed as a recreational spot for the area.	Well maintained nursery catering the planting material requirements.		8	High
4	Mega Nursery, Baliguda beat, Baliguda Section/Range/Division	Being used	Nursery is found fully functional.	Compound wall, Gate, Irrigation facility, Masonry & equipments, Labor shed, Watchman shed, Seed godown, seed treatment tank, drying yard, store house, Mixing yard, seedling yard, Compost pit, compost godown, Vermi compost pit were found available at the site.	Well furnished nursery providing quality seedlings and other plantation materials.		10	High





Table 5.30: Usability of Roads, Bridges, causeways and Culverts

Sl.	Site	Current Status	Type of Current Use	Quality of the asset	Impact of the asset	Suggestions	Score on the basis of usability and impacts	Ranking
1	Causeway, Mujagada Section/Range, Ghumsur (North) Division	Being used	used for crossing the water body, and preventing soil erosion	An increase in drainage, has a 70m drainage channel, mixed into Kalakhonta drain.	Helped in checking soil runoff erosion.		10	High
2	Elephant Proof Trench, T Govindapur beat, Podamari section, Chandragiri Range, Paraalkhemundi Division	Not used	Damaged partially	This is a protection wall for the human Habitation, 3-meter height of Stone packing. It also maintains soil moisture and protect the soil erosion.	Improved soil moisture conservation and it also helped in protecting soil erosion.	It should be repaired.	6	Medium
3	Elephant Proof trench, Mujagada Range, Ghumsur (North) division	Being used	Preventing elephant movement into the adjacent village	Trench is hugely successful in limiting man-elephant conflict, no crop damage due to elephant since last two years.	Prevented elephant movement to adjacent villages and improved people security.	It would be beneficial if the elephant trench is extended further	8	High
4	Road, Baliguda section/Range/ Division	Being Used	Road connects the main road to the mega nursery	Road connects the main road to the mega nursery	Promoted better communication facilities and used all weather road by staff and villagers.	Condition of the road is observed good and, in all seasons, it could be used.	7	Medium



Table 5.31: Usability of seizure yards, Malkhana and other Wild Life Management assets

Sl.	Site	Current Status	Type of Current Use	Quality of the asset	Impact of the asset	Suggestions	Score on the basis of usability and impacts	Ranking
1	Anti-poaching shed, Gajalbadi-North beat, Sorada range, Ghumsur (South) division	Being used	Staying facility for anti-poaching squad at 1st floor, elephant squad (5 ppl) and ground floor for parking.	Toilet and temporary water facility. permanent electricity facility. However, Binocular, generators and necessary equipment's missing	Due to this shed/ barrack minimized the poaching and smuggling cases	Anti-poaching shed/ barracks should be located inside the forest rather than inside the habitation	10	High
2	Animal Rescue Center, Aska Range, Ghumsur (South) Division	Being used	Primarily for the rescue of Black bucks.	Proper fenced location, adequate green cover. However inadequate lighting and infrastructure for shade		Good, currently 3 black bucks are rescued.	10	High
3	Malkhana, Tarasingh Beat, Tarsingh range, Ghumsur (North) Division	Being used	Used to keep the seized forest produce.	Shed, electricity, proper lock system of malkhana. Wood, logs, bamboos, cement were kept in the malkhana. However, the area was not very clean.	Used as a storage space/room for keeping all seized goods.		8	High
4	Malkhana, Narayanpur-2 beat, Naryanpur Section, Mahindra Range	Being used	Red Sandal wood have been Seized and kept in the Malkhana.	Red Sandal wood was kept in the seizure yard in a haphazard manner.	Used as a storage space/room for keeping all seized goods.		8	High
5	Compound Wall, Muzagada (Range, Bhanjanagar Section, Ghumsur (North) Division.	Being used	Protecting the boundary.	Quality of assets observed good.	The construction of boundary wall protect and improves safety of office premises and building.		8	High
6	Seizure yard shed, Dengiguda beat, Kotagada Section, Tumudibandh Range, Baliguda Division	Being used	Used to keep seized good	Room, Gate and lock facility observed and quality of asset seems good. Seizure yard shed is a room with gate and lock. Cars were siezed and kept inside.	Used as a storage room for keeping all seized goods.		8	High





Table 5.32: Usability of Water Bodies

Sl.	Site	Current Status	Type of Current Use	Quality of the asset	Impact of the asset	Suggestions	Score on the basis of usability and impacts	Ranking
1	Waterbody, Baharpur Beat, Dharakote Section, Aska Range	Being Used	Necessary water supply, drinking water for wild animals like kutura & peacock, community bathing for four to five months in a year, water availability 10 months in a year and two months remain dry.	Good as water is available for major parts of the year and also very much helpful for drinking water purposes of wild animals.	Met the water requirement of wild animals for drinking and bathing purposes.	Depth should be increased so as to ensure water availability round the year.	10	High
2	Waterbody, Karadabadi Beat, Raipada RF, Sorada Range, Ghumsur South Division	Being Used	A old waterbody restructured by increasing the depth of waterbody. Multiple benefits in terms of water use by wild animals, bathing by neighbourhood community and life support irrigation to about 16 Acres of agricultural land due to surplus amount of water and also 50 house hold use water for drinking purpose. Peacock, rabbit, fox, wild boar, spotted deer do regularly come drinking water & wild boar come regularly come and peacock comes at afternoon every day. Previously wild animals entered into nearby community for water and it is stopped. However, forest dept. are extra conscious for hunters at the time of use of water by wild animals. Even in the month of march 8 feet of water is found available.	Excellent as it creates multiple benefits.	Met the water requirement of wild animals for drinking and bathing purposes.	A carefully constructed pathway for animals is felt urgent for the benefit of wild animals.	10	High



3	Water body, Narayanpur-II beat/ Section, Mahendra Range, Parala-khemundi Division	Being used	Used by wild animals and about 10 households of the neighbourhood community use it for regular bathing	Due to very much sloppy nature, approaching to the water body is felt risky and so quality of the asset is poor	Met the water requirement of wild animals for drinking and bathing purposes.	Animal pathway/ ramp need to be created.	10	High
4	Waterbody, Baring beat, Madhapur range, Boudh division	Being used	Used as a water source for animals as well as humans.	Excellent quality of the asset as Animals like Barking deer, Deer, Wild boar often come to the pond in morning and evening for drinking. 30-40 families depend on the water body for bathing and cleaning purpose. Truck drivers also use the pond for washing of the vehicle as it is located along roadside. It was created under CAMPA wild life fund.	Met the water requirement of wild animals for drinking and bathing purposes.		8	High
5	Waterbody, Malangi beat, Kurtamguda Section, Baliguda Range/ Division	Being used	Used by wild animals as well as human beings.	Seasonal water body. Dry in summer. Leopard, barking deer, bear come for drinking. People use for bathing. Last year people used for fishing and fish farming.	Met the water requirement of wild animals for drinking and bathing purposes.	More water may be conserved by collecting runoffs during rainy season so that water may be available round the year.	8	High
6	Waterbody, Simanbadi beat,	Being used	Used as a water source for animals as well as humans	Village uses the surplus water for agriculture. Basically, used for animal (Bear, barking deer, Wild boar, Rabbit, Porcupine) drinking purpose. Seasonal water body.	Met the water requirement of wild animals for drinking and bathing purposes.	Water is not available during winter and summer.	10	High





## 5.17 Vehicles purchased

Under CAMPFA implementation, vehicles were purchased for ensuring smooth mobility of departmental people for protection and management of forest resources. Similarly, number of equipment for fire protection and general maintenance of forest resources, varieties of equipment including fire blowers are purchased. Number of vehicles and equipment purchased per range for all of the forest divisions is provided in the following table. It is observed that 4 vehicles are purchased per range in Boudh and Ghumsur (South) division. Vehicles purchased is not reported in the sampled-out ranges of Baliguda and Berhampur division. The vehicle purchased per range for Phulbani, Paralakhemundi and Ghumsur (North) is found at 3, 2 and 2 numbers respectively. During evaluation, the log books were verified and it was found that all the vehicles are properly maintained and managed.

*Table 5.33: No of vehicles and equipment purchased under CAMPFA*

Division	Total no of Vehicles purchased/ hired	Total no of equipment's purchased
Baliguda		
Berhampur		
Boudh	4	
Ghumusur North	2	373
Ghumusur South	4	24
Parlakhemundi	2	13
Phulbani	3	18

## 5.18 Ama Jungle Yojana

In order to assess the performance of AJY, three VSSs under Paralakhemundi, Phulbani and Baliguda divisions supported under AJY were evaluated. FGDs were separately conducted with the selected VSSs. The details of those VSSs are furnished in the following table-5.34.

*Table 5.34: Sample out VSSs supported under AJY*

Sl.	Name of the VSS	Village	Beat	Section	Range	Division	No of VSS members attended the FGD Meeting		
							Male	Female	Total
1	Bidua VSS	Bidua	Bidua	Paralakhemundi	Devagiri	Paralakhemundi	9	3	12
2	Rabinkia VSS	Rabinkia (Thesra Jungle)	Rabinkia	Nuapadar	Phiringia	Phulbani	10	0	10
3	Tilory VSS	Tilory	Tilory	Budaguda	Simanbadi	Baliguda	8	4	12

### 5.18.1 Awareness of VSS members about AJY:

During discussion with the VSS members it was found that they were very much aware about CAMPFA and the VSS members of Bidua and Rabinkia were also involved in different phases of CAMPFA implementation



starting from the preparation of micro plans. However, the VSS members of Trilory were aware about CAMPA but had not participated in preparing the micro plans. Regular meetings of VSS people with forest department personnel is reported at Bidua and Rabikia villages. On the other hand, it is also said by the participants that forest department people undertake awareness generation programmes in all the villages. After several attempts of convincing by the forest department personnel, now, few of the VSS members of Trilory village are found well convinced about CAMPA. As a matter of fact, these convinced people were instrumental in convincing the merits of AJY to other groups of people. Now the situation is found almost stabilized in all the villages. This indicates that forest department has undertaken sincere efforts for convincing the VSS members about implementation of CAMPA and its benefits on community members. The details of involvement of VSS members in day to day functioning AJY is as shown in table-5.35.

*Table 5.35: Type of involvement of members in the day to day functioning of AJY*

Type of functioning	Bidua VSS, Paralekhamundi Division	Nuapadar VSS, Phulbani Division	Tilory VSS, Baliguda Diviison
Functioning of VSS/ JFMC prior to AJY in the village	Yes	Yes	Yes
Awareness about process and practice of CAMPA	Yes	Yes	No
Micro Planning before CAMPA intervention	Yes	Yes	No
Involvement of VSS members at various stages	Yes	Yes	No
Regularity of Meeting	Yes	Yes	No

### 5.18.2 Involvement of VSS members at Various Stages of CAMPA implementation:

The VSS members of Bidua VSS and Nuapadar VSS were involved in project planning and implementation by preparing required micro plans. On the other hand, the members of Tilory VSS were not involved. However, with respect to sharing of resources, all of the three VSSs were found active in decision-making. The VSS meetings are regularly conducted at Bidua and Nuapadar, but rarely conducted at Tilory. There is better members' attendance in regular meetings conducted by Bidua VSS compared to Nuapadar and Tilory VSS.

*Table 5.36: Type of involvement of members in the day to day functioning of AJY*

Type of functioning	Bidua VSS, Paralekhamundi Division	Nuapadar VSS, Phulbani Division	Tilory VSS, Baliguda Diviison
Project Planning	Yes	Yes	No
Project Implementation	Yes	Yes	No
Sharing of resources	Yes	Yes	Yes
Whether any special Gram Sabha and VSS/JFMC meetings held?	Yes	Yes	Rarely





Type of functioning	Bidua VSS, Paralekhamundi Division	Nuapadar VSS, Phulbani Division	Tilory VSS, Baliguda Diviison
How frequent a JFMC meetings held in a month?	Always	Always	Rarely
How is the attendance/participation of the members in the meetings?	Good	Average	Average
Whether any awareness programmes were held in your area on the practices of CAMPA?	Yes	Yes	No
Has the forest cover/plantation area increased/decreased under the CAMPA project?	Improved	Improved	Not changed
Maintenance of VSS register:	Properly maintained	Properly maintained	Not maintained
After how many days the wage payment was made when the work is being done?	Weekly	Fortnightly	Fortnightly
Mode of Payment:	Cash	Cash	Cash

### 5.18.3 Impacts of AJY on Forest Protection and Livelihoods Pattern:

The members of Bidua VSS are of the opinion that the gram sabha meetings in their village is held on 1st of every month in which 70-80% members attend and take part actively. They have properly maintained their VSS registers. They receive weekly wage payment in cash for the works they do in the CAMPA forests. They think that CAMPA has led to an improvement in forest cover but they mentioned that before CAMPA they had Kaju and Mahua in the forest nearby but under CAMPA these trees were replaced with Teak, Ghambari, Kendu and Chara. For the protection of these forests, no special measures were used. Fire incidences in the plantation sites have significantly reduced to negligible despite of the fact that podu cultivation is still practiced by them. In these forests they are allowed to use the forest produce and also in some patches they started growing Kaju, Mango, Kandula and Jhadu. Similarly, during FGD, the members of Nuapadar VSS stated that there has been improvement in forest cover after CAMPA implementation and tree species like Sal, Pedia Sal, Bahada, Mahula, Sahaja and Ghambari etc. They have also mentioned that there is no record of forests fire incidents owing to



abandonment of podu cultivation in their area. They acquire Kendu leaves, Mahula, Mango, Bhalia and Jackfruit from the forests and these are adding value in their daily wages. They acquire Kendu leaves, Mahua, Mango, Jackfruit and Cashew from the forests and these are adding value in their daily wages. They also mentioned that there have no or very insignificant improvement in number of wild life in the nearby forest there is no record of human-wildlife conflict in their area. Most commonly seen fauna species in their area are Kutura, Spotted deer and wild boar. The members of Tilori VSS indicated that they were not sure if there has been any improvement in forest cover after the CAMPA intervention as there is not much visual changes in the forest cover. The villagers collect various NTFPs from these forests which adds to their income generation process. Some of the collected forest produce are Haida, Bahada, Amla, Sialipatra, Sal patra, Mahua, Chara, etc. which have significant market value. Due to non-practice of podu cultivation by the community members, incidences of forest fire is reduced. The members of Tilori VSS stated that they were not satisfied with CAMPA interventions because there have been nil or very insignificant improvement in forest cover and animal sightings. They even mentioned that the hyenas and wolfs in the forest eat their goats and hens which exacerbated human animal conflict in the region. The perception of the VSS members regarding the impacts of CAMPA is as mentioned in the following table. They also mentioned that there have no or very insignificant improvement in number of wild life in the nearby forest there is no record of human-wildlife conflict in their area. Most commonly seen fauna species in their area are Kutura, Spotted deer and wild boar. The members of Tilori VSS indicated that they were not sure if there has been any improvement in forest cover after the CAMPA intervention as there is not much visual changes in the forest cover. The villagers collect various NTFPs from these forests which adds to their income generation process. Some of the collected forest produce are Haida, Bahada, Amla, Sialipatra, Sal patra, Mahula, Chara, etc. which have significant market value. Due to non-practice of podu cultivation by the community members, incidences of forest fire is reduced. The members of Tilori VSS stated that they were not satisfied with CAMPA interventions because there have been nil or very insignificant improvement in forest cover and animal sightings. They even mentioned that the hyenas and wolfs in the forest eat their goats and hens which exacerbated human animal conflict in the region. The perception of the VSS members regarding the impacts of CAMPA is as mentioned in the following table-5.37.

*Table 5.37: Members' Perception on various impacts of CAMPA Aided AJY*

Mode of protection of plantation	Rules and Regulations	No protection	Ward and Watch
Frequency of fire incident in the plantation site	Never	Never	Never
Practice of Podu cultivation in the plantation site	Yes	No	No
Collection of forest produce?	Yes	Yes	Yes
Benefits obtained from the plantation site (Type of items collected from the Forest)	Kaju	Kendu	Saili Patra
	Mango	Mango	Mahula
	Kandul	Mahula	Amla
	Jadhu		Sal Patra
Satisfaction with the works done under CAMPA?	Yes	Yes	No
Training Programme for the VSS members	No	Yes	No
Increase in the number of wild animals due to CAMPA initiated AJY	No	No	No
Mitigation plan for human wildlife conflict?	No	No	No
Role of CAMPA in reducing distress migration of village people	Yes	No	No
Frequency of human animal conflict	Never	Never	Rarely
Change in the water level	Same	Same	Same





## 5.19 Summary of Findings

- Block plantation is reported in all the forest divisions except Baliguda forest division. Similarly, bald hills plantations is taken up only in Berhampur and Ghumsar (South) forest divisions.
- Out of seven forest divisions, compensatory afforestation is implemented only in three forest divisions- Berhampur, Ghumsar south and Paralakhemundi forest divisions.
- Except OWP plantation, net area as percentage to gross area is more than 95 percent for all plantation activities. With respect to avenue plantation on an average for about 4 kms length, 10000 saplings are planted.
- On an average 1594.4 hectares of Gross Forest Area and 1550.5 hectares of net area per forest range is covered under CAMPA implementation. Compared to all forest divisions under Berhampur circle, maximum net forest area to the extent of 1410.0 hectares per range in Baliguda division is covered under ANR plantation.
- Taking into account all types of plantation sites, the average area of the plantation sites is found to be the highest at Baliguda division and lowest at Ghumsar (North) division.
- Plantation journals are maintained by all the sample ranges under all forest divisions for undertaking new plantation activities. Plantation registers are maintained for ANR without Gap and Subsidiary silviculture operations.
- Plantation maps are prepared for all types of plantations for all divisions.
- Treatment maps are prepared by all the divisions only for ANR type of activities. For direct plantation activities
- As per forest department officials', teak, acacia, Chakundi and Karanja have better survival rate under dry deciduous type of forests found in Berhampur circle.
- There are some random variations in the height and GBH/GCH according to the age of plantation. Perhaps these are influenced by the variability of soil and micro climatic situations across different forest ranges of Berhampur subdivision.
- The overall casualty is only 4.5 percent which is found higher to the extent of 8.5 percent for compensatory ANR with gap plantation and Paralakhemundi division witnessed more casualty relative to other forest divisions.
- It was observed that most of the plantation sites have pillar installed along the plantation area. All the pillars posted were found to be geo-tagged. Out of seven forest divisions, regeneration of timber is undertaken in four forest divisions, silvicultural operations are undertaken in three forest division. OWP revenue is done only in Paralakhemundi division. Conservation of old teaks plantations and economic species are done in Berhampur and Ghumsar South forest divisions. Except Baliguda division, regeneration of bamboo forests is undertaken in all of the forest divisions.
- Taking note of average amount of siltation in all type of SMC structure is to the extent of 47 percent and the average depth of different type of trenched is 18 CMs, it may be said that due to SMC structures, soil erosion is prevented.
- On an average, 494 kms of Fireline is prepared per forest range. In some selected ranges under Berhampur and Ghumsar (North) forest divisions, local JFM's were involved for forest protection. There are about 64 para staff per range employed for forest protection.
- In addition to general protection measure, watch and word with the involvement of local people is a major forest protection measure.



- There were 7 poaching cases registered per range under all forest divisions. Similarly, per range 21 wild were rescued and rehabilitated and per range 11 people were arrested due to their involvement of poaching of wild birds/animals.
- Incidence of human animal conflict is found higher at Boudh division followed by Ghumsur north division. There were about 11 human animal conflict cases per range were reported in Boudh division.
- Cattle immunisation camps have positively contributed to contain the incidence cattle disease.
- VSS members under AJY are found involved in project planning, project implementation and sharing of resources. Meetings were held with the forest departments frequently to spread awareness among the locals about CAMPA.
- Forest department officials have undertaken sincere efforts for convincing the VSS members about implementation of CAMPA and its benefits on community members.
- It is found that creation of boundary wall is undertaken in 2 out of 3 sacred groves. Boundary wall and plantation of trees are created in 1 out of 3 sacred groves.
- Entry point activities are not focussed in CAMPA APOs. However, it is implemented at limited number of sites of three forest divisions- Baliguda, Berhampur and Ghumsur (North) forest divisions.
- Number of training programmes per range is found minimum at Berhampur and Paralakhemundi division as against maximum number of training programmes at Baliguda division followed by Boudh division.
- On an average there are 2 computers and 4 computer literate people per range. Out of 4 computers available, 2 computers are to be found functioning. There are 9 GPS devices and 4 PDA machines available per range.
- With respect to infrastructure development, on an average, there are 18 different buildings, 6 causeways and 5 tube wells are created per each forest range in all the forest divisions. Culverts and water bodies are created by six out of seven forest divisions (85.7% of the forest divisions).
- On an average 6 culverts and 18 waterbodies are created per forest range. Overall, there are two nurseries per forest range. On an average there is 501 metres of compound wall per range. For wild life management, on an average there are 2 anti- poaching barracks per range in Berhampur division.
- On an average 4 vehicles are purchased per range in Boudh and Ghumsur (South) division. Vehicles purchase is not reported in the sampled-out ranges of Baliguda and Berhampur division.
- The vehicle purchased per range for Phulbani, Paralakhemundi and Ghumsur (North) is found at 3, 2 and 2 numbers respectively. During evaluation, the log books were verified and it was found that all the vehicles are properly maintained and managed.

## 5.20 Suggestions for Improved Performance

### 5.20.1 Plantation Activities

- After initial years of CAMPA APOs and particularly after the 2013-14, more emphasis under subsequent APOs was accorded to infrastructure development. It is viewed that plantation activities should have same importance as it constitutes the basic of CAMPA implementation programme.
- All types of plantations carried out under CAMPA should have some community involvement as done under AJY for better protection of plantation and also livelihood generation of the villagers.





- For ensuring better forest balance, more priority may be accorded to Indigenous species rather than foreign species for plantation.
- It is found that under CAMPAs intervention, there is consistent focus for timber trees and fruit bearing trees are not given any priority. As fruit bearing trees are also important from the point of livelihood generation of local people and such type trees are generally well preserved by the people, so fruit bearing plants or species should be accorded priority under CAMPAs enabled Plantation programmes.
- As it is observed that plantation maps are not maintained for all types of plantations in all the forest divisions, it is suggested that plantation maps should be prepared for all plantation activities under CAMPAs with necessary geotagging.
- There should be fresh plantation and creation of tube wells in all the sacred grove sites.

### 5.20.2 Other Than Plantation Activities

- Towards better forest protection and management, watch and ward and all other general protection measures should continue even after the fund flow has stopped.
- Towards social mobilisation of CAMPAs intervention and greater community involvement for forest protection and management, focus should be given towards creation of EPAs in forthcoming CAMPAs APOs of all forest divisions.
- Internet facility should be ensured at all range offices. Now due to relocation of many of the range offices as a result of CAMPAs promoted new buildings, frequent internet problems are reported in many of the ranges like Aska, Sorada, Badagada etc.
- The usability of some of the buildings created under CAMPAs like forester's office-cum residence and forest Guard's residence are just not usable owing to non-feasibility of creating water facility. While creating assets and usability of such assets, water, electricity and other basic facility should be well planned for ensuring the usability of the buildings.
- Sometimes assets are created without assessing its demand. For instance, the Watchman Shed, Muzagada Range, Ghumsur (North) Division created under CAMPAs is used as store room instead of staying purposes of the watchman.
- Anti-poaching shed/ barracks should be located inside the forest rather than inside the habitation.
- While designing water bodies, a carefully constructed pathway for animals coming to the water body for drinking purposes, may be considered. A proper animal pathway should be created in those water bodies which are used by animals as well as human beings.
- Under farm forestry, seedlings are distributed to farmers. As per the suggestions of forest officials, in addition to seedlings, tree guards should also be provided so that causality of plants at farm forestry level could be prevented.
- The assets created out of CAMPAs funds, which are currently damaged, there should be provision of repairing of those assets with suitable provision in the forthcoming APOs of the concerned forest divisions.



## 5.21 Satellite Imagery of Sample Plot



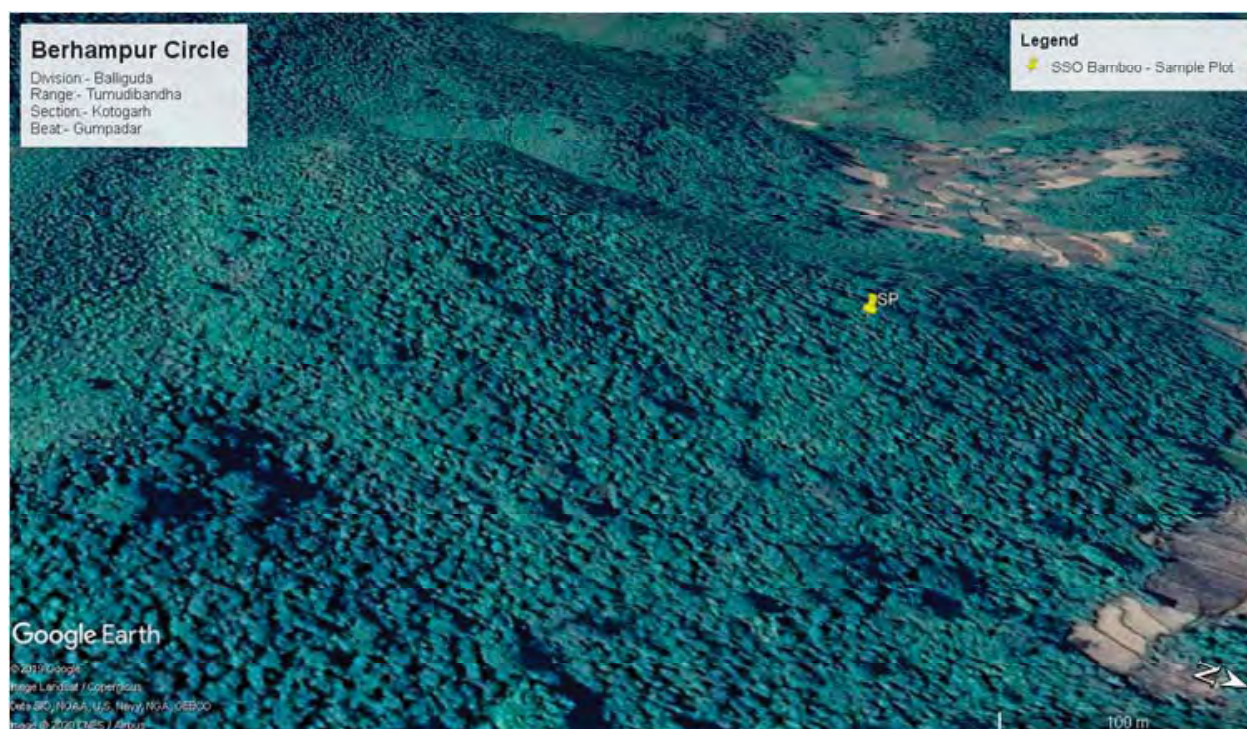




















## CHAPTER - VI







## 6. Evidence of CAMPA implementation in Bhawanipatna Circle

Bhawanipatna forest circle came in to force with effect from 01.10.2003 after re-organization of Forest Department. There are six Forest Divisions namely Kalahandi North, Kalahandi South, Bolangir, Khariar, Subarnapur, Sunabeda (WL) and one Working Plans Division functioning in Bhawanipatna. The Jurisdictions of this circle office are covering to the districts of Kalahandi, Bolangir, Sonepur, and Nuapada and partly Koraput district due the existence of Sunabeda W/L division in this division. The forest type prevailing in this circle corresponds to “moist and dry deciduous” type of forests. During the period 2009-10 to 2016-17, a number of CAMPA supported activities were undertaken separately by all of the forest divisions of this circle. Present chapter seeks to establish evidences of CAMPA intervention by analysing outcome performances of all types of assets created under CAMPA. With this purpose, on sample basis different plantations as well as non-plantations assets from three selected forest ranges of each of the forest divisions under Bhawanipatna circle were evaluated during the period October 2019 to January 2020. The succeeding sections analyses the outcome performance of plantation activities and outcome performance of other than plantation activities also.

### 6.1 Sample coverage of Plantation related activities

The study covers nine different types of plantation related activities including SSO activities. For Sunabeda W/L division, Fruit bearing plantation (Fodder Plantation) is also considered as sample. Altogether there are 39 plantation sites and for these sample sites. 104 sample plots as per the plot scheme mentioned in Chapter-1, are taken into consideration. On an average there are 3 plots per sampled out plot. The sample out plantation sites are located in 18 forest ranges under six forest divisions including Sunabeda W/L division of Kalahandi circle.

*Table 6.1: Sample Coverage of Plantation related Assets*

Sl.	Type of Plantation	Divisions	No. of sites	Total No. of Plots
A	AJY Block plantation	Kalahandi North	1	1
		Khariar	1	1
B	ANR with Gap	Balangir	5	15
		Kalahandi North	3	12
		Kalahandi South	3	17
		Khariar	2	9
		Sonepur	3	11
C	Avenue Plantation	Kalahandi South	1	2
D	Bald Hill Plantation	Kalahandi North	3	3
		Kalahandi South	1	2
		Khariar	3	3
		Sonepur	2	2
E	Block plantation	Balangir	2	7
		Kalahandi South	1	2
		Kalahandi North	1	2
F	Fruit Bearing Plantation (Fodder Plantation)	Sunabeda Wildlife	1	1
G	Old Teak management	Kalahandi South	1	1



Sl.	Type of Plantation	Divisions	No. of sites	Total No. of Plots
H	OWP	Sonepur	1	G1
I	SSO Bamboo	Kalahandi North	1	5
		Khariar	1	5
		Sonepur	1	5
		<b>Grand Total</b>	<b>39</b>	<b>104</b>
	<b>No of Plots per plantation site</b>			<b>3</b>

Table 6.2: Sample Coverage of Divisions and Ranges

Sl.	Division	Ranges
1	Sunabeda WL	Sunabeda WL
2	Khariar	Khariar
		Komna
		Nuapada
3	Sonpur	Sonpur
		Birmaharajpur
		Ulunda
4	Kalahandi (South)	Karlapat
		T. Rampur(N)
		T.Rampur(S)
		Jaipatna
		BN.Pur
5	Kalahandi(N)	Kegaon
		Kesinga
		Bhwanipatna
6	Bolangir	Harisankar
		Patnagarh
		Bolangir
		<b>Total</b>

There are about 110 assets other than plantation activities created under CAMPA are evaluated in all of the six forest divisions under Kalahandi Forest Circle. These sample assets are under 32 types of assets. Major coverage of assets includes Forest Guard Quarter, Range Office Buildings, Forester Quarters, Staff Barracks, Water Bodies and Seizure Yards.





Table 6.3: Sample coverage of other than Plantation Assets

Sl.	Component	Number of assets sampled out by divisions						
		Sunabeda W/L	Khariar	Sonepur	Kalahandi (South)	Kalahandi (North)	Bolangir	All Divisions
1	Forest guard quarter	0	3		3	3	3	12
2	Forester quarter	1	1	2	3	1	1	9
3	Range office	1	1	2	2	3	1	10
4	Residence of Ranger	0	1	2	1	2	1	7
5	Staff Barak	2	1	3	1	2	0	9
6	Causeway	1	0	0	0	2	1	4
7	Common Toilet	0	0	0	1	1	0	2
8	Culvert	1	0	0	0	2	1	4
9	Small bridge	0	0	0	0	0	0	0
10	Nursery	1	0	1	0	1	0	3
11	Secret Grove	0	0	0	2	0	0	2
12	Seizure Yard	1	0	0	0	0	1	2
13	Malkhana	2	1	2	3	0	0	8
14	Boundary well	0	0	0	2	0	1	3
15	Water body	3	2	2	1	1	1	10
16	VHF Tower	0	0	0	2	0	0	2
17	Salt lick	1	0	0	1	0	0	2
18	Forest Road	0	0	0	1	0	1	2
19	Tube well	0	0	0	1	0	0	1
20	Protection squad	1	0	0	2	0	0	3
21	Para staffs	0	0	0	0	1	0	1
22	LBCD	0	0	0	1	0	0	1
23	Check Dam	0	0	0	1	0	0	1
24	Wooden Bridge	0	0	0	1	0	0	1
25	CC Road	0	0	0	1	0	0	1
26	Earthen Bound	2	0	0	1	0	0	3
27	Post mortem Shed	0	0	0	0	1	0	1
28	Treatment Shed	0	0	0	0	1	0	1
29	Gate operating house	1	0	0	0	0	0	1
30	Solar Fencing	1	0	0	0	0	0	1
31	Meadow development	1	0	0	0	0	0	1
32	Elephant Trench	0	0	1	0	0	0	1
	<b>Total Circle</b>	<b>20</b>	<b>10</b>	<b>16</b>	<b>31</b>	<b>21</b>	<b>12</b>	<b>110</b>



## 6.2 Year wise intervention

The sampled-out plantation sites are created during the period 2009-10 to 2016-17. Out of the total plantation sites, majority of plantation activities are created in the year 2015-16 followed by 2016-17 and 2014-15.

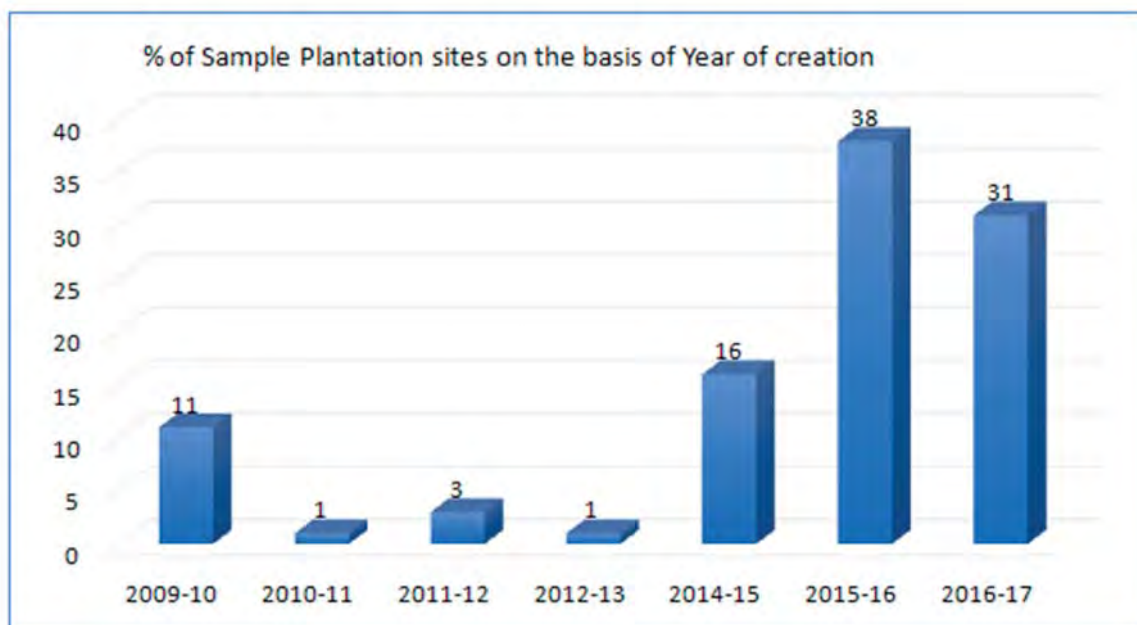
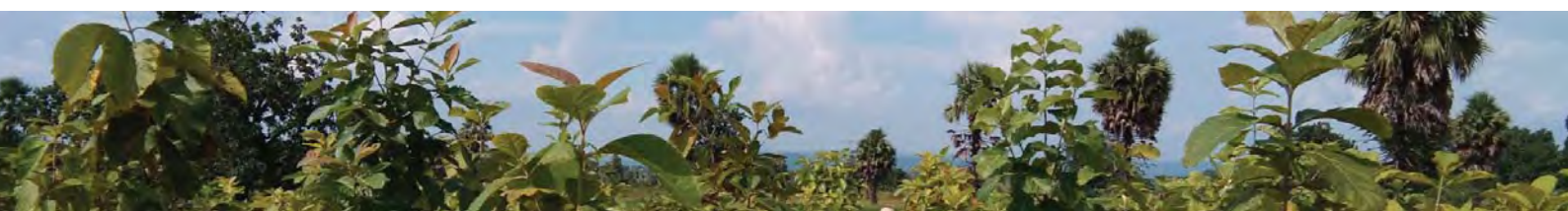


Figure 6.1: Percentage of Sample Plantation sites on the basis of year of creation

Table 6.4: Year wise creation of Plantation Assets

Type of Plantation	% of Plantation Sites							Grand Total
	2009-10	2010-11	2011-12	2012-13	2014-15	2015-16	2016-17	
Block plantation					-	0	100	100
ANR with Gap					33	67	0	100
Avenue Plantation	100	0	0	0	0	0	0	100
Bald Hill Plantation	0	0	20	0	0	0	80	100
Block plantation	82	9	9	0	0	0	0	100
Fruit Bearing Plantation	0	0	0	0	0	0	100	100
Old Teak management	0	0	0	100	0	0	0	100
OWP	0	0	0	0	0	100	0	100
SSO Bamboo	0	0	0	0	0	67	33	100
<b>Grand Total</b>	<b>11</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>16</b>	<b>38</b>	<b>31</b>	<b>100</b>





## 6.3 Assessment of outcome Performance of AR Plantation Activities

### 6.3.1 Average area of Plantation sites

The average area of avenue plantation is expressed in RKM and for the remaining plantation categories it is expressed in hectares. The average length of avenue plantation is found at 25 kms. For the remaining sample plantation activities, the average area under plantation is calculated at 22.2 hectares. Compared to the overall average area of plantation, the average area under block plantations is found higher.

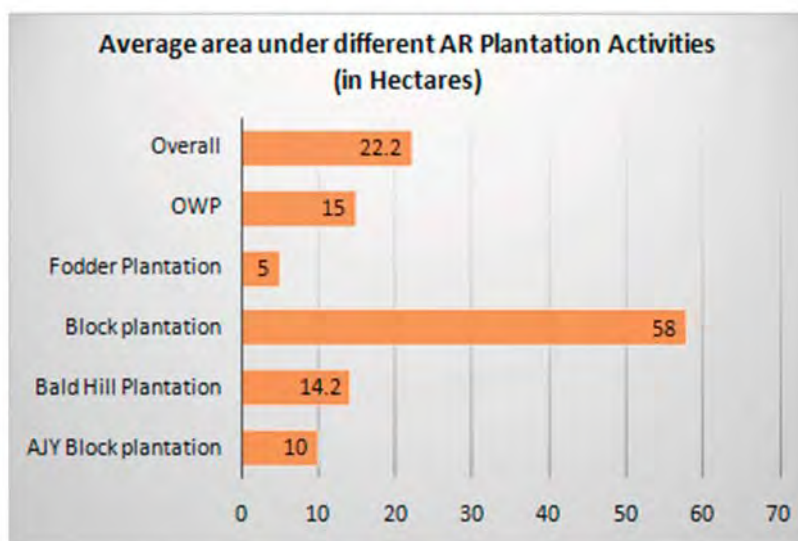
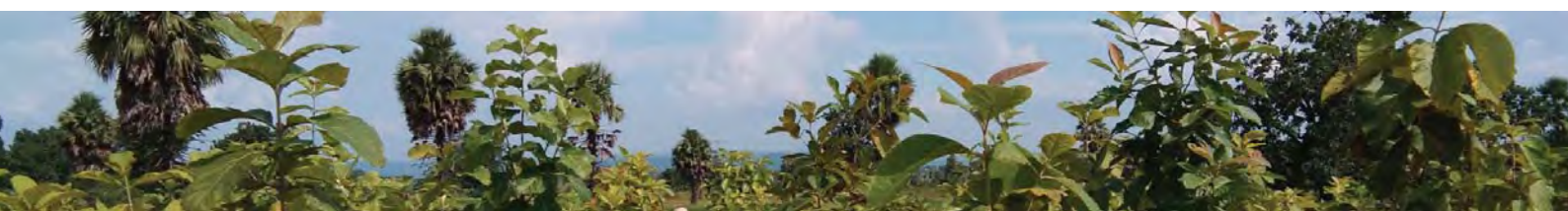


Figure 6.2: Average area under different AR Plantation Activities (in Hectares)

Table 6.5: Average Area under AR Plantation sites

Sl.	Type of Plantation	Divisions	Average of Area of the site (Ha)/ RKM
A	AJY Block plantation	Kalahandi North	10.0
		Khariar	10.0
		Total	10.0
B	Avenue Plantation	Kalahandi South	25.0
C	Bald Hill Plantation	Kalahandi North	11.7
		Kalahandi South	30.0
		Khariar	5.7
		Sonepur	15.0
		Total	14.2
D	Block plantation	Balangir	77.1
		Kalahandi South	9.0
		Khariar	40.0
		Total	58.0
E	FRUIT BEARING PLANTATION (Fodder Plantation)	Sunabeda Wildlife	5.0
F	Other than Working Plan Plantation	Sonepur	15.0
	Overall Avenue Plantation		25 RKM
	Overall Plantation Activities		22.2 Hectares



### 6.3.2. Species Diversity and Intensity

The species diversity under CAMPA created plantation sites is arrived at by counting all types of trees available on plantation sites and intensity of such trees is arrived at by considering number of trees per 10000 trees. It is found that there are about 33 varieties of different species witnessed in all types of plantations evaluated. Intensity of teak is found to be the maximum and there are about 5303 teak trees for every 10000-tress planted under CAMPA. Teak is followed by Khaira, Bamboo, Sisoo, and Badachakunda, Neem, Amla, Gambhari and Sanachakunda. These are 10 major species covered under CAMPA AR plantation.

*Table 6.6: Diversity and Intensity of trees under AR Plantation.*

Sl.	Tree Diversity	No of trees witnessed	Intensity of trees
1	Teak	5423	5302
2	Khaira	1028	1005
3	Bamboo	689	674
4	Sisoo	512	501
5	Badachakunda	486	475
6	Neem	437	427
7	Karanja	235	230
8	Amla	190	186
9	Gambhari	187	183
10	Sanachankunda	160	156
11	Dhaura	122	119
12	Bheru	111	109
13	Arjuna	94	92
14	Balai	93	91
15	Babul	90	88
16	Cashew	65	64
17	Kendu	54	53
18	Bahada	42	41
19	Gangatentuli	42	41
20	Simaruba	39	38
21	Sirisa	29	28
22	Funfana	18	18
23	Bela	16	16
24	Acacia auriculiformis	15	15
25	Krushnachuda	10	10
26	Chatiyan	9	9
27	Sunari	8	8
28	Jamun	7	7
29	Tamarind	7	7
30	Mahaneem	4	4
31	Neem	4	4





Sl.	Tree Diversity	No of trees witnessed	Intensity of trees
32	Phasi	2	2
	Total	10228	10000

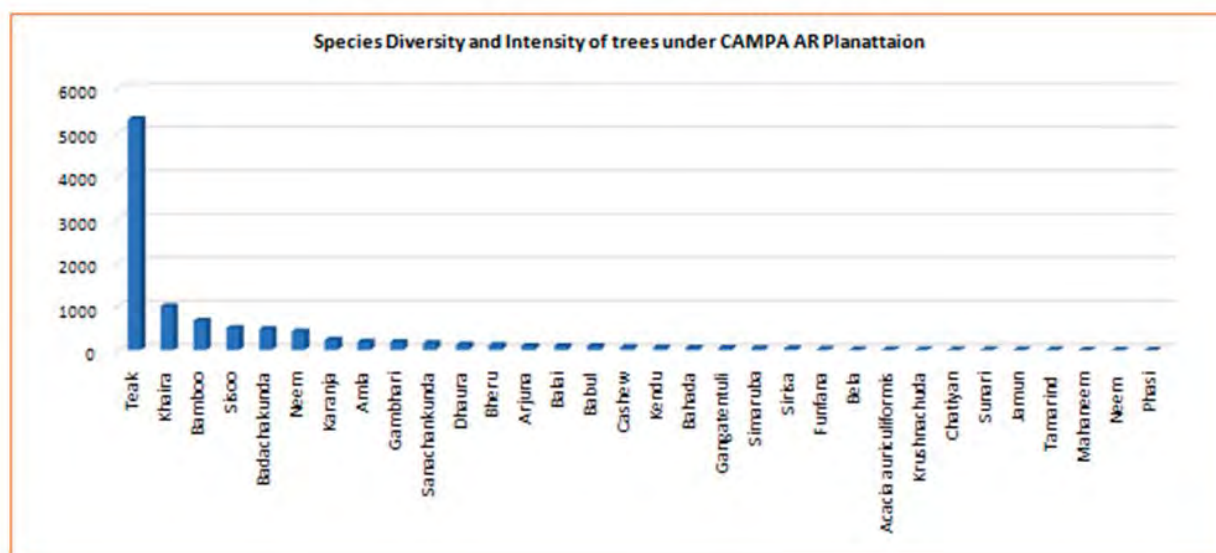


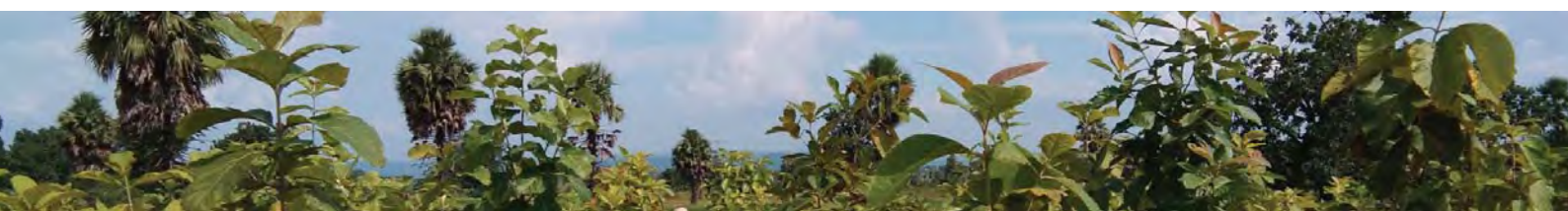
Figure 6.3: Species Diversity and Intensity of trees under CAMPA AR Plantation

### 6.3.3 Survival and Casualties of trees

Survival and casualties of trees for different plantation conditions as summarized in the following table reveal that on the basis of survival rate the performance of AJY plantation, bald hills plantation is found 'high'; the performance of block plantation and OWP plantation is found 'medium' and the performance of avenue plantation is 'low'. The overall performance of Kalahandi circle in AR Plantation, taking note of survival rankings is found 'medium'.

Table 6.7: AR Plantation performance on the basis of survival and Casualties

Sl.	Type of Plantation	Divisions	Survival and Casualty of trees / Hectare of Plantation					
			Average No. of surviving trees (Hectares /RKM)	Average no of casualties of trees	Total	Causalityrate (%)	Survival rate (%)	Survival based Plantation Performance (High, > or = 90 percent, Medium <90 to > or= 80 percent, Low< 80 percent)
1	AJY Block plantation	Kalahandi North	1480	120	1600	7.5	92.5	High
2		Khariar	2000	50	2050	2.4	97.6	High
3		Total	1740	90	1830	4.7	95.3	High
4	Avenue Plantation	Kalahandi South	300	120	420	27.7	72.3	Low



Sl.	Type of Plantation	Divisions	Survival and Casualty of trees / Hectare of Plantation					
			Average No. of surviving trees (Hectares /RKM)	Average no of casualties of trees	Total	Causalityrate (%)	Survival rate (%)	Survival based Plantation Performance (High, > or = 90 percent, Medium <90 to > or= 80 percent, Low< 80 percent)
5	Bald Hill Plantation	Kalahandi North	1440	140	1580	8.9	91.1	High
6		Kalahandi Suth	1340	270	1600	16.6	83.4	Medium
7		Khariar	1860	100	1960	5.1	94.9	High
8		Sonepur	1420	150	1570	9.6	90.4	High
9		Total	1550	160	1710	9.2	90.8	High
10	Block plantation	Balangir	1210	350	1560	22.6	77.4	Low
11		Kalahandi South	1230	360	1580	22.5	77.5	Low
12		Khariar	1610	150	1760	8.5	91.5	High
13		Total	1280	320	1600	19.8	80.3	Medium
14	Fruit Bearing Plantation	Sunabeda Wildlife	1820	50	1870	2.7	97.3	High
15	OWP	Sonepur	1260	200	1460	13.7	86.3	Medium
		<b>Overall</b>	<b>1160</b>	<b>160</b>	<b>1320</b>	<b>12.4</b>	<b>87.6</b>	<b>Medium</b>

### 6.3.4 Canopy Performance

As it is depicted from the following table, overall average canopy density is calculated at 42.7 percent. Compared to the overall canopy coverage, it is found higher in Kalhandi (South), Bolangir and Sonepur divisions. Across plantation categories, canopy coverage stands highest for avenue plantation followed by block plantation and OWP plantation. In these three categories of plantations, canopy coverage is more than 50 percent. For Rest of the AR plantations it is less than 50 percent. The plantation performance on the basis of Canopy density is marked as high, medium and low. If the average canopy is > or= 70 percent, it is levelled as high; if the value is >50 and > or= 70 percent it is medium and < 50 percent it is low. Analysis of Plantation performance by canopy performance points out that the overall performance of all divisions is 'low' except Kalhandi South. In Kalahandi South, the said performance is found to be medium.





Table 6.8: AR Plantations performance by Canopy performance.

Type of Plantations	Average Canopy coverage (%) in AR Plantations						
	Balangir	Kalahandi North	Kalahandi South	Khariar	Sonepur	Sunabeda Wildlife	Grand Total
Block plantation		55.0		0.0			27.5
Bald Hill Plantation		52.7	0.0	20.0	45.0		30.8
Block plantation	61.9		85.0	0.0			54.8
FRUIT BEARING PLANTATION						30.0	30.0
OWP					50.0		50.0
Grand Total	44.6	37.9	55.0	27.5	46.3	30.0	42.7
Plantation performance on the basis of canopy performance (High, > or= 70 percent, Medium <70 or > and =50 percent, Low <50 percent)	Low	Low	Medium	Low	Low	Low	Low

### 6.3.5 Height and GBH/GCH Performance

The height and GBH/GCH performance of all the trees by plantation categories is assessed on the basis of mean of the maximum height and minimum height (in metres) as well as mean GBH/GCH (in CMs). The plantation performance by height is assessed by considering tree wise and plantation wise difference between the average maximum height and average minimum height per year. Similarly, Plantation performance by GBH/GCH is also assessed by taking the difference between average maximum GBH/GCH and average minimum GBH/GCH per year. As it can be observed from the following table, the performance of all types of plantations on the basis of height is found 'high'. On the other hand, performance of plantations on the basis of GBH/GCH, except OWP plantation, is found 'high'. The performance of OWP plantation on the basis of GBH/GCH is found medium.



Table 6.9: Height and GBH/GCH Performance of Trees

Type of plantation	Type of Trees	Average of Max Height in Metre	Average of Min Height in Metre	Average of MAX HEIGHT PER YEAR	Average of MIN HEIGHT PER YEAR	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average of MAX GBH/ GCH PER YEAR	Average of MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ GCH/ year & Ave Minimum GBH/ GCH/ Year	Height Performance (High < or =0.5, Medium >0.5 or =1, Low >1,)	GBH/ GCH Performance (High < or =3.0, Medium > 3.0 or =5, Low >5, )
AJY Block plantation	Arjuna	1	0.5	0.3	0.1	7	4	1.8	1	0.2	0.8	High	High
	Bamboo	3.2	2.7	0.8	0.7	12	5	1.5	0.6	0.1	0.9	High	High
	Gambhari	1.5	0.5	0.4	0.1	8	4	2	1	0.3	1	High	High
	Khaira	1.8	1.2	0.5	0.3	16	13	4	3.3	0.2	0.7	High	High
	Sisoo	2	0.5	0.5	0.1	10	4	2.5	1	0.4	1.5	High	High
	Teak	1.5	0.5	0.4	0.1	10	5	2.5	1.3	0.3	1.2	High	High
	Total	2	1.2	0.5	0.3	10.5	5.8	2.3	1.3	0.2	1	High	High
Avenue Plantation	Acacia auriculiformis	6		0.5	0	22		2	0	0.5	2	High	High
	Badachakunda	13	10.5	1.2	1	58.5	45.5	5.3	4.1	0.2	1.2	High	High
	Krushnachuda	10.1	8	0.9	0.7	23	18.5	2.1	1.7	0.2	0.4	High	High
	Neem	9.1	7	0.8	0.6	22	18	2	1.6	0.2	0.4	High	High
	Neem	9	6.5	0.8	0.6	22	17	2	1.5	0.2	0.5	High	High
	Total	10	8.4	0.9	0.7	32.7	27.2	3	2.1	0.2	0.9	High	High





Type of plantation	Type of Trees	Average of Max Height in Metre	Average of Min Height in Metre	Average of MAX HEIGHT PER YEAR	Average of MIN HEIGHT PER YEAR	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average of MAX GBH/ GCH PER YEAR	Average of MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Minimum height / Year	Diff between Av Max GBH/ year & Ave Minimum GHH/ Year	Height Performance (High < or =0.5, Medium >0.5 or =1, Low >1, )	GBH/ GCH Performance (High < or =3.0, Medium >3.0 or =5, Low >5, )
Bald Hill Plantation	Amla	2.5	1.5	0.6	0.4	10	8	2.5	2	0.2	0.5	High	High
	Arjuna	2.8	0.9	0.4	0.2	14	3	1.3	0.3	0.2	1	High	High
	Badachakunda	1.5	1	0.4	0.3	4	3	1	0.8	0.1	0.2	High	High
	Bamboo	1.9	0.6	0.5	0.1	12	4	0.8	0.3	0.4	0.5	High	High
	Bela	1.5	1.2	0.4	0.2	8	7	2	0.9	0.2	1.1	High	High
	Cashew	1.7	1.3	0.4	0.3	16	11.3	4	2.8	0.1	1.2	High	High
	Gambhari	2.4	1.6	0.6	0.4	20	8	2.5	1	0.2	1.5	High	High
	Jamun	1.8	1.4	0.5	0.4	10	9	2.5	2.3	0.1	0.2	High	High
	Karanja	1.2	0.8	0.3	0.2	8	5	0.7	0.4	0.1	0.3	High	High
	Khaira	2	0.9	0.5	0.2	9	4.5	1.5	0.8	0.3	0.7	High	High
	Mahaneem	1.2	0.9	0.3	0.2	9		2.3	0	0.1	2.3	High	High
	Neem	3.2	1.6	0.6	0.3	13.7	7.8	2.6	1.2	0.3	1.4	High	High
	Phasi	0.9		0.2	0			0	0	0.2	0	High	High
	Sanachankunda	4.1	3.7	0.8	0.7	19.7	16	3.7	2.9	0.1	0.8	High	High
	Sisoo	3.2	1.1	0.8	0.3	13.3	5.5	3.3	1.4	0.5	1.9	High	High
	Sunari	0.5	0.3	0.1	0.1			0	0	0	0	High	High
	Tamarind	0.6	0.5	0.2	0.1			0	0	0.1	0	High	High
	Teak	3.5	2	0.7	0.4	18.3	7.9	2.9	1.3	0.3	1.6	High	High
	Total	2.5	1.4	0.5	0.3	14	7.9	2.2	1.1	0.2	1.1	High	High



Type of plantation	Type of Trees	Average of Max Height in Metre	Average of Min Height in Metre	Average of MAX HEIGHT PER YEAR	Average of MIN HEIGHT PER YEAR	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average of MAX GBH/ GCH PER YEAR	Average of MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ year & Ave Minimum GBH/ Year	Height Performance (High < or =0.5, Medium >0.5 or =1, Low >1,)	GBH/ GCH Performance (High < or =3.0, Medium >3.0 or =5, Low >5,)
Block plantation	Amla	2.6	1.8	0.2	0.1	12.7	12.5	1.2	0.8	0.1	0.4	High	High
	Balai	6.4	2.7	0.7	0.3	20.5	9.5	2.2	1	0.4	1.2	High	High
	Bamboo	3.8	2.8	0.6	0.3			0	0	0.3	0	High	High
	Bheru	5.9	3	0.6	0.3	21.5	11.5	2.3	1.2	0.3	1.1	High	High
	Dhaura	6.4	2.3	0.7	0.2	23	13.5	2.4	1.4	0.5	1	High	High
	Gambhari	5.6	1	0.5	0	31	13	2.8	0.6	0.5	2.2	High	High
	Karanja	1.2	0.6	0.1	0.1	11		1	0	0	1	High	High
	Khairra	2.2	1.5	0.2	0.1	11.4	10.2	1	0.7	0.1	0.3	High	High
	Teak	6.8	5.2	0.6	0.5	32	17.8	2.9	1.6	0.1	1.3	High	High
	Total	4.7	3	0.5	0.3	21.8	13.8	1.8	0.9	0.2	0.9	High	High
Fruit Bearing Plantation	Amla	2	0.5	0.5	0.1	6	3	1.5	0.8	0.4	0.7	High	High
	Bahada	2.5	1	0.6	0.3	7	4	1.8	1	0.3	0.8	High	High
	Gangatentuli	1.5	0.5	0.4	0.1	5	3	1.3	0.8	0.3	0.5	High	High
	Kendu	2.5	1	0.6	0.3	7	3	1.8	0.8	0.3	1	High	High
	Total	2.1	0.8	0.5	0.2	6.3	3.3	1.6	0.8	0.3	0.8	High	High
OWP	Khairra	4	2	0.8	0.4	32	8	6.4	1.6	0.4	4.8	High	Medium
	Neem	7	3	1.4	0.6	28	10	5.6	2	0.8	3.6	High	Medium
	Teak	4	1	0.8	0.2	20	5	4	1	0.6	3	High	High
	Total	5	2	1	0.4	26.7	7.7	5.3	1.5	0.6	3.8	High	Medium





## 6.4 Assessment of Outcome Performance of ANR Plantation

With the objective of assessing the performance of ANR plantation, sixteen sample sites of ANR with gap plantation in all forest divisions except Sunabeda W/L section were considered. On an average 3 plots were chosen per sample site. The average area per ANR with gap plantation site was 88.2 hectares.

Table 6.10: Sample coverage of ANR Plantation

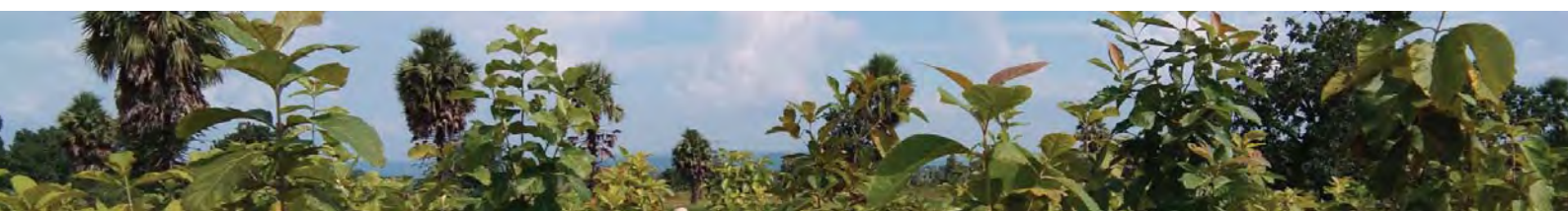
Sl.	Divisions	No of sites	No of Plots	No of Plots/ Site	Average of Area of the site (Ha)
1	Balangir	5	15	3	73.3
2	Kalahandi North	3	3	1	150.0
3	Kalahandi South	3	17	6	181.2
4	Khariar	2	9	5	155.6
5	Sonepur	3	11	4	109.1
	<b>Total</b>	<b>16</b>	<b>55</b>	<b>3</b>	<b>88.2</b>

### 6.4.1 Plant Survival and Casualty

Plant survival and casualty of ANR with gap plantation activities as summarized in the following table reveals that overall, there are 180 surviving trees per 200 trees planted. It was reported that plantation under ANR with gap plantation was undertaken in relatively bigger patches with block plantation mode of spacing between trees. There is overall survival of 89.8 percent 10.3 percent casualty. By ranking the extent of survival rate, it is found that the performance of Bolangir, Khariar and Sonepur divisions is found 'high'. The performance of Kalhandi South is 'medium' and it is 'low' for Kalhandi north. The 'low' performance of Kalahandi (North) is attributed to black cotton soil (locally called khalia soil) and in such soil conditions, plant survival generally stands lower as reported forest officials.

Table 6.11: Plantation Performance by Survivability

Sl.	Divisions	Total no of surviving trees /plot	No of trees with casualty/ Plot	Total trees/ Plot	No of surviving trees per 200 trees planted	Survival rate (%)	Plantation performance by Survival rate (High, > or = 90 percent, Medium <90 to or= 80 percent, Low<80 percent)
1	Balangir	145	15	160	181	90.6	High
2	Kalahandi North	122	38	160	153	76.3	Low
3	Khariar	149	11	160	187	93.4	High
4	Sonepur	150	10	160	188	93.8	High
5	Kalahandi South	139	21	160	174	86.9	Medium
	<b>Grand Total</b>	<b>144</b>	<b>16</b>	<b>160</b>	<b>180</b>	<b>89.8</b>	<b>Medium</b>



### 6.4.2 Canopy performance

The plantation performance on the basis of canopy coverage is as per the following table. The overall canopy coverage considering all the years and all divisions is found at 43.3 percent. Considering all plantation years, the canopy coverage for ANR with gap plantations stands maximum at Khariar division followed by Kalahandi (South) and Sonepur divisions. The plantation performance on the basis of canopy performance reveals that overall performance of ANR plantation on the basis of canopy performance is 'low'. However, it is found 'high' in Khariar division and 'medium' in Kalahandi (South) divisions.

*Table 6.12: Plantation performance on the basis of canopy performance*

Sl.	Plantation Year	Average Canopy (%) in ANR with Gap Plantation					
		Bolangir	Kalahandi North	Kalahandi South	Khariar	Sonepur	Grand Total
1	2014-15	51.7	30.0	48.3			43.3
2	2015-16	26.4					26.4
3	2015-16			35.5		40.0	35.5
4	2016-17			75.8	60.0	40.0	67.9
	All Years	39.1	30.0	53.2	60.0	40.0	43.3
	Plantation Performance by Canopy performance (High, > or= 70 percent, Medium <70 or > and =50 percent, Low <50 percent)	Low	Low	Medium	High	Low	Low

### 6.4.3 Height and GBH/GCH Performance

Overall height and GBH/GCH performance considering all ANR with gap plantations across forest divisions in Kalahandi circle are found at 0.4 metre and 1.4 CMs respectively. By fixing Height and GBH/GCH based performance criteria, the performance of ANR with gap plantation is found 'high'.





Table-6.13: Height and GBH/GCH Performance

Type of plant-plantation	Type of Trees	Average of Max Height in Metre	Average of Min Height in Metre	Average of MAX HEIGHT PER YEAR	Average of MIN HEIGHT PER YEAR	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average of MAX GBH/ GCH PER YEAR	Average of MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ GCH/ year & Ave Minimum GBH/ Year	Height Performance (High > or =0.5, Medium <0.5 or =1, Low >1, )	GBH/ GCH Performance (High > or =3.0, Medium <3.0 or =5, Low >5, )
ANR with GAP	Acacia auriculiformis	3.7	2	0.6	0.3	14.5	7	2.4	1.2	0.3	1.2	High	High
	Amla	2.7	1.4	0.6	0.3	12.2	6.1	2.5	1.2	0.3	1.3	High	High
	Arjuna	1.5	1.2	0.3	0.2	7	4.7	0.9	0.6	0.1	0.3	High	High
	Babul	2.3	1	0.6	0.3	7	4	1.8	1	0.3	0.8	High	High
	Badachakunda	2.9	1.7	0.6	0.3	11.4	6.6	2	1.1	0.3	0.9	High	High
	Bamboo	1.8	0.9	0.4	0.2	7.3	4.8	0.5	0.3	0.2	0.2	High	High
	Bela	0.6	0.5	0.2	0.1	9	7	2.3	1.8	0.1	0.5	High	High
	Chatiyani	4	3.3	0.7	0.6	27	17	4.5	2.8	0.1	1.7	High	High
	Funfana	1.1	0.9	0.2	0.2			0	0	0	0	High	High
	Gambhari	2.5	2.4	0.5	0.3	12.2	7.5	1.4	0.8	0.2	0.6	High	High
	Karanja	2.5	1.6	0.5	0.3	11.8	8.3	2.1	1.4	0.2	0.7	High	High
	Khaira	2.5	1.4	0.5	0.3	11	6.8	1.9	1.1	0.2	0.8	High	High
	Neem	2.9	1.3	0.4	0.2	10.5	6.3	2	1.2	0.2	0.8	High	High
	Phasi	1.8		0.3	0	12		2	0	0.3	2	High	High
	Sanachankunda	2.2	1.5	0.5	0.3	11.3	9.7	2.4	2.1	0.2	0.3	High	High
	Simaruba	2.8	1.1	0.6	0.2	13.5	6.5	2.7	1.3	0.4	1.4	High	High
	Sirisa	1.1	0.8	0.2	0.2	10		2	0	0	2	High	High
	Sisoo	1.5	0.8	0.3	0.2	7.6	4.3	0.9	0.5	0.1	0.4	High	High
	Teak	2.7	1.4	0.5		11.2	6.7	1.8	1	0.5	0.8	High	High
	Overall	2.4	1.4	0.4	0.25	10.9	6.6	1.9	0.9	0.2	1	High	High



## 6.5 Assessment of Outcome Performance of SSO Activities

With the objective of assessing the outcome performance of SSO activities, 15 plots each consisting of 1/10th hectares for all the three SSO- Bamboo forests are taken. The average forest area under SSO-bamboo is worked out at 532.3 hectares. The sample sites are taken from Kalahandi, North, Khariar and Sonapur forest divisions.

### 6.5.1 Canopy based performance

The performance of SSO activities for bamboo forest on the basis canopy performance is overall found 42.7 percent. However, for Kalahandi (North), the plantation performance on the basis of canopy performance criteria, it is found 'high' and for other two plantation sites at Khariar and Sonapur, the performance is found to be 'medium'.

Table 6.14: Sample Coverage of SSO- Bamboo activities.

Row Labels	No of sites	No of Plots	Average of Area of the site (Ha)	Average of Canopy %	Plantation performance on the basis of canopy Performance (High, > or= 70 percent, Medium <70 or > and =50 percent, Low <50 percent)
Kalahandi North	1	5	1137.6	70.0	High
Khariar	1	5	259.3	50.0	Medium
Sonapur	1	5	200.0	60.0	Medium
Grand Total	3	15	532.3	42.7	Low

### 6.5.2 Clumps and Culms performance

As per the analysis made in the following table, on an average, there are 66 clumps per hectare of forest area and there is no damage of clumps on the basis of sample plots data. The number of first year culms, second year culms and more than two years culms per hectare of forest area are found at 330, 396 and 594 respectively. Performance of SSO bamboo forests for all the reporting divisions is found 'high'.

Table 6.15: Clumps and culms performance in SSO bamboo forests

Divisions	Average performance per hectare of bamboo forest area					Plantation performance by Casualty (High, < or = 10 percent, Medium >10 to > or= 20 percent, Low > 20 percent)
	Average of No of Clumps	No of clumps damaged	Average of 1st year culms	Average of 2nd year culm	Average of more than 2 years	
Kalahandi North	62	0	310	372	558	High
Khariar	70	0	350	420	630	High
Sonapur	66	0	330	396	594	High
Grand Total	66	0.0	330	396	594	High





## 6.6 CRM

With the objective of assessing the performance of CRM activity in Kalhandi circle, one plantation site which is a Old Teak Management site located at Kalhandi South forest division is considered. The area of the site is about 20.0 hectares.

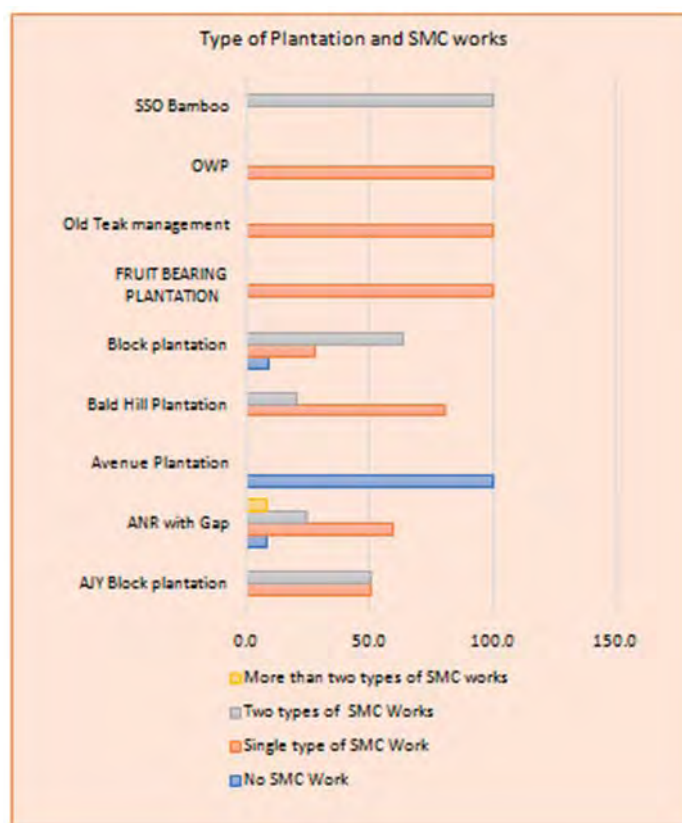


Figure 6.4: Type of Plantation & SMC Works

Table 6.16: Performance of Old Teak Management Plantation.

Particulars	Performance
Name of the Plantation	Old Teak Management, Kalahandi South division
Area of the site (Ha)	20.0 Hectares
Intervention	
Maximum Height of the tree	12.3 Metres
Minimum Height of the tree	6.9 Metres
Plantation performance by Casualty (High, < or = 10 percent, Medium >10 to > or= 20 percent, Low> 20 percent)	Medium

## 6.7 SMC Works

The study finds that SMC works are undertaken at plantation sites. In many cases, beyond plantation sites also a varieties of SMC structures are created. On plantation sites, staggered trenches, SMC Structures etc. have been under taken. As it is observed from the following table SMC works are created on about 92.3 percent of plantation sites. Overall, about 49 percent of the plantation sites have single SMC works and about 38.5 percent of the plantation sites have two SMC works on plantation sites. Only about 4.8 percent of the sites have three types of SMC works on plantation sites. As it can be observed from the chart given alongside, 100 percent of SSO bamboo sites have two types of SMC works. All of the plantation sites under OWP, Old teak management, and fruit bearing plantation categories are found with single type of SMCs. There is no SMC works for avenue plantations.

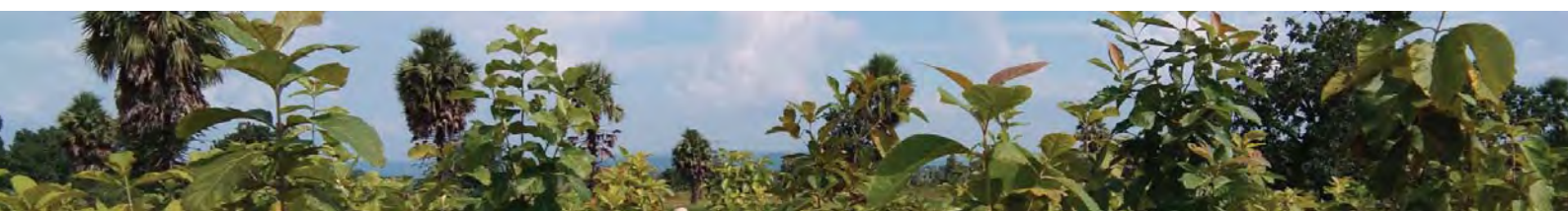


Table 6 17: Type of Plantation Activities and SMC works.

Type of Plantation Activity	Divisions	No of SMC Structures (% of Plantation sites undertaking SMC works at Plantation sites)				
		0	1	2	3	Total
AJY Block plantation	Kalahandi North	0.0	0.0	100.0	0.0	100.0
	Khariar	0.0	100.0	0.0	0.0	100.0
	Total	0.0	50.0	50.0	0.0	100.0
ANR with Gap	Balangir	0.0	66.7	33.3	0.0	100.0
	Kalahandi North	0.0	100.0	0.0	0.0	100.0
	Kalahandi South	29.4	41.2	0.0	29.4	100.0
	Khariar	0.0	44.4	55.6	0.0	100.0
	Sonepur	0.0	54.5	45.5	0.0	100.0
	Total	8.2	59.0	24.6	8.2	100.0
Avenue Plantation	Kalahandi South	100.0	0.0	0.0	0.0	100.0
Bald Hill Plantation	Kalahandi North	0.0	100.0	0.0	0.0	100.0
	Kalahandi South	0.0	0.0	100.0	0.0	100.0
	Khariar	0.0	100.0	0.0	0.0	100.0
	Sonepur	0.0	100.0	0.0	0.0	100.0
	Total	0.0	80.0	20.0	0.0	100.0
Block plantation	Balangir	0.0	0.0	100.0	0.0	100.0
	Kalahandi South	50.0	50.0	0.0	0.0	100.0
	Khariar	0.0	100.0	0.0	0.0	100.0
	Total	9.1	27.3	63.6	0.0	100.0
Fruit Bearing Plantation	Sunabeda Wildlife	0.0	100.0	0.0	0.0	100.0
Old Teak management	Kalahandi South	0.0	100.0	0.0	0.0	100.0
OWP	Sonepur	0.0	100.0	0.0	0.0	100.0
SSO Bamboo	Kalahandi North	0.0	0.0	100.0	0.0	100.0
	Khariar	0.0	0.0	100.0	0.0	100.0
	Sonepur	0.0	0.0	100.0	0.0	100.0
	Total	0.0	0.0	100.0	0.0	100.0
All Plantations and All Divisions		7.7	49.0	38.5	4.8	100.0

### 6.7.1 Type of SMC Works:

Staggered trenches, half-moon trenches, LBCD, stone packing and percolation pits are the different type of SMC works found at the plantation sites. Overall about 77.9 percent of the plantation sites are found with staggered trenches. Percolation pits are found only in ANR with gap plantation of Kalahandi South forest division. Stone packing are found with SSO bamboo operations.

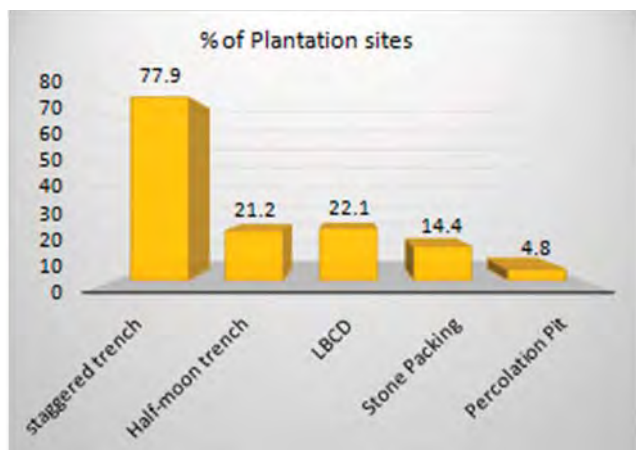


Figure 6.5: Percentage of Plantation Sites





Table 6.18: Type of SMC works

Type of Plantation Activity	Divisions	% of Plantation Sites				
		Staggered trench	Half-moon trench	LBCD	Stone Packing	Percolation Pit
AJY Block plantation	Kalahandi North	100.0	0.0	100.0	0.0	0.0
	Khariar	100.0	0.0	0.0	0.0	0.0
ANR with Gap	Balangir	100.0	0.0	33.3	0.0	0.0
	Kalahandi North	100.0	0.0	0.0	0.0	0.0
ANR with Gap	Kalahandi North	100.0	0.0	0.0	0.0	0.0
	Kalahandi South	70.6	29.4	0.0	0.0	29.4
	Khariar	100.0	0.0	55.6	0.0	0.0
	Sonepur	100.0	0.0	45.5	0.0	0.0
Bald Hill Plantation	Kalahandi North	100.0	0.0	0.0	0.0	0.0
	Kalahandi South	100.0	100.0	0.0	0.0	0.0
	Khariar	100.0	0.0	0.0	0.0	0.0
	Sonepur	100.0	0.0	0.0	0.0	0.0
Block plantation	Balangir	100.0	0.0	100.0	0.0	0.0
	Kalahandi South	50.0	0.0	0.0	0.0	0.0
	Khariar	100.0	0.0	0.0	0.0	0.0
FRUIT BEARING PLANTATION	Sunabeda Wildlife	100.0	0.0	0.0	0.0	0.0
Old Teak management	Kalahandi South	100.0	0.0	0.0	0.0	0.0
OWP	Sonepur	100.0	0.0	0.0	0.0	0.0
SSO Bamboo	Kalahandi North	0.0	100.0	0.0	100.0	0.0
	Khariar	0.0	100.0	0.0	100.0	0.0
	Sonepur	0.0	100.0	0.0	100.0	0.0
	<b>Overall</b>	<b>77.9</b>	<b>21.2</b>	<b>22.1</b>	<b>14.4</b>	<b>4.8</b>

**Extent of Siltation:** Due to SMC structure, silt deposits start to take place and with the passage of time, amount of silt deposits tends to increase. The overall silt deposit for different SMC structures is found at 46 percent. Plantation sites having two types of SMCs are found with more silt deposits. On the basis of siltation performance criteria, the overall SMC performance of Kalahandi circle is medium. In Khariar and Sonepur divisions, the SMC performance is found high.



Table 6.19: Average extent of Siltation

Divisions	Average of Extent of Siltation (%) by number of SMC at Plantation sites				Performance of SMC works (If siltation percentage is > or =50, High, <50 and > or= 30, Medium, <30, Low)
	Single type of SMC	Two types of SMCs	More than two types of SMCs	Total	
Balangir	30	36		33	Medium
Kalahandi North	37	36		37	Medium
Kalahandi South	45	10	20	33	Medium
Khariar	51	65		58	High
Sonepur	53	75		65	High
Sunabeda Wildlife	40			40	Medium
<b>Grand Total</b>	<b>44</b>	<b>53</b>	<b>20</b>	<b>46</b>	<b>Medium</b>

**Water Bodies:** Apart from SMC works carried out at plantation sites, a number of water bodies are also created in the forest for the benefits of wild animals. Externalities of such water bodies are also felt by the immediate neighbourhood community. All the water bodies were created during the period 2012-13 to 2016-17. The details of the water bodies covered in the study are as per the following table-19.

### Case Study: Earthen Bund at Singar RF To Strengthen Soil Moisture Conservation Activity

Circle: Bhawanipatna, Division: Kalahandi South, Range : Thuamulrampur South,  
Section : Kalampur, Beat: Thuamul Rampur, Village : Kosabarda, RF: Singar RF

Earthen bunds are essentially external catchments, long slope technique of water harvesting. This type of SMC structure is highly required for the hilly and rocky area to restore water and recharge ground water. As Thuamul Rampur is one of the hilly areas and SMC structures are highly required to maintain moisture contents in the soil and also for water level.

Kalahandi South division have developed so many SMC work to strengthen the soil moisture conservation. One such SMC work has been done in the Thuamul Rampur South Range at Singar RF, Kosabarda village. The site was selected by the Soil Conservation team that came from Bhubaneswar under hilly block SMC work. After that a 500-meter earthen bund has been created under CAMPA APO 2016-17.

There is a tube well near the earthen bund where water was not available but after creation of the bund water got recharged and people would get the water from tube well. There was another important impact of the bund has been observed that there is one teak plantation along with the bund which leaves became dry and fell down but after SMC work the greenery of the teak plantation has getting increased over the period of time.





Table 6.20: Current Status and Impact of water bodies

Sl.	Divisions	Year	Number of Water Bodies	Current Status	Key observations	Evaluator's Assessment from 10 points scale	Performance Ranking (< or= 3, Low, > 3 & < or = 7, Medium, >7, High)
1	Balangir	2013-14	1	Defunct and not used	<ul style="list-style-type: none"> <li>Water is available only in rainy season and 2-3 months after rainy season.</li> <li>Inlet and Outlets choked by silt deposits.</li> </ul>	2	Low
2		2014-15	1	Defunct and not used	<ul style="list-style-type: none"> <li>Water body being used by villagers.</li> <li>Entrance slope for animal is available.</li> </ul>	7	Medium
3	Kalahandi (North)	2013-14	1	Used by nearby villagers	<ul style="list-style-type: none"> <li>Bathing by villagers as well as used drinking purpose by wild animal in the night.</li> <li>It is also used for fishing by the villagers.</li> </ul>	8	High
4	Kalahandi (South)	2014-15	1	Defunct and not used	<ul style="list-style-type: none"> <li>Drinking of water by the Wild animals only during rainy season when water is available.</li> <li>The water body is inside Karlapat sanctuary. During rainy season, when water available, it is used by elephants for bathing.</li> </ul>	5	Medium
5	KHARIAR	2012-13	1	Currently functioning and Used	<ul style="list-style-type: none"> <li>Drinking of water by the Wild animals.</li> <li>Quality of bunds are observed good for which water availability is throughout the year is reported.</li> <li>The location is easily accessed to wild animals</li> </ul>	7	Medium
6	SONEPUR	2013-14	1	Currently functioning and Used	<ul style="list-style-type: none"> <li>Drinking water availability the Wild animals</li> </ul>	8	High
7		2014-15	1	Currently functioning and Used	<ul style="list-style-type: none"> <li>Drinking of water the Wild animals</li> </ul>	8	High



Sl.	Divisions	Year	Number of Water Bodies	Current Status	Key observations	Evaluator's Assessment from 10 points scale	Performance Ranking (< or= 3, Low, > 3 & < or = 7, Medium, >7, High)
8	SUNABEDA WILDLIFE	2014-15	1	Currently functioning and Used	• Drinking available for water Wild animals	8	High
9		2015-16	1	Currently functioning and Used	• Drinking available for water Wild animals	8	High
10		2016-17	1	Currently functioning and Used	• Drinking availability for water Wild animals	8	High

## 6.8 Overall Management of Plantation Activities

Khariar division maintains it for AJY led block Plantation, bald hills plantations, block plantation and SSO bamboo activities. Sonapur division maintains it for bald hills plantation, OWP plantation and SSO bamboo activities. Sunabeda W/L division maintains it fruit bearing plantations (fodder plantations). Plantation journals are maintained for all of the AR Plantation activities. About 90 percent of the overall sample plantation activities comprises of AR plantation activities for which plantation journals are maintained. However, only 66.3 percent of plantain sites maintained it fully. Remaining 23.1 percent maintained it partially and about 10.6 percent don't maintain it. Plantation maps are maintained by 86.5 percent of the sites. Micro Plans are prepared under plantation programmes carried out under "Ama Jungle Yojana" only. Sign boards and pillars are maintained in all the sample sites.





Table 6.2.1: Management of Plantation Activities

Divisions	% of Plantation sites maintaining								Status of Pillars			
	Plan- ta- tion Journal	Plan- ta- tion journals fully main- tain- ed	Plan- ta- tion journals partly main- tain- ed	Plan- ta- tion Map	Micro Plan	Treat- ment Map	Mainte- nance of registers	Sign Boards at Plan- ta- tion sites	Pillars at plan- ta- tion sites	Average of No. of pillars installed/ Plantation site	Average of No. of pillars witne- ssed/ Plantation site	% of pillars witnessed
Balangir	100.0	68.2	31.8	90.9	0.0	0.0	0.0	77.3	100.0	36	2	6.9
Kalahandi North	72.2	22.2	50.0	100.0	5.6	0.0	33.3	77.8	100.0	21	2	10.5
Kalahandi South	100.0	70.8	29.2	91.7	0.0	0.0	0.0	87.5	100.0	38	3	9.0
Khariar	100.0	100.0	0.0	75.0	0.0	0.0	5.0	45.0	100.0	48	2	3.6
Sonepur	73.7	68.4	5.3	73.7	0.0	57.9	0.0	42.1	100.0	40	1	2.5
Sunabeda Wildlife	100.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	100.0		1	
Grand Total	90.4	66.3	23.1	86.5	1.0	10.6	6.7	67.3	100.0	37	2	6.2

## 6.9 Protection Measures

The various type of protection measures introduced for plantation activities is summarized as per the following table 6.21.

*Table 6.22: Plantation wise Protection Measures*

Type of Plantation	Reported/ Observed Protection Measures
AJY Block Plantation	<ul style="list-style-type: none"> <li>Bamboo fencing</li> <li>Watch and Ward by VSS members (Thengapali)</li> </ul>
ANR with Gap	<ul style="list-style-type: none"> <li>Watch &amp; ward upto three years after the plantation year</li> <li>Creation of Fire-lines</li> </ul>
ANR with Gap	<ul style="list-style-type: none"> <li>Handed over to VSS for protection</li> <li>Watch and Ward</li> </ul>
Avenue Plantation	<ul style="list-style-type: none"> <li>No protection measures</li> </ul>
Bald Hill Plantation	<ul style="list-style-type: none"> <li>Awareness created among local people against illegal cutting of trees</li> <li>Bamboo Fencing</li> <li>Green Fencing, Brush wood fencing has protected the entry of the local cattle &amp; goat</li> <li>Watch and Word</li> </ul>
Block plantation	<ul style="list-style-type: none"> <li>Handed over VSS for protection</li> <li>Linkage with VSS for protection measure</li> </ul>
Fruit Bearing Plantation	<ul style="list-style-type: none"> <li>Watch and ward</li> </ul>
Old Teak management	<ul style="list-style-type: none"> <li>Protection by VSS members</li> <li>Creation and maintenance of fire line</li> </ul>
OWP Plantation	<ul style="list-style-type: none"> <li>Watch and ward</li> </ul>
SSO Bamboo	<ul style="list-style-type: none"> <li>Watch and ward</li> </ul>

## 6.10 Ama Jungle Yojana

With the objective of assessing the performance of Ama Jungle Yojana, type of involvement of VSSs in plantation activities, practices followed by VSSs for AJY led plantation, and various impacts of CAMPA as undertaken four sampled out VSSs at Kalahandi (South), Kalahandi (North), Bolangir, divisions were assessed.

### 6.10.1 Involvement in Plantation Activities

As it is observed from the following table, all the sample VSSs follow CAMPA guidelines for plantation activities and undertake pre planning for plantation activities. Three out of four VSSs reported their respective involvements at various stages of plantation development. All the VSSs adhere to project implementation plans. All the VSSs do maintain good relationship and cooperation with department people.





Table 6.23: Type of Involvement in Plantation Activities

Sl. NO	Name of the VSS / Division/ Range/ Section/ Beat/ Village	Number of Sampled out VSSs					
		Following CAMPA guidelines	Pre planning	Involve-ment in various stages	Proper Project planning	Proper Project Impleme-ntation Plans	Good relationship and cooperation with department people
1	Podapadar VSS/ Kalahandi(S)/ Biswanathpur/ Sikerkupa Langigarh Road/ Podapadar	Yes	Yes	Yes	Yes	Yes	Yes
2	Bagmunda VSS / Kalahandi(N)/ Key gaon/ Keygaon/Keygoan/ Bagmunda	Yes	Yes	Yes	Yes	Yes	Yes
3	Nuapali VSS / Balangir/ Harisankar/ Harisankar/ Nandupada Nuapali	Yes	Yes	Yes	Yes	Yes	Yes
4	Kulsara VSS / Balangir/Bolangir Haridatal/ Brahmanidunguri Kulsara	Yes	Yes	No	No	Yes	Yes

### 6.10.2 Practices followed

Out of four sampled VSSs, two VSSs undertake meetings regularly and two VSSs do so occasionally. However, the attendance in the meeting is average implying that more than 50 percent of the VSS members participate in the meeting. Out of four VSSs, two VSSs conduct awareness programmes regarding positive impacts of plantation programme. With respect to record maintenance, two VSSs out of four VSSs maintain and update records properly. For labour participation in plantation activities, wage payments are received fortnightly by majority of VSSs. DBT through bank A/Cs is reported by two out of four VSSs.

Table 6.24: Practices followed by VSSs for AJY led Plantation

Sl.	Name of the VSS / Division/ Range/ Section/ Beat/ Village	Frequ-ency of JFM meeting	Attend-ance rate in meeting	Held of awareness prog	Mainte-nance of VSS Register	Wage payment system	Mode of payment
1	Podapadar VSS/ Kalahandi(S)/ Biswanathpur/ Sikerkupa Langigarh Road/ Podapadar	Rarely	Average	No	Properly maintained	Weekly	Cash



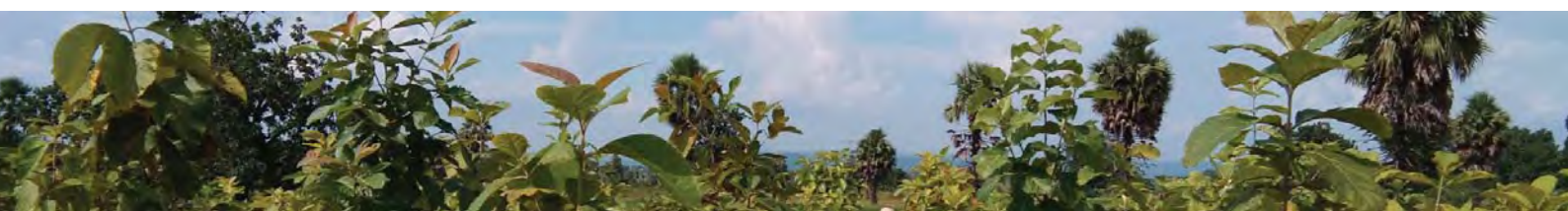
Sl.	Name of the VSS / Division/ Range/ Section/ Beat/ Village	Frequency of JFM meeting	Attendance rate in meeting	Held of awareness prog	Maintenance of VSS Register	Wage payment system	Mode of payment
2	Bagmunda VSS / Kalahandi (N)/Key gaon/ Keygaon/ Keygoan/ Bagmunda	Regularly	Average	Yes	Properly maintained	within 15 days	Cash
3	Nuapali VSS / Balangir/ Harisankar Harisankar/ Nandupada Nuapali	Regularly	Average	Yes	Partly Maintained	within 15 days	Bank A/C
4	Kulsara VSS / Balangir/ Bolangir Haridatal/ Brahmanidunguri Kulsara	Rarely	Average	No	Partly Maintained	within 15 days	Bank A/C

### 6.10.3 Impacts of CAMPA

Due to CAMPA support, status of plantation is found to have been improved in all the VSS areas, and frequency of forest fire incidences is rarely witnessed, there is no Podu cultivation which was practiced by the villagers previously. Frequency human animal conflict is rarely reported. Due to CAMPA supported plantation and SMC works, water level in forest fringe villages tended to increase.

Table 6.25: Impact of CAMPA

Sl.	Name of the VSS / Division/ Range/ Section/ Beat/ Village	Status of plantation	Fire incidences	Practice of Podu cultivation	Frequency the human Animal conflict	Change of water level after plantation under CAMPA
1	Podapadar VSS/ Kalahandi(S)/ Biswanathpur/ Sikerkupa Langigarh Road/ Podapadar	Improved	Rarely	No	Never	Increased
2	Bagmunda VSS / Kalahandi(N)/Key gaon/Keygaon/ Keygoan/ Bagmunda	Improved	Rarely	No	Rarely	Increased
3	Nuapali VSS / Balangir/Harisankar Harisankar/ Nandupada Nuapali	Improved	Rarely	No	Rarely	Increased
4	Kulsara VSS / Balangir/Bolangir Haridatal/ Brahmanidunguri Kulsara	Improved	Rarely	No	Rarely	Increased





## 6.11 Plantation Assessment observation

Table 6.26: Observations for different type of Plantation activities evaluated

Sl. No	Type of Plantation/ Division/ Range/ Section/ Beat	Observations	Impact of the Plantation Activities
1	AJY Block plantation/ Khariar/ Khariar/ Ranimunda/ Ranimunda	<ul style="list-style-type: none"> <li>Plantation and growth of plants are good.</li> <li>VSS is taking care of the site.</li> <li>The people of VSS got employment during plantation and expect considerable income in future from it.</li> <li>Cleaning work has been done properly by the VSS.</li> <li>There is a good relationship and coordination between the dept. &amp; VSS.</li> </ul>	<ul style="list-style-type: none"> <li>People of the nearby village got work and wages. They could now procure the forest produce easily.</li> <li>It helped the cattle in getting ample food.</li> </ul>
2	AJY Block plantation / Kalahandi North / Kegaon / Kegaon / Bagmunda	<ul style="list-style-type: none"> <li>The migration rate has minimized after intervention.</li> <li>Plantation has been done on 10 Ha. out of 50 Ha.</li> <li>The species such as Sisu, Khaira, Sipa, Mango, Bamo, Tentuli have been planted.</li> <li>Khira is the dominating species followed by Bamboo.</li> <li>natural species like Dhura, Dhatuki, Karla etc have been found in the site.</li> </ul>	<ul style="list-style-type: none"> <li>Shifting cultivation has stopped after intervention of AJY.</li> </ul>
3	ANR with Gap/ Balangir/ Harisankar/ Khaprakhol/ Khaprakhol	<ul style="list-style-type: none"> <li>Teak is a dominating species in the site.</li> <li>Teak was used as casualty replacement.</li> <li>Grasses are covered at all corners of the plantation which is a requirement.</li> <li>4-year cleaning is mostly required.</li> <li>Linkage of VSS should be more effective.</li> </ul>	<ul style="list-style-type: none"> <li>Natural species grow well due to more protection.</li> </ul>
4	ANR with Gap/ Balangir/ Patnagarh/ Patnagarh/ Goelmara	<ul style="list-style-type: none"> <li>Green coverage has increased.</li> <li>Climate related species should be planted.</li> <li>Sal, Bija, Dhatuki, Char, Salei &amp; Neem are the natural species.</li> </ul>	<ul style="list-style-type: none"> <li>Protected the natural species only.</li> </ul>
5	ANR with Gap/ Balangir/ Patnagarh/ Bandhapada/ Deisebd	<ul style="list-style-type: none"> <li>Due to SMC work, erosion of topsoil has minimised.</li> <li>Illicit felling has not been observed in the site.</li> <li>Teak is the dominating species due to which the growth rate of other planted species was affected.</li> <li>Natural species like Salei, Bija, Gambhari, Kendu, Bhalia Neem, Mahula etc. have been observed.</li> </ul>	<ul style="list-style-type: none"> <li>SSO work and protection of plantation helps in regeneration of natural species.</li> </ul>



Sl. No	Type of Plantation/ Division/ Range/ Section/ Beat	Observations	Impact of the Plantation Activities
6	ANR with Gap/ Balangir/ Balangir/ Balangir-I/ Gadhrel	<ul style="list-style-type: none"> <li>Growth of the plants affected due to poor soil type i.e. Khaliya Soil.</li> <li>Reserve pillar used as a one side demarcation in the plantation site.</li> <li>Natural species like Kendu, Sal, Char, Mahula etc. were observed in the site.</li> </ul>	<ul style="list-style-type: none"> <li>No such type of impact found as the survival rate is very less.</li> </ul>
7	ANR with Gap/ Balangir/ Balangir/ Balangir-II/ Khaliakani	<ul style="list-style-type: none"> <li>Rugudi &amp; Khalia soil in the site effects the growth of the plantation.</li> <li>Sabai grass coverage is found in most of the areas which needs to be cleared as this grass is prone to fire.</li> </ul>	<ul style="list-style-type: none"> <li>Higher survival of Natural species as compared to planted species.</li> </ul>
8	ANR with Gap/ Khariar/ Komna/ Komna/ Kamkeda	<ul style="list-style-type: none"> <li>Teak plants are planted at the side (before) of the original Forest. Plants are well grown.</li> <li>Staggered trench &amp; LBCD are constructed to reduce soil erosion and increased moisture content in the soil.</li> <li>The nearby villagers got work which increase their income.</li> <li>It increases the safety of the wild animals.</li> <li>The watch and ward are properly done. Emphasis should be given on cleaning.</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage of the site has increased.</li> <li>People of the nearby village got work and wages.</li> <li>Soil conservation has also increased.</li> </ul>
9	ANR with Gap/ Khariar/ Nuapada/ Lakhna/ Lakhna	<ul style="list-style-type: none"> <li>The Plants are well grown, and the gap is properly maintained.</li> <li>The SMC structures are orderly done.</li> <li>Watch &amp; ward and monitoring system is properly done.</li> <li>It raised the income of nearby villagers and people got grass for their cattle.</li> <li>Emphasis to be given on cleaning &amp; weeding.</li> </ul>	<ul style="list-style-type: none"> <li>Increased green coverage has in the site.</li> <li>People of the nearby village got work and wages.</li> <li>The nearby villagers got forest produce easily.</li> </ul>
10	ANR with Gap/ Sonapur/ Biramaharajpur/ Durdura/ Durdura	<ul style="list-style-type: none"> <li>The plantation is done properly and growth of plants are good.</li> <li>The SMC structures are made properly following the proper procedure.</li> <li>The people of nearby villages got work and grass for their cattle.</li> <li>The site is protected with watch &amp; ward.</li> <li>More emphasis should be given for cleaning.</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage has increased in the site.</li> <li>People of the nearby village got work and wages.</li> <li>The nearby villagers got forest produce easily.</li> </ul>





Sl. No	Type of Plantation/ Division/ Range/ Section/ Beat	Observations	Impact of the Plantation Activities
11	ANR with Gap / Sonepur/ Ulunda/ Ulunda/ Dhodhala	<ul style="list-style-type: none"> <li>The plantation is done properly, and growth of plants is good.</li> <li>The SMC structures are made properly following the necessary procedure.</li> <li>Some people got work which resulted in the increase of their income.</li> <li>The site is well protected with watch &amp; ward.</li> <li>This attempt of filling the gaps helped in preserving greenery of the area.</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage has increased in the site.</li> <li>Generated wage employment opportunities for near by people.</li> <li>The nearby villagers got forest produce easily.</li> </ul>
12	ANR with Gap/ Sonepur/ Ulunda/ Sindhol/ Bpadarapalli	<ul style="list-style-type: none"> <li>This type of Bamboo plantation is rarely found, and growth of plants is good.</li> <li>Only 50 clumps are planted per Ha filling the gaps.</li> <li>The SMC structures like LBCD and tagged trench are done properly.</li> <li>The people got work. Due to this attempt, the wild animals are protected along with the preservation of greenery.</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage has increased in the site.</li> <li>Wage employment opportunities for local people created.</li> <li>The nearby villagers got forest produce easily.</li> <li>Soil erosion is minimized.</li> </ul>
13	ANR with Gap/ Kalahandi South/ Th. Rampur(N)/ Saisurni/ Saisurni	<ul style="list-style-type: none"> <li>More than 80% survival rate has been observed in the plantation site. Overall plantation growth is satisfactory. Earthen trench structure has been created at the lower side of the plantation to store rainwater.</li> <li>Natural species like Kendu, Bela, Sala, Kusum, Sahaj, Harda, Kurai and Asan were found and due to SSO work natural regeneration of some of the species was observed.</li> <li>Pokasunga &amp; Bealai are the dominating bushes observed in the plantation area.</li> <li>Weeding and cleaning has been done during the time of plantation but at the time of field visit it could not be measured.</li> <li>Fire line was also created.</li> </ul>	<ul style="list-style-type: none"> <li>Green Coverage of the area has increased.</li> <li>Due to plantation and SSO work, people of nearby villages got the work and wages. Due to SMC work, siltation check and moisture content of the soil has increased.</li> </ul>
14	ANR with Gap/ Kalahandi South/ Th. Rampur(S)/ Th. Rampur(S)/ Ranipadar	<ul style="list-style-type: none"> <li>Sidha, cashew and sal are the natural species observed in the site.</li> <li>Teak and Chakunda were used to replace casualty.</li> <li>Growth of the plantation got affected due to rocky &amp; stone structured area.</li> </ul>	<ul style="list-style-type: none"> <li>Plantation has been done on the hilly terrain as a result of which erosion of topsoil has been checked.</li> </ul>



Sl. No	Type of Plantation/ Division/ Range/ Section/ Beat	Observations	Impact of the Plantation Activities
15	ANR with Gap/ Kalahandi South/ Jaipatna/ Uchhala/ Kukud	<ul style="list-style-type: none"> <li>Some of clumps have 2 to 3 culms.</li> <li>Growth rate is very low.</li> <li>Biotic interference has been observed.</li> </ul>	<ul style="list-style-type: none"> <li>Creation of fodder plantation for floating elephant from Karlapat sanctuary.</li> </ul>
16	ANR with Gap/ Kalahandi South/ Biswanathpur/ Musanala/ Machul	<ul style="list-style-type: none"> <li>Protected the natural species.</li> <li>Regeneration of natural species like Teak, Mahula, Kendu, Char etc. has been observed in the site.</li> </ul>	<ul style="list-style-type: none"> <li>Increase in the soil moisture.</li> </ul>
17	ANR with Gap / Kalahandi North/ Kesinga/ Rupra Road/ Dampadar	<ul style="list-style-type: none"> <li>No watch &amp; ward due to 5 years plantation.</li> <li>As the area is mostly occupied by sandy to loamy soil, Khaira is the dominating species.</li> <li>Except Khaira, growth of the other species is not enough due to poor (khalia) soil.</li> <li>Operations like weeding, SSO work and LBCD have been done.</li> <li>Sabai grass is also found in few corners of the plot.</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage of the site has increased.</li> <li>Due to SMC work, erosion of topsoil is minimised.</li> </ul>
18	ANR with Gap / Kalahandi North/ Kesinga/ Kasurpada/ Singjharan	<ul style="list-style-type: none"> <li>Natural species are dominating species like Bheru, Sal, Asana, Kendu, Sahaja, Rohin, Sina, Amla, Char and Piasal.</li> <li>Due to Khalia soil, growth of the plantation was affected.</li> </ul>	<ul style="list-style-type: none"> <li>Soil moisture conservation of the site has increased.</li> </ul>
19	Avenue Plantation / Kalahandi/ South/Jaipatna/ Jaipatna/ Mukhiguda	<ul style="list-style-type: none"> <li>Growth of the plantation is good enough.</li> <li>Due to public awareness illicit felling hasn't been observed.</li> </ul>	<ul style="list-style-type: none"> <li>Increased in greenery on both sides of the road.</li> </ul>
20	Bald Hill Plantation/ Khariar/ Khariar/ Karlakote/ Karlakote	<ul style="list-style-type: none"> <li>The plants are well grown.</li> <li>Waste land has been covered with green plants.</li> <li>Staggered trench has been constructed properly to check soil erosion.</li> <li>Time to time cleaning &amp; weeding to be done for better growth.</li> <li>More emphasis to be given on watch &amp; ward.</li> </ul>	<ul style="list-style-type: none"> <li>The waste land has been converted into greenery.</li> <li>The soil erosion is minimised due to SMC work in the site.</li> </ul>
21	Bald Hill Plantation/ Khariar/ Komna/ Komna/ Pandelvelly	<ul style="list-style-type: none"> <li>The plants are well grown and protected with barbed fencing.</li> <li>SMC structures are properly done.</li> <li>The people of nearby villages got work which increased their income.</li> <li>Erosion of the topsoil has been minimised.</li> <li>Watch &amp; ward activities are well done.</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage has increased.</li> <li>Erosion of topsoil is reduced due SMC works in the site.</li> </ul>





Sl. No	Type of Plantation/ Division/ Range/ Section/ Beat	Observations	Impact of the Plantation Activities
22	Bald Hill Plantation/ Khariar/ Nuapada/ Lakhna/ Anlajuba	<ul style="list-style-type: none"> <li>A waste land has been converted to green area.</li> <li>SMC structures were properly done.</li> <li>Growth of teak was conveniently high as compared to other species.</li> <li>Cleaning and pruning are not done properly.</li> <li>Watch &amp; ward system is good</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage has increased.</li> <li>Erosion of topsoil has reduced due to SMC work in the site.</li> </ul>
23	Bald Hill Plantation/ Sonepur/ Biramaharajpur/ Subalaya/ Chandili	<ul style="list-style-type: none"> <li>The growth of plants is good.</li> <li>The wild animals are well protected with the development of this site.</li> <li>A barren land can be converted into green area encouraging afforestation.</li> <li>The SMC structures are made properly.</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage has increased.</li> <li>Erosion of top soil has reduced due SMC work in the site.</li> </ul>
24	Bald Hill Plantation/ Kalahandi South/ Jaipatna/ Benakhamar/ Mahulpatna	<ul style="list-style-type: none"> <li>Neem, Maha Neem, Siso, Jamu, Bela and shuch species were eaten by local cattle's in the site.</li> <li>Due to stony and hilly land the soil moisture can major threat to increase the casualty rate</li> <li>Sanchakunda, cashew and Karanja have more survival rate than other planted species.</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage has increased.</li> <li>Erosion of topsoil has reduced due to SMC work in the site.</li> </ul>
25	Bald Hill Plantation/ Kalahandi North/ Kegaon/ Golamunda/ Bakrasil	<ul style="list-style-type: none"> <li>Renovation of staggered trench is required.</li> <li>VSS should be linkage to protection.</li> <li>Local people are very aware of protection of forest which is reflected in the higher density of the same.</li> <li>Mounds formation by termites is a big issue which can be controlled by the dept.</li> </ul>	<ul style="list-style-type: none"> <li>Increase in the soil moisture</li> <li>Sighting of wild animals is increased.</li> </ul>
26	Bald Hill Plantation / Kalahandi North/ Kegaon/ Kirkakani/ Kirkakani	<ul style="list-style-type: none"> <li>2.5-meter space is maintained.</li> <li>Some villagers have got wage opportunity.</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage of the site has increased.</li> <li>The land was previously encroached but after intervention the site was free from encroachment.</li> </ul>



Sl. No	Type of Plantation/ Division/ Range/ Section/ Beat	Observations	Impact of the Plantation Activities
27	Bald Hill Plantation/ Kalahandi North/ Kegaon/ Golamunda/ Bakrasil	<ul style="list-style-type: none"> <li>Trench &amp; Bamboo fencing is observed in lower side of the site.</li> <li>Bubai plantation in lower side which can protected to plantation</li> <li>Dominating species is teak which has increased the green coverage.</li> <li>Most of the trees attacked by Torment and gradually have become dry.</li> <li>Active interference of VSS to protect the plantation site is seen.</li> </ul>	<ul style="list-style-type: none"> <li>Awareness has increased among local people which helped to protect the forest.</li> </ul>
28	Block plantation/ Khariar/ Komna/ Rajana/ Jharnanamal	<ul style="list-style-type: none"> <li>The plantation is done properly, and growth of plants is good.</li> <li>Staggered trench has been done properly.</li> <li>2.5 meter spacing has been maintained.</li> <li>Watch &amp; ward is maintained properly.</li> <li>There is no sign board in the plantation site.</li> </ul>	<ul style="list-style-type: none"> <li>People of the nearby village got wages employment.</li> <li>The nearby villagers got forest produce easily.</li> <li>It helped the cattle in getting ample fodder.</li> </ul>
29	Block plantation/ Kalahandi South/ Biswanathpur/ Biswanathpur/ Dhepaguda	<ul style="list-style-type: none"> <li>Increase in the forest density.</li> <li>Increase in awareness among the people after handed over to VSS.</li> <li>The plantation has taken place under the MWS of Kanhar village.</li> </ul>	<ul style="list-style-type: none"> <li>Increased soil moisture and green coverage in the site.</li> </ul>
30	Block plantation/ Kalahandi South/ Biswanathpur/ Bhimrajpur/ Dhepaguda	<ul style="list-style-type: none"> <li>Natural species like Sidha is grown only in plantation area.</li> <li>Most of the trees affected by termite attacks.</li> </ul>	<ul style="list-style-type: none"> <li>Increase in the soil moisture.</li> <li>Increase in the movement of elephant.</li> </ul>
31	Block plantation / Balangir/ Harisankar/ Dhanamunda/ Ankamura	<ul style="list-style-type: none"> <li>Soil moisture has increased due to better plant growth and SMC work.</li> <li>Khira has been planted to replace casualty.</li> <li>Natural species are Kuruda, Bija, Chena &amp; Kendu has observed in the site.</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage &amp; soil moisture has increased.</li> </ul>
32	Block plantation/ Balangir/ Patnagarh/ Patnagarh/ Paruabhadi	<ul style="list-style-type: none"> <li>Sighting of wild animals has increased.</li> <li>Weeding and cleaning is required in the site.</li> <li>Increase in the consciousness of villagers who have thereafter not allowed the cutting of trees from forest.</li> </ul>	<ul style="list-style-type: none"> <li>As most of the plants planted under the mother trees, the growth rate is not so high</li> <li>Green coverage and density of the trees have increased in the site.</li> </ul>





Sl. No	Type of Plantation/ Division/ Range/ Section/ Beat	Observations	Impact of the Plantation Activities
33	Fruit Bearing Plantation/ Sunabeda Wildlife/ Sunabeda/ Sunenga/ Jalmudi	<ul style="list-style-type: none"> <li>Growth of the plantation is good.</li> <li>SMC structures are also properly made.</li> <li>The watch &amp; ward is also properly done.</li> </ul>	<ul style="list-style-type: none"> <li>People of the nearby village got work and wages.</li> <li>The wild animals got their food easily.</li> </ul>
34	Old Teak management/ Kalahandi South/ Jaipatna/ Jaipatna/ Mukhiguda	<ul style="list-style-type: none"> <li>Increase in the movement of elephants.</li> <li>Most of the teak plants got affected by termites.</li> <li>Illicit felling has decreased.</li> </ul>	<ul style="list-style-type: none"> <li>Illegal cutting is under check.</li> </ul>
35	Outside Working Plan/ Sonepur/ Sonapur/ Sonapur/ Arunapur	<ul style="list-style-type: none"> <li>The SMC structures are done properly.</li> <li>Growth of the plants is not so satisfactory.</li> <li>People of nearby villages got work and grass for their cattle.</li> <li>Soil erosion is checked to a large extent.</li> <li>Cleaning and pruning work is not done properly. The casualty is more.</li> </ul>	<ul style="list-style-type: none"> <li>Soil erosion has decreased.</li> <li>It helped cattle in getting ample fodder.</li> </ul>
36	SSO Bamboo / Khariar Komna/ Rajana/ Kamkeda	<ul style="list-style-type: none"> <li>The champs are cleaned properly.</li> <li>Stone packing has been observed under each champ.</li> <li>Proper care has been taken for new column to grow.</li> </ul>	<ul style="list-style-type: none"> <li>People of the nearby village got work and wages.</li> <li>Soil erosion has decreased.</li> </ul>
37	SSO Bamboo / Sonepur/ Ulunda/ Sindhol/ Padarpalli	<ul style="list-style-type: none"> <li>The clumps are cleaned properly.</li> <li>Stone packing has been observed under each clump.</li> <li>Proper care has been taken for new clumps to grow.</li> </ul>	<ul style="list-style-type: none"> <li>People of the nearby village got work and wages.</li> <li>Soil erosion has decreased.</li> </ul>
38	SSO Bamboo / Kalahandi North/ Kegaon/ Kegaon/ Nuagaon	<ul style="list-style-type: none"> <li>Most of clumps are packing of stone &amp; soil</li> <li>It is found that wild boar has damaged the culms in some of clumps.</li> <li>Every clump has been properly numbered.</li> <li>Density of forest has increased.</li> <li>Congestion removal has been done in the site.</li> </ul>	<ul style="list-style-type: none"> <li>Increased forest density and green cover</li> <li>New regeneration of clumps has been observed in the site.</li> <li>SMC work like half-moon trench, soil packing and stone packing helped to check soil erosion.</li> </ul>



## 6.12 Other assets Evaluated

Table 6.27: List of Sampled out Assets other than Plantation Activities Evaluated

SL.	Other Assets	Balangir	Kalahandi (North)	Kalahandi (South)	Khariar	Sonpur	Sunabeda (WL)	Total
1	Antipoaching Shed						3	3
2	Antipoaching squad			2				2
3	Barak		2		1	2	2	7
4	Boundary wall	1		2				3
5	Causeway	1	2				1	4
6	CC Road			1				1
7	Central Nursery				1			1
8	Check Dam			2				2
9	Common Toilet		2	2				4
10	Culvert	2	1				1	4
11	Earthen Bound			2			1	3
12	Earthen Graded Bound						1	1
13	Elephant Trench							1
14	Forest Guard quarter	2	3	3	4	2		14
15	Range Office						1	1
16	Forest Road	4	2	1				7
17	Forester Quarter cum Office		1	2	1	4		8
18	Gate Operating House						2	2
19	LBCD in Sagada Nala			2				2
20	Malkhana			4	1	2	2	9
21	Midow Development			3			1	4
22	Mega Nursery	2	2					4
23	Midow development			3				3
24	Nursery Shed					2	2	4
25	Para Staff		2					2
26	Range Office	1	2	2	1		1	7
27	Ranger's quarter	1	1	1	2			5
28	Salt Lick			3			1	4
29	Secrete Groves	2	2	0				4
30	Size yard	2					1	3
31	Staff Barak			2				2
32	Tube well			2				2
33	VHF Tower			1				1
34	Barbed wire Fencing						1	1
35	Water Body	5	3	3	1		3	15





SL.	Other Assets	Balangir	Kalahandi (North)	Kalahandi (South)	Khariar	Sonpur	Sunabeda (WL)	Total
36	Wooden Bridge			1				1
37	Zoo management	1						1
	Grand Total	24	25	44	12	12	24	141

Table 6.28: Usability of Building:

SL. No	Site/ Division/ Range/ Section/ Beat	Current status/ Observation	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
1	Range office Khariar Range, Khariar Section & Khariar beat of Khariar Division	<ul style="list-style-type: none"> <li>Official purpose use</li> </ul>	<ul style="list-style-type: none"> <li>Forest work is being managed easily.</li> <li>Direct supervision of the Range officer becomes easier.</li> <li>Information sharing became easy within a short period of time</li> </ul>	8	High
2	Forest Guard quarter Jholapathar beat, Sanamaheswar, Kharia Range of Khariar Division	<ul style="list-style-type: none"> <li>Official use of the Forest guard</li> </ul>	<ul style="list-style-type: none"> <li>It has made the Forest guards to perform their works easily from the forest itself not only in plantation, but also check the stealing of forest products.</li> </ul>	7	Medium
3	Forester's Office cum Residence Jholapathar beat, Sanamaheswar Section, Khariar Range of Khariar Division	<ul style="list-style-type: none"> <li>Residence &amp; office of the Forester</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forester to stay and perform his office &amp; supervision work from the forest area in a better manner.</li> </ul>	8	High
4	Forest Guard quarter, Kharabadi beat, Ranimunda Section, Khariar Range of Khariar Division	<ul style="list-style-type: none"> <li>Residence of the Forest guard</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forest guard to stay in the forest itself and could afford more time towards the Forest development work</li> </ul>	7	Medium
5	Range's quarter Komna beat, Komna Sectin, Komra Range of Khariar Division	<ul style="list-style-type: none"> <li>Residence of the Range officer</li> </ul>	<ul style="list-style-type: none"> <li>It enabled the Range officer to stay nearer to his own forest area and perform his duty in a better manner.</li> </ul>	8	High
6	Ranger's quarter, Nuapada beat, Nuapada Section, Nuapada Range of Khariar Division	<ul style="list-style-type: none"> <li>Residence of the Range officer</li> </ul>	<ul style="list-style-type: none"> <li>It enabled the Range officer to stay nearer to his own forest area and perform his duty in a better manner.</li> </ul>	8	High



SL. No	Site/ Division/ Range/ Section/ Beat	Current status/ Observation	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
7	Barrak, Nuapad beat, Nuapada Section, Nuapada Range of Khariar Division	<ul style="list-style-type: none"> <li>As residence of Anti-poaching squared and staffs mint for Watch&amp; ward</li> </ul>	<ul style="list-style-type: none"> <li>It helps a lot to the Forest staffs, checking and poaching sward to stay near the field and perform their duties intime.</li> </ul>	9	High
8	Ranger's quarter, Ulunda beat, Ulunda Section, Ulunda Range of Sonpur Division	<ul style="list-style-type: none"> <li>Residence of the Range officer</li> </ul>	<ul style="list-style-type: none"> <li>It enabled the Range officer to stay nearer to his own forest area and perform his duty in a better manner.</li> </ul>	8	High
9	Forester's Office cum Residence, Ulunda beat, Ulunda Section, Ulunda Range of Sonapur Division	<ul style="list-style-type: none"> <li>Residence &amp; office of the Forester</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forester to stay and perform his office &amp; supervision work from the forest area in a better manner.</li> </ul>	7	Medium
10	Barrak, Ulunda beat, Ulunda Section, Ulunda Range of Sonapur Division	<ul style="list-style-type: none"> <li>As residence of Anti-poaching squad and staffs meant for Watch&amp; ward</li> </ul>	<ul style="list-style-type: none"> <li>It helps a lot to the Forest staffs, checking and poaching squad to stay near the field and perform their duties better.</li> </ul>	8	High
11	Forest Guard quarter, Duleswar beat, Dhurdhura Section, Biramaharajpur of Sonapur Division	<ul style="list-style-type: none"> <li>Residence of the Forest guard</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forest guard to stay in the forest itself and could afford more time towards the Forest development work</li> </ul>	7	Medium
12	Forester's Residence, Kuleswar beat, Dhurdura Section, Birmaharajpur Range of Sonapur Division	<ul style="list-style-type: none"> <li>Convenient and operate smoothly</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forester to stay and perform his office &amp; supervision work from the forest area in a better manner.</li> </ul>	7	Medium
13	Ranger's Residence, Birmaharajpur beat, Birmaharajpur Sectin, Birmaharajpur Range of Sonapur Division	<ul style="list-style-type: none"> <li>Convenient and operate smoothly</li> </ul>	<ul style="list-style-type: none"> <li>Helped the Range officer to stay nearer to his own forest area and perform his duty in a better manner.</li> <li>Improved staff coordination and effective implementation of forest activities made easy.</li> </ul>	9	High





SL. No	Site/ Division/ Range/ Section/ Beat	Current status/ Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
14	Range Office, Birmaharajpur beat, Birmaharaj Section, Birmaharaj Range of Sonapur Division	<ul style="list-style-type: none"> <li>Official operate</li> </ul>	<ul style="list-style-type: none"> <li>The forest work has been managed easily. The direct supervision of the Range officer could be done easily. Information sharing became easy within a short period of time.</li> </ul>	8	High
15	Barrak, Birmaharajpur beat, Bhimrajpur Section, Bhimrajpur Range of Sonapur Division	<ul style="list-style-type: none"> <li>As residence of Anti-poaching squad and staffs meant for Watch&amp; ward</li> </ul>	<ul style="list-style-type: none"> <li>It helps a lot to the Forest staffs, checking and poaching squad to stay near the field and perform their duties in time.</li> </ul>	8	High
16	Gate operating house, Cherchuan beat, Cherchuan Section, Komna WL Range of Sunabeda WL	<ul style="list-style-type: none"> <li>The Office of the Operator of the Forest gate of R.F.</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forest staff to stay and operate the gate in a proper manner. It is a single room constructed</li> </ul>	7	Medium
17	Range office, Komna beat, Komna Section, Komna WL Range of Sunabeda WL	<ul style="list-style-type: none"> <li>FOR OFFICE PURPOSES</li> </ul>	<ul style="list-style-type: none"> <li>The forest work has been managed easily. The direct supervision of the Range officer could be done easily. Information sharing became easy within a short period of time.</li> </ul>	8	High
18	Barrack, Komna beat, Komna Section, Komna WL Range of Sunabeda WL	<ul style="list-style-type: none"> <li>As residence of Anti-poaching squad and staffs meant for Watch&amp; ward</li> </ul>	<ul style="list-style-type: none"> <li>Helped a lot to the Forest staffs, checking and poaching squad to stay near the field and perform their duties in time.</li> </ul>	9	High
19	Barrack, Nuapada beat, Nuapada Section, Nuapada WL of Sunabeda WL Division	<ul style="list-style-type: none"> <li>As residence of Anti-poaching squad and staffs mint for Watch&amp; ward</li> </ul>	<ul style="list-style-type: none"> <li>Helped a lot to the Forest staffs, checking and poaching squad to stay near the field and perform their duties in time.</li> </ul>	8	High
20	Forester Range Office, Nuapada beat, Nuapada Section, Nuapada WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>Operated the office smoothly</li> </ul>	<ul style="list-style-type: none"> <li>The forest work has been managed easily. The direct supervision of the Range officer could be done easily. Information sharing became easy within a short period of time.</li> </ul>	8	High



SL. No	Site/ Division/ Range/ Section/ Beat	Current status/ Observation	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
21	Forest Guard quarter, Sagada beat, Sagada Section, Karlapata Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Occupied by 3 Guard</li> </ul>	<ul style="list-style-type: none"> <li>Jointly staying by 3 FG and do their duty separately</li> <li>Improved team work</li> </ul>	8	High
22	Forest Guard quarter, Sagada beat, Sagada Section, Karlapata Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Staying the Sagada Forester</li> </ul>	<ul style="list-style-type: none"> <li>It indicates the presence of Guard in their core area</li> </ul>	8	High
23	Range office, Saisurini beat, Saisurini Section, Th. Rampur, Noth of Kalahandi South Division	<ul style="list-style-type: none"> <li>Operating the Th. Rampur(N) Range office regularly</li> </ul>	<ul style="list-style-type: none"> <li>No impact</li> </ul>	6	Medium
24	Ranger's Residence, Birmaharajpur beat, Birmaharajpur Sectin, Th.Rampur Range of Sonapur Division	<ul style="list-style-type: none"> <li>Occupied by Ranger</li> <li>All facilities available as per norms</li> </ul>	<ul style="list-style-type: none"> <li>Convenient to stay here comparatively previous settlement</li> <li>Coordination of staff and implementation of activities become easy easy and smooth.</li> </ul>	8	High
25	Range Office, Saisurini beat, Saisurini Section, Th. Rampur (S) Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Used as RO Office activities</li> </ul>	<ul style="list-style-type: none"> <li>The forest work has been managed easily</li> <li>The direct supervision of the Range officer could be done easily. Information sharing became easy within a short period of time.</li> </ul>	8	High
26	Forester Office cum quarter, Saisurini beat, Saisurini Section, Th. Rampur(S) of Kalahandi south Division	<ul style="list-style-type: none"> <li>Office cum Residence</li> </ul>	<ul style="list-style-type: none"> <li>Become for timely accomplishment of office and plantation works.</li> </ul>	8	High
27	Forester quarter, Mahupatna beat, Benakhaman Section, Jaipatna Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Mahulpatna Forester is Staying</li> </ul>	<ul style="list-style-type: none"> <li>Become easy for office and plantation works.</li> </ul>	7	Medium





SL. No	Site/ Division/ Range/ Section/ Beat	Current status/ Observation	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
28	Forest Guard quarter, Mahulpatna beat, Benakhmar Section, Jaipatna Range of Kalahandi south Division	<ul style="list-style-type: none"> <li>Used for Residential purpose</li> </ul>	<ul style="list-style-type: none"> <li>Became convenient for Forest Guard to perform his duty and visit the plantation sites regularly.</li> </ul>	7	Medium
29	Range office, Kesinga beat, Kesinga Section, Kesinga Range, Kalahadi North Division	<ul style="list-style-type: none"> <li>Operating the Range office</li> </ul>	<ul style="list-style-type: none"> <li>Convenient to operate the day to day office work with better staff coordination and close supervision of plantation activity.</li> </ul>	8	High
30	Forest Guard quarter, Kesinga beat, Kesinga Section, Kesinga Range of Kalahandi North Division	<ul style="list-style-type: none"> <li>Occupied by Kesinga Forester</li> </ul>	<ul style="list-style-type: none"> <li>Now became convenient to stay and do the duty perfectly near to his site.</li> </ul>	8	High
31	Renger's Residence, Kesinga beat, Kesinga Section, Kesinga Range of Kalahandi North Division	<ul style="list-style-type: none"> <li>Occupied by Ranger</li> </ul>	<ul style="list-style-type: none"> <li>Residence is separate which is convenient to stay.</li> <li>It has helped the range officer to work more efficiently.</li> </ul>	8	High
32	Range office, Purunapada beat, Bhawanipatna Section, Bhawanipatna Range of Kalahandi North Division	<ul style="list-style-type: none"> <li>Not operated in full phase due to newly constructed building</li> </ul>		3	Low
33	Barak, Purunapada beat, Bhawanipatna Section, Bhawanipatna Range of Kalahandi North Division	<ul style="list-style-type: none"> <li>Regular staying of Para staff</li> </ul>	<ul style="list-style-type: none"> <li>Adequate space available to accommodate at least 8 to 10 persons, but earlier they adjusted in other building. The intervention promoted team spirit.</li> </ul>	7	Medium



SL. No	Site/ Division/ Range/ Section/ Beat	Current status/ Observation	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
34	Forester quarter, Sanpur beat, Sanpur Section, Bhawanipatna Range of Kalahandi North Division	<ul style="list-style-type: none"> <li>Occupied by Sanpur forester last one year</li> </ul>	<ul style="list-style-type: none"> <li>It has become convenient to stay in all seasons and perform duties effectively.</li> </ul>	8	High
35	Forest Guard quarter, Sanpur beat, Sanpur Section, Bhawanipatna Range of Kalahandi North Division	<ul style="list-style-type: none"> <li>Presently Sanpur 'A' &amp; 'B' both are staying</li> </ul>	<ul style="list-style-type: none"> <li>It is more convenient to stay in all seasons and undertake forest activities.</li> </ul>	8	High
36	Range office, Khaprakhol beat, Khaprakhol Section, Harsankar Range of Balangir Division	<ul style="list-style-type: none"> <li>Operating Office of the Ranger</li> </ul>	<ul style="list-style-type: none"> <li>Earlier the range was operating from a old building which was not convenient where all facilities were not available. Now it is convenient to operate day to work smoothly.</li> </ul>	9	High
37	Forester Guard quarter, Khaprakhol beat, Khaprakhol Section, Harsankar Range of Balangir Division	<ul style="list-style-type: none"> <li>Residential use</li> </ul>	<ul style="list-style-type: none"> <li>Convenient to stay here in all season which was not available in previous place. It has helped the forest guard to give more time in the plantation sites.</li> </ul>	8	High
38	Ranger's Residence, Khaprakhol beat, Khaprakhol Section, Harsankar Range of Balangir Division	<ul style="list-style-type: none"> <li>Occupied by ranger</li> </ul>	<ul style="list-style-type: none"> <li>It has become more convenient to undertake office and field work.</li> </ul>	9	High
39	Forest Guard quarter, Bandhapada beat, Bandhapada Section, Patnagarh Range of Balangir Division	<ul style="list-style-type: none"> <li>Currently Badhapada Forest guard is staying in the FG quarter.</li> </ul>	<ul style="list-style-type: none"> <li>Previously staying at old guard quarter which was not convenient to stay.</li> <li>Presently giving more time for plantation activities made easy.</li> </ul>	8	High





Table 6.29: Usability of Road, Culvert, Causeway &amp; Bridge

SL. No	Site/ Division/ Range/ Section/ Beat	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality of Assets
1	Culvert, Pandripani beat, Dharamunda Section, Nuapada WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>To smoothen the communication by road</li> </ul>	<ul style="list-style-type: none"> <li>It helped the people to pass over the stream.</li> </ul>	8	High
2	Causeway, Bhausil beat, Katinapani Section, Nuapada WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>To smoothen the communication by road</li> </ul>	<ul style="list-style-type: none"> <li>Improved communication facilities for people and wild animals ensured.</li> </ul>	8	High
3	Wooden Bridge, Jakam beat, Sagada Section, Karlapat Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>All type of vehicles run over the bridge</li> </ul>	<ul style="list-style-type: none"> <li>Easily communicated by Jakam villagers.</li> </ul>	10	High
4	Forest Road, Jakam beat, Sagada Section, Karlapat Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>All weather Road</li> </ul>	<ul style="list-style-type: none"> <li>Better access to road communication.</li> </ul>	7	Medium
5	CC Road, Jakam-A beat, Jakam Section, Karlapat Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Communication</li> </ul>	<ul style="list-style-type: none"> <li>Controlled the soil erosion in rain season.</li> </ul>	8	High
6	Causeway, Gigina beat, Rupra Road Section, Kesinga Range of Kalahandi North Division	<ul style="list-style-type: none"> <li>Ventilated excesses rain water over the causeway.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced the top soil erosion.</li> </ul>	9	High
7	Forest Road, Gigina beat, Rupra Road Section, Kesinga Range of Kalahandi North Division	<ul style="list-style-type: none"> <li>Used by forest department and local villagers in all season</li> <li>Condition of road is not so good</li> </ul>	<ul style="list-style-type: none"> <li>Easy to access market by local villagers due to availability all weather road.</li> </ul>	3	Low
8	Culvert, Gigina beat, Rupra Road Section, Kesinga Range of Kalahandi North Division	<ul style="list-style-type: none"> <li>Easily pass away by vehicle in all season</li> </ul>	<ul style="list-style-type: none"> <li>Transport communication for forest and local people.</li> </ul>	8	High



SL. No	Site/ Division/ Range/ Section/ Beat	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
9	Culvert, Nandupada beat, Khaprakhol Section, Harsankar Range of Balangir Division	<ul style="list-style-type: none"> <li>Connected to Harisankar Nandupada village</li> </ul>	<ul style="list-style-type: none"> <li>Improved communication facilities from Harisankar to Samura Village.</li> </ul>	8	High
10	Forest Road, Nandupada beat, Khaprakhol Section, Harisankar Range of Balangir Division	<ul style="list-style-type: none"> <li>It is used for forest patrolling and movement into the forest fringes</li> <li>As the forest road is repaired from Harishankar to Sampada, the movement and patrolling of staff is easy in this route</li> </ul>	<ul style="list-style-type: none"> <li>Facilitated tracking of the poaching activities.</li> </ul>	8	High
11	Causeway, Desand beat, Bandhapada Section, Patnagarh Range of Balangir Division	<ul style="list-style-type: none"> <li>Situated in forest road from Pipaldabur to Desand village</li> </ul>	<ul style="list-style-type: none"> <li>Improved communication in all seasons for local people and forest staff.</li> </ul>	7	Medium
12	Forest Road, Desand beat, Bandhapada Section, Patnagarh Range of Balangir Division	<ul style="list-style-type: none"> <li>Used for by 3 to 4 villages</li> </ul>	<ul style="list-style-type: none"> <li>Easy accesses to Patnagarh in all seasons.</li> </ul>	7	Medium

Table 6.30: usability of Sizeryard, Malkhana &amp; other wild life management assets

SL. No	Site/ Division/ Range/ Section/ Beat	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
1	Malkhana, Khariar beat, Khariar Section, Khariar Range of Khariar Division	<ul style="list-style-type: none"> <li>Storage the office materials</li> </ul>	<ul style="list-style-type: none"> <li>It has become easy to store seized articles as wells materials of the office, meant for plantation and other purposes.</li> </ul>	8	High
2	Elephant Foot Trench, S.Patharpali beat, Sindhol Section, Ulunda Range of Sonpur Division	<ul style="list-style-type: none"> <li>Constructed to prevent Elephants to go to the nearby village area</li> </ul>	<ul style="list-style-type: none"> <li>Controlled elephant entry to village area and caused damage.</li> </ul>	8	High





SL. No	Site/ Division/ Range/ Section/ Beat	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
3	Malkhana, Ulunda beat, Ulunda Section, Ulunda Range of Sonapur Division	<ul style="list-style-type: none"> <li>Storage the materials of office</li> </ul>	<ul style="list-style-type: none"> <li>Become easy to store seized articles as wells materials of the office, meant for plantation and other purposes.</li> </ul>	8	High
4	Malkhana, Birmaharajpur beat, Birmaharajpur Section, Birmaharajpur Range of Sonapur Division	<ul style="list-style-type: none"> <li>STORAGE OF MATERIALS OF RANGE</li> </ul>	<ul style="list-style-type: none"> <li>Become easy to store seized articles as wells materials of the office, meant for plantation and other purposes</li> </ul>	8	High
5	Barbed Fencing, Silatpani beat, Silatpani Section, Komna WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>To prevent wild animals like bear, etc to go outside</li> </ul>	<ul style="list-style-type: none"> <li>For this fencing, the wild animals like bear, etc could not go outside forest area and hunters also find difficulty to enter into the forest area. Thus hunting of wild animal reduced.</li> </ul>	8	High
6	Anti-Poaching Shed, Silatpani beat, Silatpani Section, Koma WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>Rest shed of the Anti-poaching squad</li> </ul>	<ul style="list-style-type: none"> <li>Helped the anti-poaching squad to stay during duty hours to perform their duties in proper manner</li> </ul>	6	Medium
7	Malkhana, Komna beat, Komna Section, Komna WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>Storage seized items</li> </ul>	<ul style="list-style-type: none"> <li>Become easy to store seized articles as wells materials of the office, meant for plantation and other purposes</li> </ul>	8	High
8	Seizure Yard, Jolmudi beat, Susenga Section, Sunabeda WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>The seized forest materials are kept</li> </ul>	<ul style="list-style-type: none"> <li>With the help of it, the seized materials are kept with safe and well protected.</li> </ul>	9	High
9	Medow Development, Jolmudi beat, Susenga Section, Sunabeda WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>For the food of the wild animals</li> </ul>	<ul style="list-style-type: none"> <li>Helped the wild animals in getting food inside the forest area.</li> </ul>	8	High
10	Malkhana, Nuapada beat, Nuapada Section, Nuapada WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>Storage the goods of Range office</li> </ul>	<ul style="list-style-type: none"> <li>Become easy to store seized articles as wells materials of the office , meant for plantation and other purposes under safety custodian.</li> </ul>	8	Average



SL. No	Site/ Division/ Range/ Section/ Beat	Observation	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Quality of Assets
11	Salt lick, Jhalrama beat, Sibanarayapur Section, Nuapada WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>Used for the Wild animals</li> </ul>	<ul style="list-style-type: none"> <li>Helped the wild animals in getting necessary minerals.</li> </ul>	8	High
12	Antipoaching sward, Sagada beat, Sagada Section, Karlapat Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Used in multi activities like checking antipoaching activities, tracking elephant movements</li> </ul>	<ul style="list-style-type: none"> <li>Tracking of anti poaching and smuggling activities and tracking of elephant movements made easy.</li> </ul>	9	High
13	VHF Tower, Sagada beat, Sagada Section, Karlapat Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Smoothly connected within 10km. Radiation</li> </ul>	<ul style="list-style-type: none"> <li>Tracing of wild animal movement made easy.</li> </ul>	8	High
14	Antipoaching sward, Sagada beat, Sagada Section, Karlapat Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Engage in malty activities like night patrolling, Fire fitting, Elephant movement tracking and time to time engage other official work as per instruction of nodal officer</li> </ul>	<ul style="list-style-type: none"> <li>Controlled the illegal cutting of trees and reduce the firewood collection.</li> </ul>	8	Low
15	Salt Lick, Jakam beat, Sagada Section, Karlapat Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Local cattle eating salty soil during grazing time</li> </ul>	<ul style="list-style-type: none"> <li>Wild animals got mineral supplements as per their requirement.</li> </ul>	8	High
16	Meadow development, Jakam-A beat, Sagada Section, Karlapat Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Not maintain and only stylo grass raised some where place of Midow</li> </ul>	<ul style="list-style-type: none"> <li>Less availability of fodder for wild animal.</li> </ul>	3	Low
17	Malkhana, Saisurini beat, saisorini Section, Th. Rampur(N) Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Storage of another item</li> </ul>	<ul style="list-style-type: none"> <li>Storage the seized item in safety condition</li> </ul>	7	Medium





SL. No	Site/ Division/ Range/ Section/ Beat	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
18	Staff Barak, Saisurini beat, Saisurini Section, Th. Rampur(S) Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Occupied by staff and squired</li> </ul>	<ul style="list-style-type: none"> <li>Most of para staff and when required other staff are availing accomodation facilities and it helped them to perform their duties in better way.</li> </ul>	7	Medium
19	Malkhana, Jaipatna beat, Jaipatna Section, Jaipantna Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Storage the sized item</li> </ul>	<ul style="list-style-type: none"> <li>Storage the seized item in safe costody.</li> </ul>	8	High
20	Para Staff, Bhawanipatna beat, Bhawanipatna Section, Bhawanipatna Range of Kalahandi Norhth Division	<ul style="list-style-type: none"> <li>Night patrolling, Ant poaching squared, control the fire incident side by side office work when required</li> </ul>	<ul style="list-style-type: none"> <li>Incident of fire and anti poaching events reduced.</li> </ul>	7	Medium
21	Seizure yard, Khaprakhol beat, Khaprakhol Section, Harisankar Range of Kalahandi North South Division	<ul style="list-style-type: none"> <li>Storage sized item like wooden logges, Vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Safety storage of seized logs ensured.</li> </ul>	7	Medium
22	Zoo management, Khaprakhol beat, Khaprakhol Section, Harisankar Range of Kalahandi Division	<ul style="list-style-type: none"> <li>Mostly sported Deer staying in the zoo</li> <li>Rather than S. Deer one Kutra, Peacock &amp; Rabbit also laying of limited nos.</li> </ul>	<ul style="list-style-type: none"> <li>Developed as ..... spot attracts visitors.</li> </ul>	8	High



Table 6.31: Usability of Water body:

SL. No	Site/ Division/ Range/ Section/ Beat	Observation	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
1	Water body, Ainaljaba beat, Lakhana Section, Nuapada Range of Khariar Division	<ul style="list-style-type: none"> <li>The water body is constructed with well-built bond, perennial water availability, the location is easily access to wild animals</li> </ul>	<ul style="list-style-type: none"> <li>The wild animals got drinking water source.</li> </ul>	8	High
2	Water body, Dhuldhula beat, Ulunda Section, Ulunda Range of Sonepur Division	<ul style="list-style-type: none"> <li>The water body is constructed with well-built bond, perineal water availability, the location is easily access to wild animals</li> </ul>	<ul style="list-style-type: none"> <li>Availability of water for wild animal use.</li> </ul>	8	High
3	Water body, Sergada beat, Subalaya Section, Birmaharajpur Range of Sonepur Division	<ul style="list-style-type: none"> <li>The water body is constructed with well-built bond, perennial water availability, the location is easily access to wild animals</li> </ul>	<ul style="list-style-type: none"> <li>The Tank has been constructed near to the forest area and helped the wild animals to drink water.</li> </ul>	8	High
4	Water body, Silatpani beat, Silatpani Section, Komna WL Range of Sunabeda WL Divison	<ul style="list-style-type: none"> <li>The water body is constructed with well-built bond, perennial water availability, the location is easily access to wild animals</li> </ul>	<ul style="list-style-type: none"> <li>The Tank has been constructed in the forest area enabling the wild animals to drink water.</li> </ul>	7	Medium
5	Earthen Bond, Cherchuan beat, Cherchuan Section, Komna WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>The mud &amp; stone packed wall has been seen</li> </ul>	<ul style="list-style-type: none"> <li>Checked the soil erosion and flow of rain water</li> <li>It also prevents the wild animals to go outside from RF.</li> </ul>	8	High





SL. No	Site/ Division/ Range/ Section/ Beat	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
6	Water body, Jojmundi beat, Susenga Section, Sunabeda WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>The water body is constructed with well-built bond, perennial water availability, The location is easily access to wild animals</li> </ul>	<ul style="list-style-type: none"> <li>Availability of water for wild animals for drinking and bathing purposes.</li> </ul>	8	High
7	Earthen graded Bond, Susenga beat, Susenga Section, Sunabeda WL, Range of Sunabeda Division	<ul style="list-style-type: none"> <li>The mud &amp; stone packed wall has been seen</li> </ul>	<ul style="list-style-type: none"> <li>Checked the soil erosion, flow away of water. It also prevents the wild animals to go outside the RF.</li> </ul>	8	High
8	Water body, Adara beat, Dharbandha Section, Nuapada WL Range of Sunabeda WL Division	<ul style="list-style-type: none"> <li>The water body is constructed with well-built bond, perennial water availability.</li> <li>The location is easily access to wild animals</li> </ul>	<ul style="list-style-type: none"> <li>The Tank has been constructed in the forest area enabling the wild animals to drink water.</li> </ul>	9	High
9	Check Dam, Jakam beat, Sagada Section, Karlapat Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>It can't control the flood water due to partly broken of the dam</li> </ul>	<ul style="list-style-type: none"> <li>Increase the soil moisture</li> </ul>	5	Medium
10	Water body, Jakam beat, Sagada Division, Karlapat Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Water available only rain season</li> </ul>	<ul style="list-style-type: none"> <li>No impact</li> </ul>	2	Low
11	Earthen bond, Th. Rampur beat, Th. Rampur Section, Th. Rampur(S) Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>3 to 4 feet. Height with storage water for 4 to 5 months</li> </ul>	<ul style="list-style-type: none"> <li>Availability of water for Wild Animal use.</li> </ul>	6	Medium
12	Tubewell, Mahulpatna beat, Benakhmar Section, Jaipatna Range of Kalahandi South Division	<ul style="list-style-type: none"> <li>Tube well is functioning and pumping water round the year.</li> </ul>	<ul style="list-style-type: none"> <li>Safe drinking water available in walkable distance easy reach.</li> </ul>	9	High



SL. No	Site/ Division/ Range/ Section/ Beat	Observation	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Quality of Assets
13	Water Body: Burat beat, Sanpur Section, Bhawanipatna Range of Kalahandi south Division	<ul style="list-style-type: none"> <li>2 to 3mtr. Water available throughout the year</li> </ul>	<ul style="list-style-type: none"> <li>Helped for pisciculture and promoting of livelihood.</li> <li>Round the year people get water for bathing and clearing poupose.</li> </ul>	8	High
14	Water body: Goelmunda beat, Patnagarh Section, Patnagarh Range of Balangir Division	<ul style="list-style-type: none"> <li>Only 6 to 7 months water is available, Inlet was there and also entrance slope for animal is available.</li> </ul>	<ul style="list-style-type: none"> <li>No such impact observed due to water scarcity</li> </ul>	3	Low
15	Water body: Balangir-II beat, Balangir-I Section, Balangir Range of Balangir Divison	<ul style="list-style-type: none"> <li>No inlet and out let due to more silted during rain</li> </ul>	<ul style="list-style-type: none"> <li>In rainy season less access of wild animals due to absence of ramp in the water body.</li> </ul>	3	Low





Table 6.32: Usability of Nursery under CAMPA

SL. No	Site/ Division/ Range/ Section/ Beat	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality of Assets
1	Central Nursery; Bhhata beat, Rajana Section, Komna Range of Khariar Division	<ul style="list-style-type: none"> <li>A well-furnished Nursery with boundary wall, office room, water tank, compost pit, electricity, etc are available</li> </ul>	<ul style="list-style-type: none"> <li>Supply of quality planting materials to the forest area in time with less transportation cost.</li> </ul>	8	High
2	Mega Nursery: Sirliguda beat, Bhawanipatna Section, Bhawanipatna Range of Kanalahandi North Division	<ul style="list-style-type: none"> <li>i) 80% land used as seedling raise and all type nursery shed has been developed</li> <li>All type of infrastructure exists like Water shed, storage room, seed godown, Compost godown, Vermin unit, Seed treatment tank, drying yard, WHS, CC Road, Labour shed etc.</li> </ul>	<ul style="list-style-type: none"> <li>Seedlings raised and supplied as per plantation requirements of different sites.</li> <li>Vermin compost also prepared supplied and used for raising healthy seedlings.</li> </ul>	8	High
3	Mega Nursery, Balangir-II beat, Balangir-I Section, Balangir Range of Balangir Division	<ul style="list-style-type: none"> <li>Cattering to the plantation requirements of different sites.</li> </ul>	<ul style="list-style-type: none"> <li>1.80 lakh qality seedlings produced and planted in different sites. Availability quality planting materials as per need.</li> </ul>	8	High

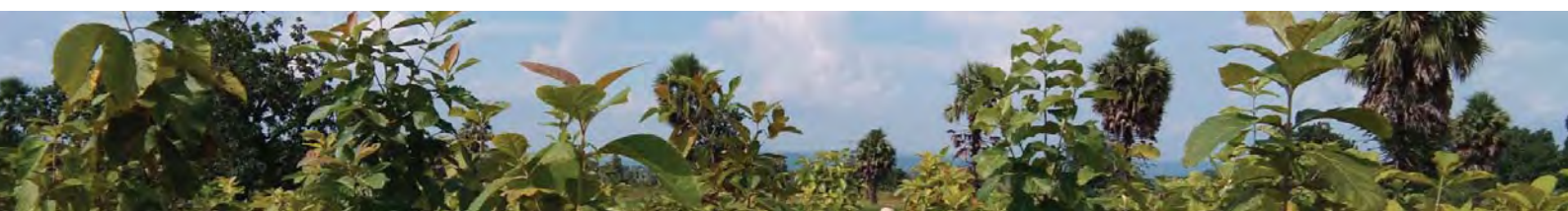


Table 6.33: Usability of Secret groves

SL. No	Site/ Division/ Range/ Section/ Beat	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality of Assets
1	Sacred Groves, Biswanathpur beat, Biswanathpur Section, Biswanathpur Range of Kalahandi North Division	<ul style="list-style-type: none"> <li>Once in a year it has used</li> </ul>	<ul style="list-style-type: none"> <li>To some extent people aware about forest and benefit of planting trees.</li> </ul>	3	Low
2	Scared Groves, Dhuamura beat, Balangir-I Section, Balangir Range of Balangir Division	<ul style="list-style-type: none"> <li>One worship place platform and one tube well has been installation within the campus</li> </ul>	<ul style="list-style-type: none"> <li>Critical awareness among people on afforestation.</li> </ul>	8	High

### 6.13 Summary of findings:

- Out of the total plantation sites, majority of plantation activities are created in the year 2015-16 followed by 2016-17 and 2014-15.
- The average area under plantation is calculated at 22.2 hectares. Compared to the overall average area of plantation, the average area under block plantations is found higher.
- There are about 33 varieties of different species witnessed in all types of plantations evaluated. Intensity of teak is found to be the maximum and there are about 5303 teak trees for every 10000-trees planted under CAMPA.
- On the basis of survival percentage, the performance of AJY plantation, bald hills plantation is found 'high'; the performance of block plantation and OWP plantation is found 'medium' and the performance of avenue plantation is 'low'.
- Across plantation categories, canopy coverage stands highest for avenue plantation followed by block plantation and OWP plantation.
- The performance of all types of plantations on the basis of height is found 'high'. On the other hand, performance of plantations on the basis of GBH/GCH, except OWP plantation, is found 'high'. The performance of OWP plantation on the basis of GBH/GCH is found medium.
- The average area per ANR with gap plantation site is 88.2 hectares.
- Plantation under ANR with gap plantation was undertaken in relatively bigger patches with block plantation mode of spacing between trees. There is overall survival of 89.8 percent and 10.3 percent casualty.
- The overall canopy coverage for ANR with gap plantation considering all the years and all divisions is found at 43.3 percent.
- Overall height and GBH/GCH performance considering all ANR with gap plantations across forest divisions in Klahandi circle are found at 0.4 metre and 1.4 CMs respectively.
- The performance of SSO activities for bamboo forest on the basis canopy performance is overall





found 42.7 percent.

- On an average, there are 66 clumps per hectare of forest area and there is no damage of clumps on the basis of sample plots data. The number of first year culms, second year culms and more than two years culms per hectare of forest area are found at 330, 396 and 594 respectively.
- SMC works are created on about 92.3 percent of plantation sites.
- Overall about 49 percent of the plantation sites have single SMC works, and about 38.5 percent of the plantation sites have two SMC works on plantation sites.
- Only about 4.8 percent of the sites have three types of SMC works on plantation sites.
- All of SSO bamboo sites have two types of SMC works.
- Overall about 77.9 percent of the plantation sites are found with staggered trenches. Percolation pits are found only in ANR with gap plantation of Kalhandi South forest division. Stone packing are found with SSO bamboo operations.
- The overall silt deposit for different SMC structures is found at 46 percent.
- Externalities of water bodies created under CAMPFA are felt by the immediate neighbourhood community in addition to the benefits to wild animals.
- Plantation journals are maintained for all of the AR Plantation activities.
- About 90 percent of the overall sample plantation activities comprises of AR plantation activities for which plantation journals are maintained.
- However, only 66.3 percent of plantain sites maintained it fully. Remaining 23.1 percent maintained it partially and about 10.6 percent don't maintain it.
- Plantation maps are maintained by 86.5 percent of the sites. Micro Plans are prepared under plantation programmes carried out under "Ama Jungle Yojana" only.
- Three out of four AJY VSSs reported their respective involvements at various stages of plantation development.
- All the VSSs adhere to project implementation plans. All the VSSs maintain good relationship and cooperation with department people.
- Due to CAMPFA support, status of plantation is found to have been improved in all the VSS areas, and frequency of forest fire incidences is rarely witnessed, there is no Podu cultivation which was practiced by the villagers previously.
- Frequency of human animal conflict is rarely reported due to AJY.
- The construction quality of all type of buildings are observed to be good and on the basis of usability and impacts, all the infrastructure facilities are found relevant and efficient.
- Due to creation of quarter facilities, the productivity of employees has tended to increase.
- Infrastructure like seedling yard, compost pit, mixing yard, store house, seedling beds etc. are found.
- All of the available facilities inside mega nursery were found well maintained.



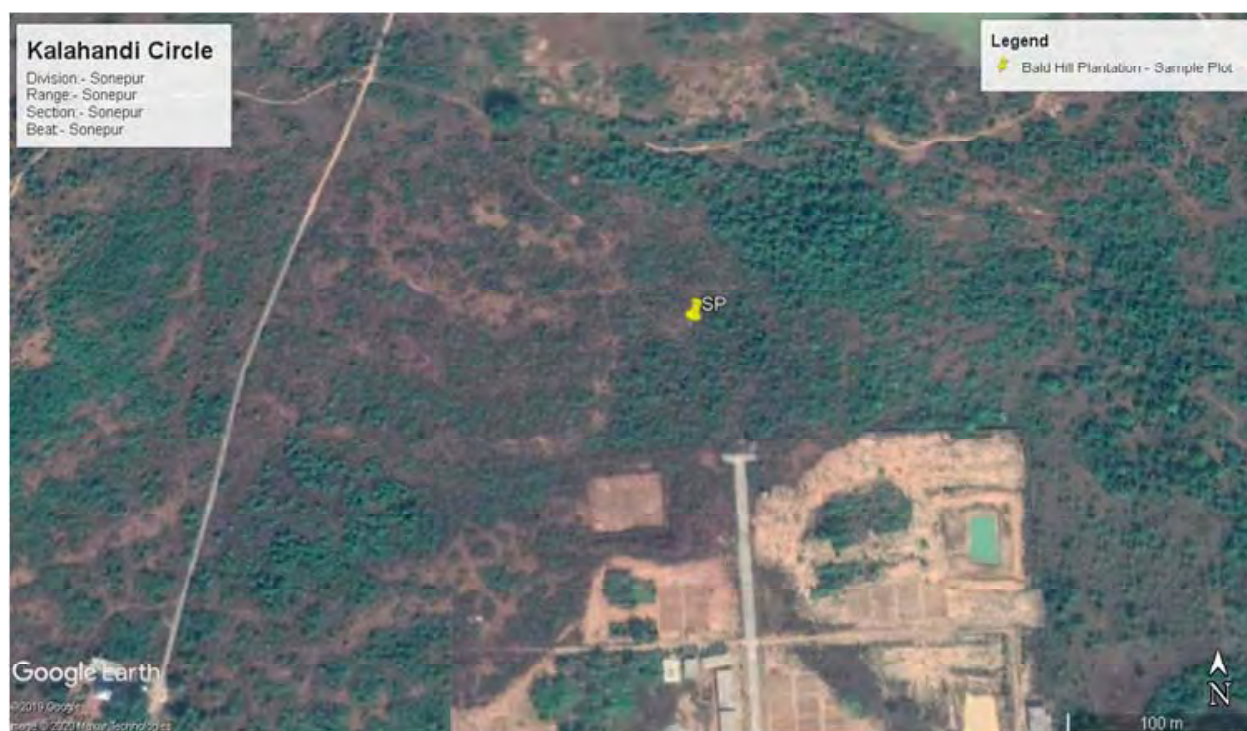
### 6.14 Suggestions of Bhawanipatna Circle:

- Monitoring and supervision by Drone maps may be introduced for better monitoring of plantation sites as well as other activities.
- Local VSSs should necessarily be involved for Protection of plantation sites.
- There should be periodic termite treatment measures against termite attack to Teak trees in various plantation sites.
- The decision for type of trees to be planted should be based on soil & moisture status of plantation sites.
- Regarding quality planting materials, efforts may be directed for germinating from best quality seeds from indigenous mother trees.
- As a protection measure, it is viewed that there should be barbed weir fencing which is more cost effective rather than the watch and word provision for 3years as per norms.
- Root trainer seedling technology is viewed to be one of the best practices in Junagarh Mega Nursery which may be recommended to other nurseries also.
- Survival & growth rate of trees in “Khalia Soil” is viewed to be very low.
- Before plantation digging of 1mtr. Pit and adding manure and soil in the pit is observed more effective by comparing the status of seedlings and saplings at different nursery conditions.
- Maintenance provision in case of building should be recommended under CAMPA.
- Orientation of Para staff/protection squad in forest extension aspects may be considered under regular CAMPA APOs.
- Wall writing should be mentioned in each and every building so as to identify the asset as created under CAMPA. In order to give uniqueness to the assets created under CAMPA, a common colouring of the buildings across forest divisions may be considered

### 6.15 Satellite Imagery of Sample plots



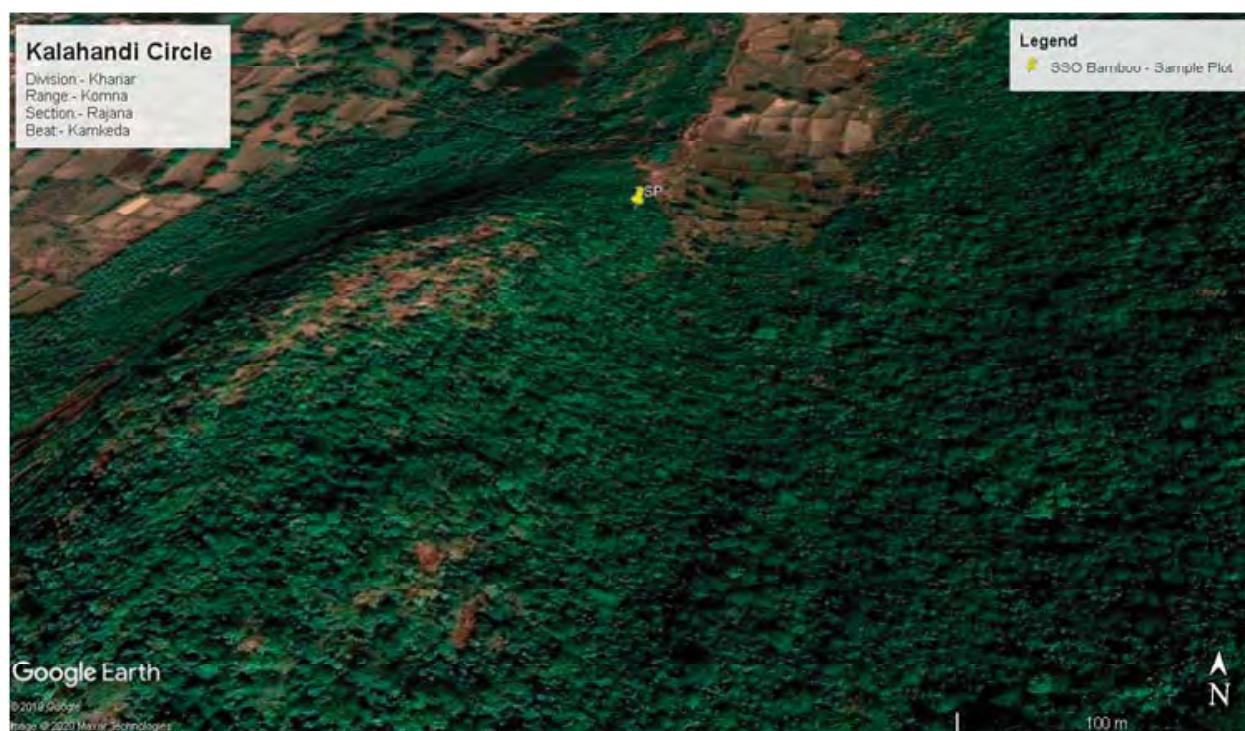












## ANNEXURE- I

## Average and GBH/GCH of trees by year of Plantation

Row Labels	Average of Max Height in Metre	Average of Min Height in Metre	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average Height (in Metre)	Average GBH/GCH (in CMs)
Acacia auriculiformis	4.4	2.0	17.0	7.0	3.2	5.1
2009-10	6.0		22.0		3.0	1.5
2014-15	3.7	2.0	14.5	7.0	2.9	4.9
Amla	2.6	1.4	11.7	6.9	2.0	4.5
2009-10	2.6	1.8	12.7	12.5	2.2	7.4
2014-15	2.7	1.8	11.4	8.0	2.3	5.1
2015-16	1.2	1.0	14.0	5.0	1.1	3.1
2016-17	2.8	1.0	11.2	4.5	1.9	3.2
Arjuna	1.9	1.0	9.3	4.2	1.5	2.8
2011-12	5.4		22.0		2.7	1.4
2014-15	1.2	0.9	7.0	5.0	1.1	3.0
2015-16	2.3	2.2	7.0	4.0	2.3	3.1
2016-17	1.3	0.8	6.5	3.5	1.1	2.3
Babul	2.3	1.0	7.0	4.0	1.7	2.8
2016-17	2.3	1.0	7.0	4.0	1.7	2.8
Badachakunda	3.8	2.5	15.9	10.5	3.2	6.8
2009-10	13.0	10.5	58.5	45.5	11.8	28.6
2014-15	3.1	2.1	11.8	8.0	2.6	5.3
2015-16	3.1	1.7	11.9	6.6	2.4	4.5
2016-17	2.1	1.0	8.0	3.8	1.6	2.7
Bahada	2.5	1.0	7.0	4.0	1.8	2.9
2016-17	2.5	1.0	7.0	4.0	1.8	2.9
Balai	6.4	2.7	20.5	9.5	4.6	7.0
2010-11	6.2	2.0	20.0	8.0	4.1	6.1
2011-12	6.5	3.4	21.0	11.0	5.0	8.0
Bamboo	2.1	1.2	8.2	4.7	1.7	3.2
2015-16	1.9	0.8	7.1	4.9	1.4	3.1
2016-17	2.0	1.2	10.7	4.3	1.6	3.0
Bela	1.2	0.8	8.3	7.0	1.0	4.0
2016-17	1.2	0.8	8.3	7.0	1.0	4.0
Bheru	5.9	3.0	21.5	11.5	4.5	8.0
2010-11	5.6	2.0	20.0	10.0	3.8	6.9
2011-12	6.1	4.0	23.0	13.0	5.1	9.0
Cashew	1.7	1.3	16.0	11.3	1.5	6.4
2016-17	1.7	1.3	16.0	11.3	1.5	6.4
Chatiyani	4.0	3.3	27.0	17.0	3.7	10.3





Row Labels	Average of Max Height in Metre	Average of Min Height in Metre	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average Height (in Metre)	Average GBH/GCH (in CMs)
2014-15	4.0	3.3	27.0	17.0	3.7	10.3
Dhaura	6.4	2.3	23.0	13.5	4.4	8.9
2010-11	6.5	2.0	24.0	12.0	4.3	8.1
2011-12	6.3	2.6	22.0	15.0	4.5	9.7
Gambhari	2.8	1.9	16.3	7.8	2.4	5.1
2009-10	5.6	1.0	31.0	13.0	3.3	8.2
2014-15	2.2	2.1	14.0	9.0	2.2	5.6
2015-16	2.8	2.5	11.3	6.8	2.7	4.7
2016-17	2.1	1.2	14.0	6.0	1.7	3.8
Gangatentuli	1.5	0.5	5.0	3.0	1.0	2.0
2016-17	1.5	0.5	5.0	3.0	1.0	2.0
Jamun	1.8	1.4	10.0	9.0	1.6	5.3
2016-17	1.8	1.4	10.0	9.0	1.6	5.3
Karanja	2.2	1.4	11.5	8.0	1.8	4.9
2009-10	1.2	0.6	11.0		0.9	0.5
2014-15	3.3	1.5	12.5	8.5	2.4	5.5
2015-16	1.8	1.4	10.7	7.2	1.6	4.4
2016-17	1.7	1.4	11.5	9.5	1.6	5.5
Kendu	2.5	1.0	7.0	3.0	1.8	2.4
2016-17	2.5	1.0	7.0	3.0	1.8	2.4
Khaira	2.4	1.4	11.7	7.4	1.9	4.7
2009-10	2.2	1.5	11.4	10.2	1.9	6.0
2014-15	2.2	1.6	14.4	11.4	1.9	6.7
2015-16	2.6	1.6	12.0	6.6	2.1	4.4
2016-17	2.4	0.9	9.8	5.1	1.7	3.4
Krushnachuda	10.1	8.0	23.0	18.5	9.1	13.8
2009-10	10.1	8.0	23.0	18.5	9.1	13.8
Mahaneem	1.2	0.9	9.0		1.1	0.5
2016-17	1.2	0.9	9.0		1.1	0.5
Neem	3.7	1.9	13.5	7.8	2.8	5.3
2009-10	9.1	7.0	22.0	18.0	8.1	13.0
2011-12	6.0	3.5	34.0	18.0	4.8	11.4
2014-15	2.4	1.5	10.0	7.7	2.0	4.8
2015-16	3.8	1.4	13.7	6.2	2.6	4.4
2016-17	2.6	1.3	9.6	5.3	2.0	3.6
Neem	9.0	6.5	22.0	17.0	7.8	12.4
2009-10	9.0	6.5	22.0	17.0	7.8	12.4
Phasi	1.4		12.0		0.7	0.4



Row Labels	Average of Max Height in Metre	Average of Min Height in Metre	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average Height (in Metre)	Average GBH/GCH (in CMs)
2014-15	1.8		12.0		0.9	0.5
2016-17	0.9				0.5	0.2
Sanachankunda	3.1	2.6	15.5	12.8	2.9	7.8
2011-12	4.4	4.0	26.0	24.0	4.2	14.1
2015-16	1.9	1.4	13.0	10.5	1.7	6.1
2016-17	3.6	2.9	13.7	10.7	3.3	7.0
Simaruba	2.8	1.1	13.5	6.5	2.0	4.2
2015-16	2.8	1.1	13.5	6.5	2.0	4.2
Sirisa	1.1	0.8	10.0		1.0	0.5
2015-16	1.1	0.8	10.0		1.0	0.5
Sisoo	1.8	0.8	9.4	4.6	1.3	3.0
2014-15	0.9	0.6	7.5	5.0	0.8	2.9
2015-16	3.3	2.1			2.7	1.4
2016-17	2.4	0.9	9.7	4.6	1.7	3.1
Sunari	0.5	0.3			0.4	0.2
2016-17	0.5	0.3			0.4	0.2
Tamarind	0.6	0.5			0.6	0.3
2016-17	0.6	0.5			0.6	0.3
Teak	3.5	2.1	15.8	8.8	2.8	5.8
2009-10	6.8	5.2	32.0	17.8	6.0	11.9
2011-12	5.5	2.9	33.0	11.5	4.2	7.9
2012-13	12.3	6.9	33.0	22.0	9.6	15.8
2014-15	2.7	1.8	13.4	9.5	2.3	5.9
2015-16	2.6	1.3	10.3	6.3	2.0	4.1
2016-17	2.9	1.3	12.0	5.5	2.1	3.8
Grand Total	2.9	1.7	13.5	8.1	2.3	5.2







## CHAPTER - VII







## 7. Evidence of CAMPA Implementation in Bhubaneswar Circle

With the reorganisation of the Forest Department of Government of Odisha, Bhubaneswar Forest Circle was newly created with effect from 1st October 2003. There are nine forest divisions including three territorial forest divisions, five wild life forest divisions and one working plan division. During the period 2009-10 to 2016-17, a number of CAMPA enabled activities were undertaken separately by all of the forest divisions of this circle. Present chapter seeks to establish evidences of CAMPA intervention by analysing outcome performances of all types of assets created under CAMPA. With this purpose, on sample basis different plantation as well as non-plantations assets from three selected forest ranges of each of the forest divisions under Bhubaneswar circle were evaluated during the period October 2019 to January 2020. Section-1 of this chapter analyses the outcome performance of plantation activities and the subsequent section deals outcome performance of other than plantation activities.

### 4.1 Sample Coverage

The outcome analysis of plantation activities is analysed by covering all types of plantation activities done in three sample ranges of each of the forest divisions present in Bhubaneswar circle. The details of sample ranges and sample plantations covered in the study is as per the following table 8.1. Similarly, sampling details of other than plantation activities are provided in table-7.1.

*Table 7.1: Forest Division wise sample ranges and plantation activities*

Sl.	Name of the Division	No of sample plantation sites	Sampled Range	Type of sampled out Plantation Sites
1	Bhadrak W/L Division	-	Chandbali	
			Dhamnagar	
			Bhadrak	
2	Chilika W/L	2	Tangi	Block Plantation
			Rambha	ANR with gap
			Balugaon	
			Satapada	
3	Chandaka W/L	1	Chandaka	
			Bhubaneswar	
			Dampara	Block Plantation
4	Bhubaneswar City Division	2	Mancheswar	Avenue Plantation
			Cuttack	Block Plantation
			Bhubaneswar	
5	Khordha	7	Tangi	Block Plantation-2
				Baldhill
			Ranapur	SSO Timber
				SSO Bamboo
			Khordha	Block Plantation
6	Puri W/L	7		ANR with gap
			Gop	Avenue Plantation-2
			Konarka	Block Plantation-3



Sl.	Name of the Division	No of sample plantation sites	Sampled Range	Type of sampled out Plantation Sites
			Balikhanda	Avenue Plantation
				Block Plantation
7	Rajnagar W/L	5	Rajnagar	Mangrove Plantation
			Mahakalpada	Panel Compensatory Afforestation/CA-2
			Gahirmatha	-
			Kanika	Block Plantation-2
8	Nayagarh	7	Khandapada	Bald hill
				SSO bamboo
			Mahipur	Block Plantation
				ANR with gap
			Odagaon	Block Plantation
				ANR Plantation
				SSO Bamboo
	<b>Total</b>	31 Plantation sites	26 Ranges	14 Block Plantation sites, 4 ANR with gap, 4 Avenue plantations, 2 Bald hill, 1 SSO timber, 3 SSO Bamboo, 1 Mangrove, 2 Panel Compensatory afforestation

Table 7.2: Forest Division wise sample ranges and plantation activities

Activities	Forest Circle wise number of other than Plantation Assets evaluated								
	Bhadrak W/L	Chilika W/L	Chandaka W/L	Bhubaneswar City Circle	Khurda	Puri	Rajnagar W/L	Nayagarh W/L	Total
Forest guard quarter	7	11	1	5	3	2	2	3	34
Forester quarter	1	1	2			2	3	1	10
Ranger quarter	1	1			1	1		1	5
Barrack	3		2	1	2	2	2		12
Range office	1	1	1	1	1	3		3	11
Protection camp/ Para staff qtr.			1		1				2
Watcher Shed/ Protection shed						3	1	0	4
Boundary wall	1	1		2	1	3	2	0	10
Jetty Duck wall	1	0				0	1	0	2
Nursery	1	0	1		1	3	0	1	7
Malkhana	1	2	1	1		1	0	1	7
Common Toilet	1	1	0	1		2	0	1	6
Anti-poaching/ protection squad	1	0	2			1	2	0	6
Watch Tower		2	2			0	0	0	4
Tube well		1	0		1	0	0	0	2





Activities	Forest Circle wise number of other than Plantation Assets evaluated								
	Bhadrak W/L	Chilika W/L	Chandaka W/L	Bhubaneswar City Circle	Khurda	Puri	Rajnagar W/L	Nayagarh W/L	Total
Waterbody		1	3	2	1	1	2	2	12
Sanctuary		1	0		0	0	0	0	1
Forest Road/ Approach road			1		0	2	2	2	7
WHS			3		0	0	0	0	3
Salt licks			2		0	0	0	0	2
Culvert			1		1	2	1	1	6
Causeway			2		1	0		2	5
Elephant platform			1					0	1
Solar Fencing			1					1	2
Mahunta Shed			1						1
Ticket counter							1		1
VH Tower			1					1	2
Meadow Development			2			2			4
Seizure Yard			1		1	1	1		4
Anti-poaching check gate			1		1				2
LBCD			1						1
GI Fencing							1		1
Cattel immunization							1		1
<b>Total</b>	<b>19</b>	<b>23</b>	<b>34</b>	<b>13</b>	<b>16</b>	<b>31</b>	<b>22</b>	<b>20</b>	<b>178</b>

## 7.2 AR Plantation Activities

Out of 31 plantation sites covered in the study, there are altogether 64 sample plots covering all plantation categories in all forest divisions. There is no plantation site in Bhadrak W/L division for which sample plots of plantation sites are not covered in Bhadrak W/L division. Maximum number of plantation sites are covered in Nayagarh WL followed by Khordha forest divisions.

There are six type of AR plantation activities reportedly taken up under CAMPA intervention during the period 2009-2017 in Bhubaneswar

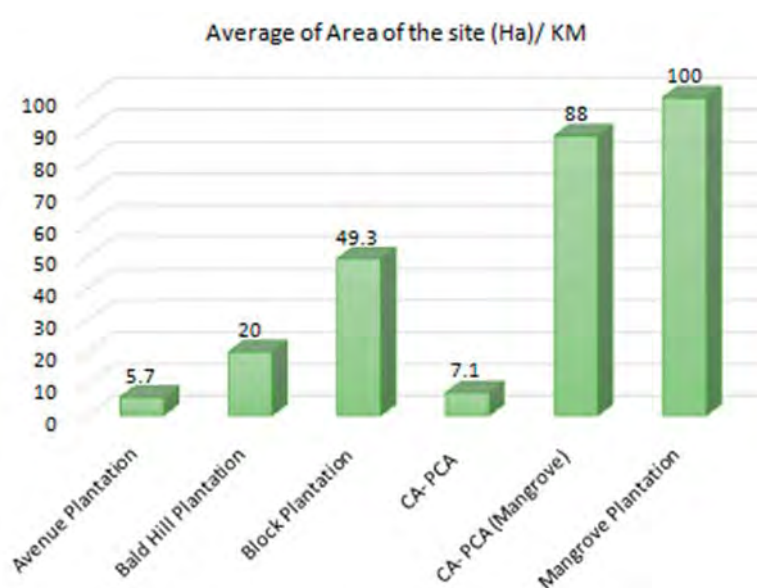


Figure 7.1: Average of Area of the site (Ha) / KM



circles. The average length of avenue plantation is 5.7 kms found in City forest, Khorda and Puri divisions. The average area of Mangrove plantation is 100 hectares which is only found in Rajnagar W/L division. Compensatory Afforestation and Penal Compensatory Afforestation (CA-PCA) exclusively of mangroves is done in Rajnagar W/L division. However, CA-PCA of other plantation activities is taken up in City forest and Khordha forest divisions. Considering all plantation sites in all divisions, excluding avenue plantation, the overall average of plantation site is 48.6 hectares. The average area for block plantation, bald-hills plantation, CA-PCA (Mangrove), CA-PCA (mixed) is found at 49.3, 20.0, 88.0, and 7.1 hectares respectively.

*Table 7.3: Division wise Plantation Activities*

Sl.	Type of Plantation/ Divisions	No. of sites	Average of Area of the site (Ha)/ KM
<b>A</b>	<b>Avenue Plantation</b>	<b>6</b>	<b>5.7</b>
	City Forest	1	9.0
	Khordha	2	2.0
	Puri	3	7.0
<b>B</b>	<b>Bald Hill Plantation</b>	<b>2</b>	<b>20.0</b>
	Khordha	1	20.0
	Nayagarh	1	20.0
<b>C</b>	<b>Block Plantation</b>	<b>14</b>	<b>49.3</b>
	Chandaka	2	50.0
	Chilika WL	1	10.0
	Nayagarh	6	76.7
	Puri	5	24.0
<b>D</b>	<b>CA- PCA</b>	<b>2</b>	<b>7.1</b>
	City Forest	1	2.2
	Khordha	1	12.0
<b>E</b>	<b>CA- PCA (Mangrove)</b>	<b>2</b>	<b>88.0</b>
	Rajnagar WL	2	88.0
<b>F</b>	<b>Mangrove Plantation</b>	<b>1</b>	<b>100.0</b>
	Rajnagar WL	1	100.0
	<b>Overall</b>	<b>27</b>	<b>48.6</b>





On the basis of year of plantation, it is found that out of the overall plantation activities, about 21.9 percent were created in the initial year of CAMPAs i.e. 2009-10. Maximum proportion of plantation sites to the extent of 29.7 percent were created in the year 2014-15 followed by 2015-16. Only 1.6 percent of the assets were created in the year 2011-12. Year wise coverage of plantation activities is shown in the following table.

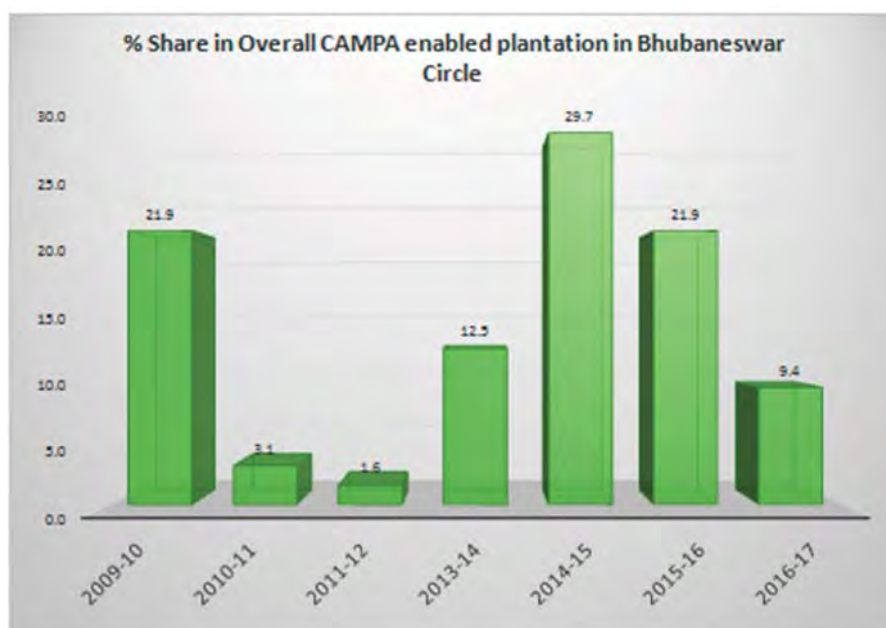


Figure 7.2: % share in Overall CAMPAs enabled plantation in Bhubaneswar Circle

Table 7.4: Year wise Creation of Plantation Activities

Type of Plantation	Year wise creation of Plantations (% of Sites)							
	2009-10	2010-11	2011-12	2013-14	2014-15	2015-16	2016-17	Grand Total
Avenue Plantation		16.7		16.7	50.0	16.7		100.0
Bald Hill Plantation						100.0		100.0
Block Plantation	100.0							100.0
CA- PCA			50.0			50.0		100.0
CA- PCA (Mangrove)				100.0				100.0
Mangrove Plantation		100.0		0.0				100.0
Urban plantation fruit bearing							100.0	100.0
<b>Grand Total</b>	<b>21.9</b>	<b>3.1</b>	<b>1.6</b>	<b>12.5</b>	<b>29.7</b>	<b>21.9</b>	<b>9.4</b>	<b>100.0</b>

### 7.2.1 Survival of Trees

Plantation type wise number of total number of trees planted, number of surviving trees and extent of plant survival is furnished separately for all plantation categories as follows.

**Avenue Plantation:** On the basis of survival performance, the status of divisions undertaking AR plantation is ranked as high, medium and light. If the survival performance is  $\geq 90$  percent it is high,  $>80$  to  $< 90$  percent, it is medium and  $<80$  percent it is low. Following this method, the survival rank of all of the



three divisions stands low. Lower survival of trees under avenue plantation in all of the reporting divisions is attributed to the recent cyclonic storm “Foni” which took place in the month of May 2019.

*Table 7.5: Avenue Plantation*

Divisions	No of trees found / RKM	No of Casualty	TOTAL	% of casualty	Survival (%)	Performance Ranking
City Forest	70	30	100	30.0	70.0	Low
Khordha	150	40	190	21.1	78.9	Low
Puri W/L	150	50	200	25.0	75.0	Low
<b>Total</b>	<b>370</b>	<b>120</b>	<b>490</b>	<b>24.5</b>	<b>75.5</b>	<b>Low</b>

**Bald Hills Plantation:** With respect to bald hills plantations, the overall survival of trees, as shown in the following table stands at 89.4 percent. Compared to the overall percentage of survival, it is found lower in Khordha division and higher in Nayagarh division. Following the survival score scale, the performance of Khordha division, it is medium and for Nayagarh division it is high. Overall performance of bald hills plantation on the basis of survival indicator stand medium.

*Table 7.6: Performance of Bald hills Plantations*

Divisions	No of trees found / RKM	No of Casualty	TOTAL	% of casualty	Survival (%)	Performance Ranking
Khordha	1340	260	1600	16.25	83.75	Medium
Nayagarh	1520	80	1600	5.00	95.00	High
<b>Overall</b>	<b>1430</b>	<b>170</b>	<b>1600</b>	<b>10.6</b>	<b>89.4</b>	<b>Medium</b>

**Block Plantation:** Block Plantation is carried out under four forest divisions and overall casualty is about 22.2 percent. Compared to the overall survival, it is found higher in Chilika W/L and Puri divisions. Following the survival ranking criteria, performance of Chandaka W/L is high, for Chilika W/L and Nayagarh, it is medium and for Puri W/L division it is low. Overall performance is also low. As it is reported during field study, due to the last cyclone “Fani”, the extent of survival of trees in Puri particularly at Balukhand range, one of the sample sites, and Chilika W/L divisions was very much lower.

*Table 7.7: Performance of Block Plantation*

Divisions	No of trees found / RKM	No of Casualty	TOTAL	% of casualty	Survival (%)	Performance Ranking
Chandaka W/L	1560	50	1600	3.1	96.9	High
Chilika WL	1290	310	1600	19.4	80.6	Medium
<b>Nayagarh</b>	<b>1370</b>	<b>230</b>	<b>1600</b>	<b>14.4</b>	<b>85.6</b>	<b>Medium</b>
Puri	840	760	1600	47.5	52.5	Low
<b>Overall</b>	<b>1265</b>	<b>337.5</b>	<b>1600</b>	<b>21.1</b>	<b>78.9</b>	<b>Low</b>

**CA-PCA Plantation:** CA-PCA plantation is carried out under two forest divisions – city forest and Khordha forest divisions. Overall survival is found 96.9 percent and performance of both the divisions on the basis of survival performance is found high.





Table 7 8: Performance of CA-PCA Plantation

Divisions	No of trees found / RKM	No of Casualty	TOTAL	% of casualty	Survival (%)	Performance Ranking
City Forest	1600	0	1600	0.0	100.0	High
Khordha	1550	50	1600	3.1	96.9	High
<b>Total</b>	<b>1580</b>	<b>50</b>	<b>1600</b>	<b>3.1</b>	<b>96.9</b>	<b>High</b>

**CA- PCA (Mangrove):** CA- PCA mangrove plantation is carried out only in Rajnagar W/L division. It is reported by the forest officials that mangrove plantation is done with 1.5 metres spacing and there is no casualty in such plantation. Due to nil casualty of such plantation, the performance of CA- PCA (mangrove) type of plantation is found high.

Table 7.9: Performance of CA- PCA Mangrove Plantation

Row Labels	% of casualty	% of Survival	Ranking
Rajnagar WL	0	100.0	High

Urban plantation fruit bearing: Urban and fruit bearing plantation is undertaken only in one division out of all plantation sites evaluated in Bhubaneswar circle. It is found that there is nil casualty after 1st year replacement. Resultingly, the performance of such plantation stands high.

Table 7.10: Performance of Urban fruit bearing plantation

Divisions	No of trees found / RKM	No of Casualty	TOTAL	% of casualty	Survival (%)	Performance Ranking
Chandaka	1600	0	1600	0	100	High
<b>Total</b>	<b>1600</b>	<b>0</b>	<b>1600</b>	<b>0</b>	<b>100</b>	

## 7.2.2 Tree Diversity

Tree diversity under different plantation categories is summarized in table 195 given ahead. Plantation type wise density of trees is calculated by considering number of trees per 10000 trees. Major tree species considered under CAMPA plantation are outlined. Badachakunda, Phasi and Jamun are three major species under avenue plantation; Akasia, Mangium and phasi are found to be the major species under bald hill plantations, Akasia, Casuarina and Bada Chakunda are the major species under Block Plantation. Teak and mangium species are found to be the major species under CA-PCA plantation.

## 7.2.3 Plantation wise Height and GBH/GCH Performance

Type of plantation wise average maximum height, average minimum height and GBH/GCH for all of the trees is shown in the following table. Considering all plantation categories and all the trees, the average maximum, minimum height is found at 6.66 metres. 3.79 metres respectively. Similarly, the difference between overall maximum and minimum GBH/GCH is found at 31.21 and 14.53 respectively. On the basis of difference of average annual maximum and minimum heights, the height performance of plantations is categorized as High, Medium and Low. Similarly, on the basis of GBH/GCH performance of plantations, GBH/GCH performance of all type of plantations are analysed. Plantation wise details of height and GBH/GCH performance is analysed in Table 7.11.



Table 7.11: Plantation wise Height and GBH/GCH performance of all AR Plantations

Sl.	Type of Plantation	Type of trees	Average max Height (in Metre)	Average Min Height (in Metre)	Average MAX HEIGHT PER YEAR	Average MIN HEIGHT PER YEAR	Average Max GBH/ GCH in cm	Average Min GBH/ GCH in cm	Average MAX GBH/ GCH PER YEAR	Average MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ year & Ave Minimum GHH/ Year	Height Performance (High > or =0.5, Medium <0.5 or =1, Low >1, )	GBH/ GCH Performance (High > or =3.0, Medium <3.0 or =5, Low >5, )
A	Avenue Plantation	Ailanthus excelsa	6	4	1	0	75		12.5	0	1	12.5		
		Badachakunda	5.5	4	1	0.73	31.15	16	5.64	1.6	0.27	4.04		
		Jamun	4	3	0.8	0.6	22	12	4.4	2.4	0.2	2		
		Karanja	6	3	1	0.5	32.7	21.3	5.45	3.55	0.5	1.9		
		Kathabadam	6	4.25	0.6	0.43	18.4	10.1	1.84	1.01	0.17	0.83		
		Kegelia pinnata	4.5	3	0.64	0.43	32.9	21.7	4.7	3.1	0.21	1.6		
		Mahaneem	2	1	0.2	0.1	25		2.5	0	0.1	2.5		
		Neem	5	3.5	0.83	0.58	56.65	23.1	9.44	3.85	0.25	5.59		
		Panasa	4	2	0.8	0.4	28	20	5.6	4	0.4	1.6		
		Patali	5	3	0.83	0.5	38.3	21.3	6.38	3.55	0.33	2.83		
		Phasi	6	4.5	0.86	0.64	62.6	48.2	8.94	6.89	0.22	2.05		
		Total	5.04	3.31	0.79	0.48	37.78	20.63	6.02	2.6	0.31	3.42	High	Medium
B	Bald Hill Plantation	Acacia auriculiformis	10	7	2	1.4	30	18	6	3.6	0.6	2.4		
		Badachakunda	4	2	0.8	0.4	22.3	18.5	4.46	3.7	0.4	0.76		
		Gambhari	8	6	1.6	1.2	32	20	6.4	4	0.4	2.4		
		Mangium	4	2	0.8	0.4	17.9	9.2	3.58	1.84	0.4	1.74		
		Neem	4	2	0.8	0.4	21.9	10.5	4.38	2.1	0.4	2.28		
		Simili	12	10	2.4	2	35	25	7	5	0.4	2		
		Teak	12	8	2.4	1.6	28	13	5.6	2.6	0.8	3		
		Total	7.71	5.29	1.54	1.06	26.73	16.31	5.35	3.26	0.48	2.09	High	High
C	Block Plantation	Acacia auriculiformis	9.33	5.17	0.85	0.47	39.5	16.17	3.59	1.47	0.38	2.12		





Sl.	Type of Plantation	Type of trees	Average max Height (in Metre)	Average Min Height (in Metre)	Average MAX HEIGHT PER YEAR	Average MIN HEIGHT PER YEAR	Average Max GBH/ GCH in cm	Average Min GBH/ GCH in cm	Average MAX GBH/ GCH PER YEAR	Average MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ year & Ave Minimum GHH/ Year	Height Performance (High > or =0.5, Medium <0.5 or =1, Low >1, )	GBH/ GCH Performance (High > or =3.0, Medium <3.0 or =5, Low >5, )
		Badachakunda	11.4	7.4	1.04	0.67	42.8	14.8	3.89	1.35	0.37	2.54		
		Cashew	1		0.09	0			0	0	0.09	0		
		Casuarina	8	3.67	0.44	0.2	40	18.67	2.18	1.02	0.24	1.16		
		Chatian	7	5.5	0.64	0.5	28.25	20.55	2.57	1.87	0.14	0.7		
		Salia Bamboo	20	10	1.82	0.91			0	0	0.91	0		
		Simaruba	7.25	3.25	0.66	0.3	50	15.75	4.55	1.43	0.36	3.12		
		Sirisa	8	4.25	0.73	0.39	49	18	4.45	1.64	0.34	2.81		
		Sisoo	11.75	6	1.07	0.55	27.75	9.25	2.52	0.84	0.52	1.68		
		Teak	10.57	4.57	0.96	0.42	32.6	12.6	2.12	0.82	0.54	1.3		
		Total	9.84	5.3	0.85	0.45	39.32	15.25	2.95	1.14	0.4	1.81	High	High
D	CA- PCA	Karanja	5	3	0.56	0.33	30	12	3.33	1.33	0.23	2		
		Mangium	4	2	0.8	0.4	23.8	11.8	4.76	2.36	0.4	2.4		
		Sirisa	8	5	0.89	0.56	78	28	8.67	3.11	0.33	5.56		
		Sisoo	8	5	0.89	0.56	65	21	7.22	2.33	0.33	4.89		
		Teak	6.5	3	0.9	0.38	41.7	12	5.58	0.67	0.52	4.91		
		Total	6.33	3.5	0.82	0.43	46.7	16.96	5.86	1.75	0.39	4.11	High	Medium
E	CA- PCA (Mangrove)	Bondari	3.5	2	0.5	0.29	13	8.5	0.93	0.61	0.21	0.32		
		Buni	7.75	5.25	1.11	0.75	30.3	16.2	2.16	1.16	0.36	1		



Sl.	Type of Plantation	Type of trees	Average max Height (in Metre)	Average Min Height (in Metre)	Average MAX HEIGHT PER YEAR	Average MIN HEIGHT PER YEAR	Average Max GBH/ GCH in cm	Average Min GBH/ GCH in cm	Average MAX GBH/ GCH PER YEAR	Average MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ year & Ave Minimum GBH/ Year	Height Performance (High > or =0.5, Medium <0.5 or =1, Low >1, )	GBH/ GCH Performance (High > or =3.0, Medium <3.0 or =5, Low >5, )
		Dot	3	2	0.43	0.29			0	0	0.14	0		
		Garani	3	2.5	1.5	0.36			0	0	1.14	0		
		Guan	5	3.5	0.71	0.5	16.2	10.2	1.16	0.73	0.21	0.43		
		Kalichua	6	4.5	0.86	0.64			0	0	0.22	0		
		Keruan	8.75	5.5	1.25	0.79	42.9	16.6	3.06	1.19	0.46	1.87		
		Rai	6.75	4	0.96	0.57	28.2	16.1	2.01	1.15	0.39	0.86		
		Sindhika	6.75	4.05	0.96	0.58	28.4	16.7	2.03	1.19	0.38	0.84		
		Total	6.14	3.84	0.82	0.55	26.5	14.05	1.51	0.8	0.27	0.71	High	High
F	Mangrove Plantation	Buni	2.5	1.5	0.25	0.15			0	0	0.1	NA		
		Garani	1.5	1	0.15	0.1			0	0	0.05	NA		
		Rai	4.5	3	0.45	0.3			0	0	0.15	NA		
		Sindhika	3	2	0.3	0.2			0	0	0.1	NA		
		Total	2.88	1.88	0.29	0.19			0	0	0.1	NA	High	NA
G	Urban plantation fruit bearing	Banyan	1.5		0.38	0	14.5		3.63	0	0.38	3.63		
		Neem	1.5	1	0.38	0.25	12.3		3.08	0	0.13	3.08		
		Salia Bamboo	3	1	0.75	0.25			0	0	0.5	0		
		Teak	1		0.25	0			0	0	0.25	0		
		Total	1.75	1	0.44	0.13	13.4		1.68	0	0.31	1.68	High	Medium
		Grand Total	6.66	3.79	0.83	0.47	31.21	14.53	3.32	1.46	0.36	1.86	High	High





### 7.2.4 Canopy Density

As it is depicted from the following table, the average canopy density across plantations and forest divisions vary in the range between 0 to 100 percent. Due to last cyclone “Fani” in Odisha, the canopy density of avenue plantations of city forest and Khordha divisions has almost reached to nil level. The plantation performance on the basis of Canopy density is marked as high, medium and low. If the average canopy is  $\geq 70$  percent, it is levelled as high; if the value is  $\geq 50$  and  $\geq 70$  percent it is medium and  $< 50$  percent it is low. The overall canopy performance of avenue plantation, Block Plantation and urban plantation is found low. For other categories of AR plantation, it is found High.

Table 7.12: Canopy density of AR Plantations

Sl.	Type of Plantation	Divisions	Average of Canopy %	Canopy Performance (High, $\geq 70$ percent, Medium $< 70$ or $\geq 50$ percent, Low $< 50$ percent)
A	Bald Hill Plantation	Khordha	80	High
		Nayagarh	80	High
		Total	80	High
B	Block Plantation	Chandaka	90	High
		Chilika WL	40	Low
		Nayagarh	21	Low
		Puri	38	Low
		Total	38	Low
C	CA- PCA	City Forest	90	High
		Khordha	80	High
		Total	85	High
D	CA- PCA (Mangrove)	Rajnagar WL	100	High
E	Mangrove Plantation	Rajnagar WL	100	High
F	Urban plantation	Chandaka	0	Low
		<b>Grand Total</b>	<b>48</b>	<b>Low</b>

### 7.2.5 SMC Works

Out of the total AR plantation sites as mentioned in the following table, no SMC works were observed for the sample of avenue plantations, Block plantations, SSO timber and urban plantations, The SMC performance of all such plantations is found low. On the other hand, on the basis of performance ranking scale which is expressed in terms of average siltation percentage, the overall performance of SMC activity considering all plantation types and all forest divisions is found high. Performance of SMC works in mangrove plantation is kept 100 percent because the basic objective behind such plantation is soil conservation in nature all though SMC works are not explicitly undertaken.



Table 7.13: No of SMC works for plantation Activities

Sl.	Type of Plantation	Divisions	Percentage of Plantation sites adopting SMC works		Average Extent of siltation (%)	Performance of SMC works ( If siltation percentage is > or =50, High, <50 and > or= 30, Medium, <30 , Low)
			Single type of SMC works	Multiple Type of SMC works		
<b>A</b>	<b>Avenue Plantation</b>	City Forest				
		Khordha				
		Puri				
		Total				Low
<b>B</b>	<b>Bald Hill Plantation</b>	Khordha	0.0	100.0	40	Medium
		Nayagarh	0.0	100.0	40	Medium
		Total	0.0	100.0	40	Medium
<b>C</b>	<b>Block Plantation</b>	Chandaka				
		Chilika WL				
		Nayagarh				
		Puri				
		Total			NA	Low
<b>D</b>	<b>CA- PCA</b>	City Forest				
		Khordha	100.0	0.0	20	Low
		Total	100.0	0.0	20	Low
<b>E</b>	<b>CA- PCA (Mangrove)</b>	Rajnagar WL			100	High
		Rajnagar WL			100	High
		Khordha	0.0	100.0	60	High
		Nayagarh	90.5	9.5	63	High
		Total	91.9	8.1	62	High
<b>F</b>	<b>SSO Timber</b>	Khordha			0	Low
<b>G</b>	<b>Urban plantation</b>	Chandaka			0	Low
		<b>Grand Total</b>	<b>88.5</b>	<b>11.5</b>	<b>52</b>	<b>High</b>





## 7.2.6 Protection Measures

Table 7.14 : Plantation Category wise Protection Measures

Type of Plantation	Reported Protection Measures followed
Avenue Plantation	No protection Measure
Bald Hill Plantation	Fencing
	Green Fencing (Bamboo and Murgas) and also general watch and ward
Block Plantation	4 years watch & ward
	Anti-poaching gate and fencing
	EDC is there
	EDC, squad & Gate are there
	General watch and ward
	Inside sanctuary 2.5m spacing
	Watch & ward for 3 years. Fire line created.
CA- PCA	General
	Para staff protection
CA- PCA (Mangrove)	Barbed wire fencing was done for plantation protection.
	Barbed fencing was done.
Mangrove Plantation	Watch & Ward
Urban plantation	Anti-poaching gate and fencing

## 7.3 ANR with Gap Plantation Activities

ANR with gap plantation is found in three forest divisions Chilika W/L, Khordha and Nayagarh forest divisions. The sample Plantation sites were created during the period 2014-15 to 2016-17.

Table 7.15: Coverage of ANR with Gap Plantation

Divisions	Year of Creation	Average Area of the site
Chilika WL	2016-17	200
Khordha	2015-16	82
Nayagarh	2014-16	106
<b>Total (Average of all divisions)</b>		<b>122</b>

### 7.3.1 Survival and Causality

The survival and causality of trees under ANR with gap plantation is as per following table. Overall tree survival and causality is found at 86.9 and 13.1 percent respectively. Compared to overall survival of trees under ANR with gap plantation, it is found higher in Nayagarh and Chilika divisions and lower in Khordha divisions. The performance of survival and casualty is assessed on the basis of a scale of casualty percentage as given in the following table 7.16. As per following table, the overall performance of CAMPA enabled ANR with gap plantation is medium. For Chilika and Nayagarh divisions it is high compared to medium performance at Khordha division.

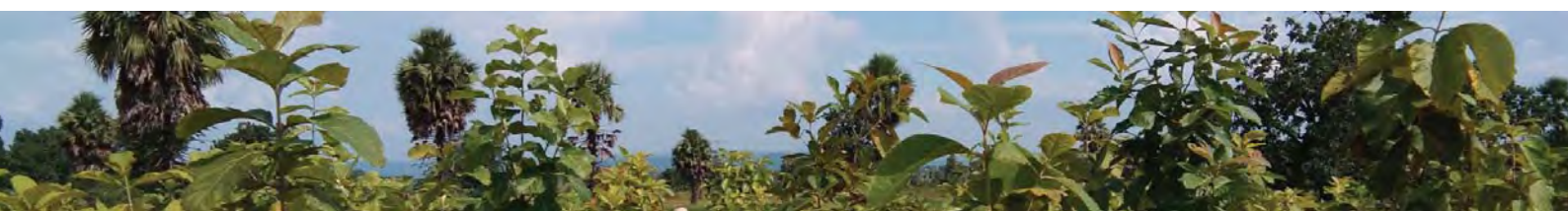


Table 7.16: Performance of ANR with gap Plantation

Row Labels	Average of Calculated Trees Per Plot	Average Casualty	TOTAL	No of trees survived for 200 trees	% of survival	Ranking High>or=90, Medium <90 or >80, Low <80	Type of tree species regenerated
Chilika WL	136	8	144	189	94.4	High	Sal, Kendu, Mahula, Asana, Amla
Khordha	142	18	160	178	88.8	Medium	
Nayagarh	147	13	160	184	91.9	High	
Overall	139	13	160	174	86.9	Medium	

### 7.3.4 Tree Diversity in ANR with Gap Plantation

Analysing the type of trees available at ANR with gap plantation sites, it is known that *Acacia auriculiformis*, *Casuarina* and *Casia siamiae* are the major species out of 10 varieties of species found in all of the plantation sites covered in the study. The intensity of *Acacia auriculiformis*, *Casuarina* and *Casia siamiae* is found at 4982, 2592 and 1109 per 10000 plants.

### 7.3.5 Height and GBH/GCH Performance

In order to find out the height and GBH/GCH performance of all the reported trees, two scales are used separately. For examining the height performance, the difference between average maximum height per year and average minimum height per year is considered. Similarly, for examining the GBH/GCH performance the difference between average maximum GBH/GCH per year with average minimum GBH/GCH per year is considered. The logic is that due to treatment effects, it is expected that the differences are to be less. Ranking of individual trees on the basis of difference criteria is as shown in the following table 7.17. The height performance of all of the trees are found good. On the other hand, the GBH/GCH performance for Chatiyan trees is low and for magnum trees it is found medium. For remaining trees, the GBH/GCH performance is found good. The overall performance of ANR with gap plantation in terms of height and GBH/GCH performance is found good.





Table 7.17: Average max height by height rank (ANR with Gap Plantation)

Sl. No	Row Labels	Average of Max Height in Metre	Average of Min Height in Metre	Average of MAX HEIGHT PER YEAR	Average of MIN HEIGHT PER YEAR	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average of MAX GBH/ GCH PER YEAR	Average of MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ GCH/ year & Ave Minimum GH/ Year	Height Performance (High > or =0.5, Medium <0.5 or =1, Low >1, )	GBH/GCH Performance (High > or =3.0 , Medium <3.0 or =5, Low >5, )
1	Badachakunda	5	2	1	0.4	24.1	12.2	4.82	2.44	0.6	2.38	High	High
2	Casia siamia	3	1.5	0.6	0.3	16.1	9.58	3.22	1.92	0.3	1.3	High	High
3	Chatiyani	3	1	0.6	0.2	27.2		5.44	0	0.4	5.44	High	Low
4	Mangium	3	1	0.6	0.2	15.3		3.06	0	0.4	3.06	High	Medium
5	Neem	4	2	0.8	0.4	16.9	9.7	3.38	1.94	0.4	1.44	High	High
6	Simaruba	3	2	0.6	0.4	26.2	13.2	5.24	2.64	0.2	2.6	High	High
7	Teak	4.25	1.5	0.85	0.3	21.88	9.18	4.38	1.84	0.55	2.54	High	High
8	Acacia auriculiformis	5.8	3.1	1.16	0.63	21.9	11.9	3.84	2.07	0.53	1.77	High	High
9	Casuarina	4.5	2.75	1.13	0.69	5.25	2.75	1.31	0.69	0.44	0.62	High	High
10	Teak	5.5	2.5	0.92	0.42	27.25	17.25	4.54	2.88	0.5	1.66	High	High
	<b>Total</b>	<b>4.105</b>	<b>1.935</b>	<b>0.826</b>	<b>0.394</b>	<b>20.208</b>	<b>10.72</b>	<b>3.923</b>	<b>1.642</b>	<b>0.432</b>	<b>2.281</b>	<b>High</b>	<b>High</b>

### 7.3.6 Canopy Density

The overall canopy percent for ANR with gap plantations is found at 35 percent. On the basis of performance ranking scale, the overall canopy performance is found low. Canopy performance is observed high in Khordha division and low in Chilika and Nayagarh divisions.

*Table 7.18: Canopy Performance of ANR with Gap Plantation*

Sl.	Divisions	Average of Canopy %	Canopy Performance (High, > or= 70 percent, Medium <70 or > and =50 percent, Low <50 percent)
1	Chilika WL	40	Low
2	Khordha	76	High
3	Nayagarh	10	Low
	Overall	35	Low

### 7.3.7 SMC Works

With respect to ANR with gap plantation, in all forest divisions, staggered trenches are found and there is no other type of SMC works observed during the time of survey. No SMC work is found in Chilika division. Consequently, SMC performance of this division is fixed low. For Khordha division it is high and for the remaining two divisions, it is found medium.

*Table 7.19: No of SMC works for plantation Activities*

Sl.	Type of Plantation	Divisions	Percentage of Plantation sites adopting SMC works		Average Extent of siltation (%)	Performance of SMC works (If siltation percentage is > or =50, High, <50 and > or= 30, Medium, <30, Low)
			Single type of SMC works	Multiple Type of SMC works		
1	ANR with Gap	Chilika WL			NA	Low
2		Khordha	100.0	0.0	52	High
3		Nayagarh	100.0	0.0	30	Medium
		<b>Total</b>	<b>100.0</b>	<b>0.0</b>	<b>48</b>	<b>Medium</b>

### 7.3.8 Protection Measures

*Table 7.20: Protection Measures for ANR with Gap Plantation*

Protection Measures
General watch and ward
Watch & Ward
Watch and ward for 3 years and also handed over to Nandala VSS for protection. Fireline created to protect against fire.
Wired fence, Watch & Ward
General watch and ward





## 7.4 Conservation, Regeneration and Management (CRM)

CRM activity broadly covers SSO works, ANR without gap and conservation of old plantations and forest patches. SSO bamboo and SSO timber are the prominent CRM activities found in Bhubaneswar circle. The average area under SSO bamboo and SSO timber is found at 308.3 and 508.0 hectares respectively. With the objective of analysing the performance of SSO bamboo and SSO timber, 15 SSO bamboo plots and 5 SSO timber plots were covered in the study. Average area under SSO operation for both the categories is shown in the following table 7.21.

*Table 7.21: No. of sites taken up for CRM Activities*

Sl.	SSO Activity	SSO Activity/ Division	% of Sites	Average Plantation Area (Hectares)	Subsidiary Silvicultural Operations
A	SSO Bamboo	Khordha	33.3	200.0	Stone packing on the lower side of clump and earth filling around the clump Half moon trench on the upper side
		Nayagarh	66.6	362.5	
		Total	100.0	308.3	
B	SSO Timber	Khordha	50.0	584.0	cleaning, pruning, high stump cutting, climber cutting SMC Works including staggered trenches and half-moon trench
		Total	50.0	584.0	
	Overall			100.000	

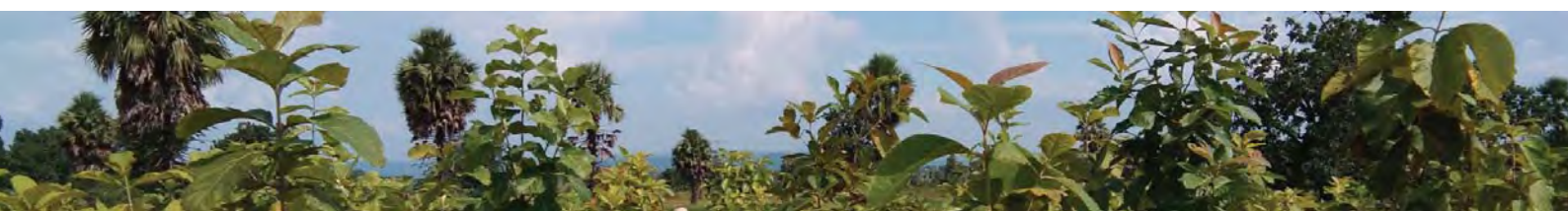
### 8.4.1 Impact of SSO

Analysing the performance of SSO Bamboo activities on the basis of sample data of two sites in Khordha and Nayagarh, it is found that overall there are 125 clumps per hectare of forest area of which around 15.05 were damaged during the time of survey. On an average the number of first year, second year and third year culms are found at 560, 960 and 1265 respectively. As it is revealed in Table 7.22, the performance of SSO bamboo plantation of all forest divisions is found to below.

*Table 7.22: Performance of SSO Bamboo (Hectares)*

Sl.	Divisions	No of Clumps	Average of No of clumps damaged	Average of 1st year culms	Average of 2nd year culm	Average of more than 2 years	Damaged Clumps as % to total clumps	Performance of SSO bamboo (High if clumps damage is < or = 10 percent, Medium, >10 and < or=20 percent, Low >20 percent)
1	Khordha	80	10	400	560	960	12.5	Medium
2	Nayagarh	170	30	720	1360	1570	17.6	Medium
	Overall	125	20	560	960	1265	15.05	Medium

The sample timber site is located at Bhetabara beat under Ranpur range of Khurda division which is a very dense forest. It was observed that due to SSO activities, like cleaning, pruning, high stump cutting, and climber cutting etc, there is better growth of trees. Apart from normal SSO activities, SMC works consisting



of half-moon trenches and staggered trenches were also done at the plantation site. The natural species largely regenerated at the site include Amla, Mahua and Karanja, Suama, Asana, Sala, Kendu, Dhakati, etc.

### 7.4.2 Protection Measures

In addition to general watch and word, bamboo stick fencing is also undertaken. Para staff are appointed for protecting SSO bamboo forest and for protecting timber forest, foot patrolling is also undertaken by the forest officials.

*Table 7.23: Protection Measures for Plantation sites under SSO Activities*

Type of SSO Activity	Protection Measures
SSO Bamboo	General watch and ward
	General watch and ward & Bamboo stick fencing
	Squad
SSO Timber	Foot Patrolling

## 7.5 Type of Intervention at Plantation Sites

CAMPA aided intervention formalities in all plantation sites include geo tagged pillars around plantation sites, installation of sign boards describing the details of plantation site, year of creation, intervention area (hectares), etc. The outcome performance of all such activities are measured in terms of good, medium and low. If it is maintained in 100 percent of the sites, the performance is viewed good, otherwise low and medium. The performance of all such activities is separately shown in table 7.24

*Table 7.24: Plantation site specific formalities under CAMPA*

Type of Plantation	pillars at plantation sites	Sign Board at plantation site	Delineated Hectares plot	Plant-ation Journal	Plantation journals fully maintained	Plant-ation Maps	Micro Plan	Treat-ment Map	Mainte-nance of register
ANR with Gap	100.0	85.5	0	100	100	100	0	54.5	0.0
Avenue Plantation		83.3	0	100	100	100	0	0.0	0.0
Bald Hill Plantation	100.0	0.0	0	100	100	100	0	0.0	0.0
Block Plantation	100.0	42.9	0	100	100	100	0	0.0	0.0
CA- PCA	100.0	50.0	0	100	100	100	0	0.0	0.0
CA- PCA (Mangrove)	100.0	0.0	0	100	50	50	0	0.0	0.0
Mangrove Plantation	100.0	100.0	0	100	0	100	0	0.0	0.0
SSO Bamboo		100.0	0	0	0	60	0	0.0	66.7
SSO Timber		0.0	0	0	0	0	0	0.0	0.0





Type of Plantation	pillars at plantation sites	Sign Board at plantation site	Delineated Hectares plot	Plant-ation Journal	Plantation journals fully maintained	Plant-ation Maps	Micro Plan	Treat-ment Map	Mainte-nance of register
Urban plantation fruit bearing	100.0	100.0	0	100	100	100	0	0.0	0.0
Grand Total	100.0	56.3	0	68.75	65.625	81.25	0	17.2	15.6
Performance Ranking (Good, > 70 to = 100 percent, Medium >40 to < or=70 percent, Low <40 percent)	High	Medium	Low	Medium	Medium	High	Low	Low	Low

## 7.6 Overall SMC Measures

Mainly staggered trenches, half-moon trenches and stone packing around trees are mainly found at plantation sites. Staggered trenches are found at 26.6 percent of the plantation sites and half-moon trenches with stone packing are found only in SSO bamboo sites.

Table 7.25: Overall SMC Measures undertaken at Plantation Sites

Type of Plantation Activity	Percentage of Plantation sites		
	Staggered Trench	Half-moon trench	Stone Packing
ANR with Gap	60.0	0.0	0.0
Avenue Plantation	0.0	0.0	0.0
Bald Hill Plantation	100.0	0.0	0.0
Block Plantation	0.0	0.0	0.0
CA- PCA	50.0	0.0	0.0
CA- PCA (Mangrove)	0.0	0.0	0.0
Mangrove Plantation	0.0	0.0	0.0
SSO Bamboo	33.3	33.3	33.3
SSO Timber	0.0	0.0	0.0
Urban plantation	0.0	0.0	0.0
<b>Grand Total</b>	<b>26.6</b>	<b>7.8</b>	<b>7.8</b>



## 7.7 Site specific observations and Impacts of CAMPA aided Plantation Activities

Table 7.26: Plantation specific observations and Impacts

Sl.	Division/ Range/ Section/ Beat/ Type of Plantation	Observations	Impact of the Plantation
1	Khordha/ Khordha/ Gada Khordha/ Avenue Plantation	<ul style="list-style-type: none"> <li>Maximum number of trees are neem.</li> <li>Tree to tree spacing is measured four metres.</li> </ul>	<ul style="list-style-type: none"> <li>Space is left for sheep/ goats' movement.</li> <li>Due to better grazing facility for local goats and sheep, meat production in the neighbourhood area is likely to increase.</li> </ul>
2	Khordha/ Tangi/ Tangi Tangi/ ANR with Gap	<ul style="list-style-type: none"> <li>The terrain of plantation site is observed a plain land.</li> <li>Casualty replacement is taken care of.</li> </ul>	<ul style="list-style-type: none"> <li>Tree growth is good.</li> <li>Much of the trees on side is found damaged by the last cyclone 'Fani'.</li> </ul>
3	Khordha/ Ranpur/ Sankhajodi/ Sirikuti SSO Bamboo	<ul style="list-style-type: none"> <li>Very dense bamboo forest.</li> <li>Flowering was completed.</li> </ul>	<ul style="list-style-type: none"> <li>After SSO, new bamboos were found to have been regenerated in the existing clumps.</li> </ul>
4	Khordha/ Khordha Bologarh/ Patabandha/ ANR with Gap	<ul style="list-style-type: none"> <li>Natural regeneration is very high</li> </ul>	
5	Khordha/ Ranpur/ Korodapala/ Bhetabara SSO Timber	<ul style="list-style-type: none"> <li>The dense forest site is found with greenery as a result of SSO works.</li> </ul>	<ul style="list-style-type: none"> <li>Natural regeneration is very high. The regenerated species include Amla, Mahua, Karanja.</li> </ul>
6	Khordha/Tangi Bhusandapur/ Nalsingh/ Bald Hill Plantation	<ul style="list-style-type: none"> <li>Only Departmental protection.</li> <li>Community involvement is found nil.</li> </ul>	<ul style="list-style-type: none"> <li>The Site was damaged by cyclone 'Foni' in 2019.</li> </ul>
7	Khordha/ Tangi/ Tangi Tangi/ CA- PCA	<ul style="list-style-type: none"> <li>Growth is very good</li> <li>The plantation was watered during summer.</li> </ul>	
8	Chandaka/ Bhubaneswar/ Bharatpur/ Bharatpur Block Plantation	<ul style="list-style-type: none"> <li>Plantation is done inside Bharatpur RF, Chandaka sanctuary.</li> <li>Due to protection of the block plantation, natural regeneration is found higher.</li> </ul>	
9	Chandaka/ Bhubaneswar/ Bharatpur/ Bharatpur Urban plantation fruit bearing	<ul style="list-style-type: none"> <li>Murum type soil texture</li> <li>Growth is very low</li> <li>Watering is done through pipe from artificial tank</li> <li>Maximum trees are of very low height</li> <li>Trees are damaged by deer.</li> </ul>	





Sl.	Division/ Range/ Section/ Beat/ Type of Plantation	Observations	Impact of the Plantation
10	City Forest/ Cuttack Salipur/ Chitrotola CA- PCA	<ul style="list-style-type: none"> <li>The plantation site is located on a plain land</li> <li>Natural regeneration of trees is observed.</li> </ul>	<ul style="list-style-type: none"> <li>The plain land has grown into a dense forest with 100% canopy.</li> <li>People's cooperation and motivation for protection of the plantation site improved.</li> </ul>
11	City Forest/ Mancheswar/ Rasulgarh/ Rasulgarh Avenue Plantation	<ul style="list-style-type: none"> <li>Plantation is done in 2 to 3 lines on NH.</li> <li>Tree felling by local residents is noticed.</li> <li>Tree guards are still found around the planted trees.</li> </ul>	<ul style="list-style-type: none"> <li>The plantation was done phase wise. Coupled with tree feeling and phased plantation very less number of trees were survived at the time of inspection by the study team.</li> </ul>
12	Chilika WL/ Rambha Pitisial/ Nandala ANR with Gap	<ul style="list-style-type: none"> <li>Mostly jhaun species is planted in the plantation site followed by acacia.</li> <li>No SMC work on the plantation site is done.</li> <li>Weed removal activities has been carried out.</li> <li>Due to saline habitat Jhaun (Tamarix dioica) , there is enormous growth of such trees.</li> <li>Last cyclonic storm "Phyline", more casualties of trees on the site reported.</li> <li>The site is water logging in nature.</li> </ul>	<ul style="list-style-type: none"> <li>Green cover has been increased and due to protection number of wild life increased.</li> <li>The species like Acacia, Achu, Neem, Bora have also grown naturally.</li> </ul>
13	Chilika WL/ Tangi/ Saran/ Sunakhala/ Block Plantation	<ul style="list-style-type: none"> <li>Plantation has done on the hilly terrain.</li> <li>Teak, Acacia and chakunda are the major species planted on the site. Due to stoney and morrum soil the survival rate is very low.</li> <li>Initially plantation was done under social forestry and during 2005 to 2008 most of the trees were cut down.</li> <li>In 2009-10 the site was covered under CAMPA plantation.</li> <li>Due to open grazing and high moisture content of the soil on the plantation site, the growth of teak trees is not upto the desired extent.</li> </ul>	<ul style="list-style-type: none"> <li>Due to the plantation activity there is better green cover.</li> <li>Wild animals previously not found in the area, due to better plantation, in-migration of wild animals particularly wild boars and wild cats is reported.</li> <li>Due to protection natural species like Kalachua, Dhaura, Dhamana, Sunari, Goruhada, Keruaha, Khirkholi, Bhadakoli were found regenerated.</li> </ul>



14	Puri/ Gop/ Nimapada Haripur/ Avenue Plantation	<ul style="list-style-type: none"> <li>Plantation is done in two patches which is 6.6 km and 5.4 km respectively</li> <li>Much of the trees were lost to cyclone 'Fani' in 2019.</li> <li>Trees were also bent due to 'Fani' which was straightened by department</li> </ul>	<ul style="list-style-type: none"> <li>Crown density is less</li> </ul>
15	Puri/ Konark/ Konark Chandrabhaga/ Block Plantation	<ul style="list-style-type: none"> <li>Plantation is done inside sanctuary for dual purpose (block &amp; fodder).</li> <li>Slightly damaged by Fani</li> <li>Growth is satisfactory</li> <li>EDC is present</li> </ul>	<ul style="list-style-type: none"> <li>Green folder available for live stock population fringe villages.</li> </ul>
16	Puri/ Balukhand/ Satyabadi/ Satyabadi Avenue Plantation	<ul style="list-style-type: none"> <li>Growth of trees is found good, although partially damaged in Fani.</li> <li>Plantation is done at different patches.</li> </ul>	
17	Puri/ Balukhand Balighai/ Bangar Block Plantation	<ul style="list-style-type: none"> <li>Heavily damaged by Fani.</li> <li>The site is water logged.</li> <li>Casualties' of trees through uprooting by wind pressure is reported high.</li> </ul>	<ul style="list-style-type: none"> <li>Species like Accacia &amp; Neem regenerated</li> </ul>
18	Puri/ Gop/ Gop Gop/ Avenue Plantation	<ul style="list-style-type: none"> <li>Spacing of 5m. between trees is adopted</li> <li>Growth of trees are very good.</li> <li>Some trees were damaged in Fani.</li> </ul>	
19	Puri/ Konark/ Ramchandi/ Kapileswar/ Block Plantation	<ul style="list-style-type: none"> <li>Growth is satisfactory with minimum casualties.</li> </ul>	<ul style="list-style-type: none"> <li>There is natural regeneration of cashew plants on the plantation site due to absence of biotic interference.</li> </ul>
20	Puri/ Konark/ Konark Konark/ Block Plantation	<ul style="list-style-type: none"> <li>The plantation site is damaged by Fani and crown density of good portion of planted trees is reduced.</li> <li>2.5m spacing between is adopted.</li> </ul>	
21	Nayagarh/ Mahipur/ Mahipur/ Banuasahi ANR with Gap	<ul style="list-style-type: none"> <li>This plantation site situated near a water body.</li> <li>Staggered trench created on plantation sites were full of water during inspection.</li> </ul>	<ul style="list-style-type: none"> <li>Increase in forest cover. The degraded forest land, changed into a green forest.</li> </ul>
22	Nayagarh/ Mahipur Mahitoma/ Kosalanga Block Plantation	<ul style="list-style-type: none"> <li>Moram type of soil is found on the plantation site.</li> </ul>	<ul style="list-style-type: none"> <li>Increase in forest coverage.</li> <li>Varieties of species are regenerated on the plantation site.</li> </ul>
23	Nayagarh/ Odagaon Bahadajholla/ Bahadajholla/ Block Plantation	<ul style="list-style-type: none"> <li>This plantation side is situated in the boundary line of the DPF.</li> </ul>	<ul style="list-style-type: none"> <li>Degraded forest change to green forest.</li> </ul>





24	Nayagarh/ Odagaon Bahadajholla/ Bahadajholla/ ANR with Gap	<ul style="list-style-type: none"> <li>Compared to other tree species, the survival percentage of Akasia is found higher.</li> <li>LBCDs created on the plantation site plays an important role for soil conservation and moisture conservation.</li> <li>Given plantation norm of 200 trees per hectare, plantation was undertaken in a large vacant area under block plantation mode.</li> </ul>	<ul style="list-style-type: none"> <li>Natural species i.e. Suama, Asana, Sala, Kendu, Dhakati found naturally regenerated as a result of ANR with gap plantations activities.</li> </ul>
25	Nayagarh/ Odagaon/ Odagaon/ Odagaon SSO Bamboo	<ul style="list-style-type: none"> <li>Alongside of SSO bamboo plantation, a mixed bamboo forest is also observed.</li> <li>The site is Sloppy and full of boulders. High grade Salia bamboos with better growth is noticed.</li> </ul>	<ul style="list-style-type: none"> <li>Increase of Bamboo forest</li> </ul>
26	Nayagarh/ Khandapada/ Bhapur Marada/ Bald Hill Plantation	<ul style="list-style-type: none"> <li>Species survival rate is good.</li> <li>Better growth of trees is observed.</li> </ul>	<ul style="list-style-type: none"> <li>There is greenery on the bald hill due to this plantation.</li> </ul>
27	Nayagarh/ Khandapada/ Singapada/ Nuapalli SSO Bamboo	<ul style="list-style-type: none"> <li>This is a mixed bamboo forest.</li> <li>Site situated on a plane area inside the dense forest.</li> <li>There are high grade Salia bamboos with better growth.</li> </ul>	<ul style="list-style-type: none"> <li>After SSO, the Bamboo clumps regenerated more culms.</li> </ul>
28	Rajnagar WL/ Mahakalpada/ Batighara/ Kansaridiha/ CA- PCA (Mangrove)	<ul style="list-style-type: none"> <li>Due to very dense mangrove forest, the site is not easily accessible.</li> <li>There 1.5 metre spacing between the trees.</li> </ul>	<ul style="list-style-type: none"> <li>Before CAMPA intervention the plantation site was encroached for Prawn farming. After CAMPA intervention the area has been converted to mangrove forest that abled to control soil erosion.</li> </ul>
29	Rajnagar WL/ Mahakalpada/ Batighara/ Kansaridiha/ CA- PCA (Mangrove)	<ul style="list-style-type: none"> <li>Due to very dense mangrove forest, the site is not easily accessible.</li> <li>There 1.5 metre spacing between the trees.</li> </ul>	<ul style="list-style-type: none"> <li>There is increased number wild animals living in the mangrove forest compared to the past.</li> <li>Mangrove forest reduces the wind velocity during cyclone which was evidenced during the last cyclone.</li> </ul>
30	Rajnagar WL/ Rajnagar/ Satavaia Satavaia/ Mangrove Plantation	<ul style="list-style-type: none"> <li>Very dense mangrove forest observed.</li> </ul>	<ul style="list-style-type: none"> <li>The mangrove forest prevents the intrusion of sea water into habitation.</li> <li>Previously the fallow land turned into green cover due to the mangrove plantation.</li> </ul>

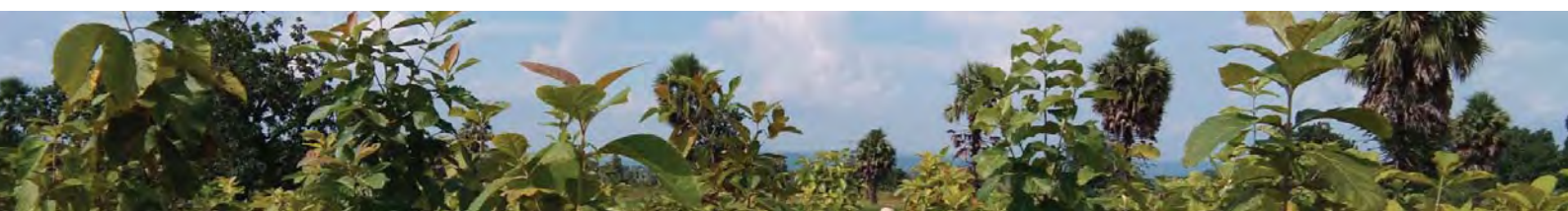


## 7.8 Performance Analysis of other than Plantation Activities

### 7.8.1 Roads, Culvert & Causeway

Table 7.27: Usability and Impacts of Roads, Culvert & Causeway [ Score on the basis of Usability and Type of Impact (10- Point Scale)]

Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
1	Forest Road/ Chandaka WL/ Chandaka WL/ Godibali/ Godibari	<ul style="list-style-type: none"> <li>Used by local people and forest department</li> <li>The road is blocked by trees and bushes on both sides of the road.</li> <li>The road is being repaired regularly after the rainy season.</li> </ul>	<ul style="list-style-type: none"> <li>All weather road and regularly used by habited people.</li> </ul>	8	High
2	Culvert/ -Chandaka WL/ Chandaka WL/ Godibari/ Bhola	<ul style="list-style-type: none"> <li>The culvert is Constructed on “Baunsanal”, a watercourse on Godibali-Kumarakhunti Road.</li> <li>The culvert connects villages located on both sides of the said watercourse.</li> <li>The approach road is constructed with 4 sides stone packing and of 12 meters of each side.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this culvert, two-wheeler users are finding it advantageous because previously, they were facing problems while coming by vehicles.</li> </ul>	9	High
3	Causeway/ Chandaka WL/ Chandaka WL/Godibari/ Bhola	<ul style="list-style-type: none"> <li>Facilitates over flow of water in rain season.</li> <li>The causeway is found in good condition and no structural defect is observed.</li> </ul>	<ul style="list-style-type: none"> <li>It prevents soil erosion and damage of the road.</li> </ul>	8	High
4	Culvert/ Chandaka WL/ Dampara WL/ Bhagipur/ Gayalbanka	<ul style="list-style-type: none"> <li>Used for water crossing on forest road connecting to “Kanjia nallah”, a perennial water course.</li> <li>Both sides guard wall, of 1.5m depth, 5.5m length.</li> </ul>	<ul style="list-style-type: none"> <li>Easier to cross the water course.</li> </ul>	8	High
5	Culvert/ Puri/ Konark/ Konark/ Konark	<ul style="list-style-type: none"> <li>The culvert is constructed for easier approach to Nursery located by the side of Konark-Chandrabhaga Road.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this culvert become easier for vehicles to cross and transporting seedlings from nursery in rainy season</li> </ul>	8	High





Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
6	Forest Road/ Puri/ Konark/ Konark/ Konark	<ul style="list-style-type: none"> <li>It connects the watch tower. However, the condition of this road is not good.</li> <li>Murrom spread on the road is observed lacking.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this road, there is more visitors' footfall at the watch tower and department people able to easily monitor.</li> </ul>	6	Medium
7	Forest Road/ Puri/ Balukhand/ Balukhand/ Phulpatana	<ul style="list-style-type: none"> <li>11 kms long distance forest road is constructed inside Balukhand sanctuary.</li> </ul>	<ul style="list-style-type: none"> <li>Facilitate better movement of people to Balukhand sanctuary in all seasons.</li> <li>There is more tourist's footfall on the sanctuary site after the creation of this forest road.</li> </ul>	8	High
9	Forest Road/ Rajnagar/ Kanika/ Dangamal/ Bhitarkanika	<ul style="list-style-type: none"> <li>The forest road of 1 km is from Bhitarkanika Jetty to watch Tower.</li> <li>Due to rain, top layer morum on the road is worn out.</li> </ul>	<ul style="list-style-type: none"> <li>Used by department people for approaching watch tower.</li> <li>There is better tourists' footfall on the site.</li> <li>It has become more convenient for patrolling.</li> </ul>	8	High
10	Forest Road/ Rajnagar/ Kanika/ -Kanika/ Kanika	<ul style="list-style-type: none"> <li>Need to be developed because the top layer mourum on the road is worn out.</li> <li>Only sandy soil on the road with both side dense forest</li> </ul>	<ul style="list-style-type: none"> <li>Improved communication facilities used by forest department of visitors in all weather.</li> </ul>	6	Medium
11	Culvert/ Rajnagar/ Kanika/ Bhitarkanika/ Bhitarkanika	<ul style="list-style-type: none"> <li>Situated inside the forest road approaching to Suajor crick herbal point.</li> <li>Need guard wall on four sides to control the soil erosion.</li> </ul>	<ul style="list-style-type: none"> <li>It is easy to cross the existing water course.</li> </ul>	6	Medium
12	Causeway/ Khordha/ Ranpur/ Betuli/ Betuli	<ul style="list-style-type: none"> <li>Located on forest road and diverts surplus water to adjacent agriculture fields.</li> </ul>	<ul style="list-style-type: none"> <li>Life saving irrigation support to paddy crop.</li> </ul>	8	High



Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
13	Culvert/ Khordha/ Ranpur/ Korodegula/ Bhetabara	<ul style="list-style-type: none"> <li>The culvert is created on the forest road from Betuli to Dhuanali and the culvert is made using three home pipes.</li> <li>However, due to last heavy rain the approaching road from both sides to culvert is damaged.</li> </ul>	<ul style="list-style-type: none"> <li>The villagers of Betuli and forest department people using the stated road are benefitted.</li> <li>Local people easily access market and forest people easily undertake patrolling.</li> </ul>	8	High
14	Culvert/ Khordha/ Ranpur/ Betuli/ Betuli	<ul style="list-style-type: none"> <li>The culvert is constructed on the discharge channel of an existing water body.</li> </ul>	<ul style="list-style-type: none"> <li>It becomes easier to cross the channel by the forest department people. Thus better watch and word in plantation sites.</li> </ul>	8	High
15	Forest Road/ Khordha/ Ranpur/ Korodapal/ Bhetabara	<ul style="list-style-type: none"> <li>Forest road created under CAMPA and further improved to a pitch road by revenue department.</li> </ul>	<ul style="list-style-type: none"> <li>Due to pitch road and consequently it is not animal friendly and no longer serves its intended purpose.</li> </ul>	3	Low
16	Causeway/ Nayagarh/ Mahipur/ Mahipur/ Gateri	<ul style="list-style-type: none"> <li>With the objective of diversion of surface runoff and to protect damage of the existing morum road, the causeway is created.</li> </ul>	<ul style="list-style-type: none"> <li>Due to such causeway, the road became an all-weather road for which forest department people are able to use four wheelers throughout the year.</li> </ul>	8	High
17	Forest Road/ Nayagarh/ Mahipur/ Mahipur/ Gateri	<ul style="list-style-type: none"> <li>Used by forest staff at the time of their mobility.</li> <li>However, it is observed, due to lack of drainage facility on the forest road, it is prone to quick depreciation.</li> </ul>	<ul style="list-style-type: none"> <li>Throughout year smooth patrolling by forest functionaries made easier.</li> </ul>	5	Medium
18	Culvert/ Nayagarh/ Mahipur/ Gateri	<ul style="list-style-type: none"> <li>The culvert is made on the forest road.</li> </ul>	<ul style="list-style-type: none"> <li>Used by forest staff for their day to day mobility.</li> </ul>	8	High
19	Forest Road/ Nayagarh/ Odagaon/ Kadamjhar	<ul style="list-style-type: none"> <li>The forest road connects two villages from Rohibanka to Chemedi.</li> </ul>	<ul style="list-style-type: none"> <li>It provides better mobility for forest department people.</li> </ul>	8	High





Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
20	Causeway/ Nayagarh/ Odagaon/ Odagaon/ Kadamjhar	<ul style="list-style-type: none"> <li>The causeway is constructed on the forest road.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this causeway, forest department easily undertakes mobility in all seasons and also causeway protects the road from rain water damage.</li> </ul>	8	High

### 7.8.2 Buildings

Table 7.28: Usability and Impacts Buildings Score on the basis of Usability and Type of Impact (10- Point Scale)

Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
1	Malkhana / Chandaka WL/ Chandaka WL/ Chandaka/ Baranga	<ul style="list-style-type: none"> <li>It is nearer to watch tower &amp; protection camp.</li> <li>Not used for storage of seized items.</li> </ul>	<ul style="list-style-type: none"> <li>Staff protection and security ensured.</li> </ul>	5	Medium
2	Forest Guard Quarter Chandaka WL/ Chandaka WL/-Godibali/ Bhola	<ul style="list-style-type: none"> <li>Used as residence purpose and forester staying with family</li> <li>Compound wall with barbed wire fencing of 79m</li> </ul>	<ul style="list-style-type: none"> <li>Easy and convenient for the forester to attend his duty.</li> <li>Efficiency improvement of forester.</li> </ul>	8	High
3	Range office Chandaka WL/ Chandaka WL/ Chandaka WL/ Chandaka WL	<ul style="list-style-type: none"> <li>Range office is functioning after shift from the old office.</li> <li>One officer room, one second officer room, one computer room, Hazzat for both male &amp; female with attached bathroom are available.</li> <li>Good quality construction is observed.</li> </ul>	<ul style="list-style-type: none"> <li>Smooth functioning of office and field work improved.</li> </ul>	7	High



Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
4	Anti-Poaching Gate Chandaka WL/ Bhubaneswar WL/Bharatpur/ Bharatpur	<ul style="list-style-type: none"> <li>Entry gate to Chandaka WL sanctuary.</li> <li>Well maintained check gate with watcher shed is present.</li> </ul>	<ul style="list-style-type: none"> <li>Helped to control poaching activities.</li> </ul>	9	High
5	Watch Tower/ Chandaka WL/ Bhubaneswar WL/ Bharatpur/ Bharatpur	<ul style="list-style-type: none"> <li>The asset is currently used for aerial view of Chandaka sanctuary and to watch the elephant movement.</li> </ul>	<ul style="list-style-type: none"> <li>Controlled the poaching activities</li> <li>Helped to track cattle movement in the forest and meadows are saved from cattle grazing.</li> <li>Inside Chandaka sanctuary, towards the city side, poacher's movement is checked.</li> </ul>	8	High
6	Seizure Yard/ Chandaka WL/ Bhubaneswar WL/ Bhubaneswar/Bhubaneswar	<ul style="list-style-type: none"> <li>It is used for the intended purpose for which it is created.</li> <li>A building is constructed where seized logs are stored.</li> </ul>	<ul style="list-style-type: none"> <li>Proper storage of seized vehicles and other items is ensured.</li> </ul>	7	High
7	Barrack / Chandaka WL/ Bhubaneswar WL/ Bhubaneswar/Bhubaneswar	<ul style="list-style-type: none"> <li>Forest squad are staying there temporarily</li> <li>Anti-poaching Staffs are staying there.</li> <li>Situated near to office.</li> </ul>	<ul style="list-style-type: none"> <li>All the para staff and squad are accommodated when required and developed team work.</li> <li>Immediate assistance of squads to officers when required made available.</li> </ul>	8	High
8	Forester office cum residence / Chandaka WL/ Bhubaneswar WL/ Bhubaneswar/Bhubaneswar	<ul style="list-style-type: none"> <li>Presently used as Forester's quarter as well as Forester's office.</li> </ul>	<ul style="list-style-type: none"> <li>Convenient stay of the Forester which was not possible earlier. It has developed added to his work efficiency.</li> </ul>	9	High





Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
9	Forest Guard Quarter/ Chandaka WL/ Bhubaneswar WL/ Bhubaneswar/ Bhubaneswar	<ul style="list-style-type: none"> <li>Residence purpose</li> <li>No one is staying.</li> <li>Maintenance is required.</li> </ul>	<ul style="list-style-type: none"> <li>The quarter remains vacant.</li> </ul>	2	Low
10	Antipoaching shed / Chandaka WL/ Dampara WL/ Bhagipur/ Gayalbanka	<ul style="list-style-type: none"> <li>Temporarily used by Anti-Poaching squad</li> <li>Solar panel, solar fencing around camp shed</li> </ul>	<ul style="list-style-type: none"> <li>Poaching activities controlled.</li> </ul>	8	High
11	Forester office cum residence/ Chandaka WL/ DamparaWL/ Talabasta/ Kumarkhunti	<ul style="list-style-type: none"> <li>Residence Purpose</li> <li>Well maintained Quarter</li> </ul>	<ul style="list-style-type: none"> <li>Become easy to do night patrolling as and when required.</li> </ul>	7	High
12	Forest Guard Quarter City Forest/ Mancheswar/ Cuttack East/ Sagadi Patna	<ul style="list-style-type: none"> <li>Residence purpose</li> <li>One bedroom, one kitchen, one washroom, one drawing cum dining rooms are present there.</li> </ul>	<ul style="list-style-type: none"> <li>Staying facility of the forester is ensured and previously there was no quarter facility available for the forester.</li> <li>Improved social security and work efficiency.</li> <li>Forester is able to do his duty perfectly.</li> </ul>	8	High
13	Forest Guard Quarter City Forest/ Mancheswar/ Cuttack East/ Odapada	<ul style="list-style-type: none"> <li>Residence purpose</li> <li>One bedroom, one kitchen, one washroom, one drawing cum dining rooms are present there.</li> </ul>	<ul style="list-style-type: none"> <li>Helped forest guard suitable to do the patrolling activity perfectly. His ready availability in the sites ensured timely implementation of plantation activities.</li> </ul>	8	High



Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
14	Compound wall City Forest/ Mancheswar/ Rasulgarh/ Rasulgarh	<ul style="list-style-type: none"> <li>Surrounds range office</li> <li>Two separate boundary wall 70m &amp; 30m</li> </ul>	<ul style="list-style-type: none"> <li>Protection of range office ensured and it also checked unauthorized entry of outsiders into the range office compound.</li> </ul>	9	High
15	Common Toilet City Forest/ Mancheswar/ Rasulgarh/ Rasulgarh	<ul style="list-style-type: none"> <li>Toilet purpose</li> <li>Attached to City forest office building and used by staff</li> </ul>	<ul style="list-style-type: none"> <li>Toilet facility are available to staff that helped to control open urinal. Increased sense of sanitation among staff and people.</li> </ul>	8	High
16	Forester office cum residence City Forest/ Bhubaneswar/ Khandagiri west/ Patrapada	<ul style="list-style-type: none"> <li>Currently being used.</li> <li>Two bedrooms, one Kitchen, one washroom, one dinning cum drawing rooms are available there.</li> </ul>	<ul style="list-style-type: none"> <li>Due to falling of tree branches during last cyclone "Foni", overhead tank and asbestos are damaged.</li> </ul>	6	Medium
17	Range office City Forest/ Bhubaneswar/ Khandagiri west/ Patrapada	<ul style="list-style-type: none"> <li>The Range office is functioning from this building.</li> <li>Hazat both male and female, officer room, second washroom available, 40ft x 33ft = 181320 sq. ft, building maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Official works have been done smoothly which was not possible previously due to congestion of space in the previous building.</li> </ul>	8	High
18	Barrack/ City Forest/ Bhubaneswar Khandagiri west/ Patrapada	<ul style="list-style-type: none"> <li>Presently squad and staff are staying in ground flower</li> </ul>	<ul style="list-style-type: none"> <li>Ready availability of para staff to provide immediate service whenever required.</li> </ul>	8	High
19	Malkhana City Forest/ Bhubaneswar/ Khandagiri west/ Patrapada	<ul style="list-style-type: none"> <li>Currently being used.</li> <li>Two wide doors on front side and backside of Malkhana is technically designed.</li> <li>Roof is made of plastic sheet with truss type structure.</li> </ul>	<ul style="list-style-type: none"> <li>Used for storage of seized forest items.</li> </ul>	8	High





Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Ranking
20	Compound wall City Forest/ Bhubaneswar/ Khandagiri east/ Deulipatna	<ul style="list-style-type: none"> <li>Not used.</li> <li>Boundary wall damaged due to "Foni", last cyclone in Odisha</li> </ul>		3	Low
21	Forest Guard Quarter City Forest/ Bhubaneswar/ Khandagiri east/ Deulipatna	<ul style="list-style-type: none"> <li>In use</li> <li>Over Head Tank is present there.</li> </ul>	<ul style="list-style-type: none"> <li>Forest Guard stays here and it has helped him to perform his duties properly.</li> </ul>	8	Medium
22	Barrack Puri Konark/ Konark/Konark	<ul style="list-style-type: none"> <li>Staying facility for Antipoaching &amp; Protection squad.</li> <li>DEO is also staying in one of the rooms.</li> <li>Ground floor being used as garage for parking office vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>Barracks is indeed used as multi utility centre.</li> </ul>	6	Medium
23	Common Toilet Puri/Konark/ Konark/Konark	<ul style="list-style-type: none"> <li>Male toilet has used by office staffs</li> <li>No maintenance provision under CAMPAs scheme</li> </ul>	<ul style="list-style-type: none"> <li>Provided toilet facilities to outsiders as well as others. Greater service of sanitation with staff and visitors.</li> </ul>	5	Medium
24	Range Office Puri/Konark/ Konark/Konark	<ul style="list-style-type: none"> <li>Range office is functioning smoothly from this building.</li> </ul>	<ul style="list-style-type: none"> <li>Previously range office was an asbestos roofed congested building.</li> <li>Due to this new building, there is better functioning of the office.</li> </ul>	9	High
25	Common Toilet Puri/Gop/Gop/ Gop	<ul style="list-style-type: none"> <li>Male toilet has used by office staffs</li> <li>No maintenance provision under CAMPAs scheme</li> </ul>	<ul style="list-style-type: none"> <li>It has provided toilet facilities to outsiders as well as others.</li> </ul>	4	Medium



Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
26	Forest Guard Quarter Puri/ Gop/ Nimapada/ Nimapada	<ul style="list-style-type: none"> <li>Quarter is vacant for time being</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard can stay, but presently remains unused.</li> </ul>	7	Medium
27	Forester office cum residence Puri/ Gop/ Nimapada/ Nimapada	<ul style="list-style-type: none"> <li>Present Inside nursery</li> </ul>	<ul style="list-style-type: none"> <li>Currently not used.</li> </ul>	3	Low
28	Range Office Puri/Gop/Gop/ Gop	<ul style="list-style-type: none"> <li>Official purpose</li> <li>One officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, washroom, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Smooth functioning of range office is ensured.</li> </ul>	8	High
29	Compound wall Puri/Konark/ Konark/Konark	<ul style="list-style-type: none"> <li>Surrounded the fabricated protection shed</li> <li>Barbed wire fencing is provided</li> </ul>	<ul style="list-style-type: none"> <li>Improved safety of building.</li> </ul>	8	High
30	Fabricated protection shed Puri/Konark/ Konark/Konark	<ul style="list-style-type: none"> <li>used properly</li> <li>Watchers, patrolling party are staying here</li> </ul>	<ul style="list-style-type: none"> <li>Watchers, patrolling party are staying here</li> </ul>	6	Medium
31	Nursery shed Puri/ Balukhand/ Balukhand/ Balukhand	<ul style="list-style-type: none"> <li>Used by nursery watcher</li> <li>No plantation stock is there. Damaged in Fani. Fencing damaged in Fani</li> </ul>	<ul style="list-style-type: none"> <li>Only a shed is there and open field.</li> <li>Availability of space for stocking of seedlings and planting materials.</li> </ul>	6	Medium
32	Malkhana Puri/ Balukhand/ Balukhand/ Balukhand	<ul style="list-style-type: none"> <li>Used to store seized forest products.</li> <li>It is used as meeting hall</li> </ul>	<ul style="list-style-type: none"> <li>Proper storage of seized forest produce made easy.</li> </ul>	8	High





Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
33	Forester office cum residence Puri/ Balukhand/ Balukhand/ Balukhand	<ul style="list-style-type: none"> <li>Residence purpose</li> <li>Well maintained Quarter.</li> </ul>	<ul style="list-style-type: none"> <li>Forester use this as residence cum office purpose.</li> <li>It has increased his work efficiency with better staff coordination and supervision.</li> </ul>	8	High
34	Forest Guard Quarter Puri/ Balukhand/ Balukhand/ Balukhand	<ul style="list-style-type: none"> <li>Occupied by Forest guard</li> <li>One bedroom, one kitchen, one washroom, One drawing cum dining rooms are present there. Annual maintenance can be done</li> </ul>	<ul style="list-style-type: none"> <li>Improved social security of forest guard and his availability for proper execution of forest activities.</li> </ul>	8	High
35	Protection shed Puri/ Balukhand/ Balukhand/ Balukhand	<ul style="list-style-type: none"> <li>used by protection squad</li> <li>Maintenance is required.</li> </ul>	<ul style="list-style-type: none"> <li>Para staff and protection staff used to take rest in the shed.</li> </ul>	8	High
36	Barrack Puri/ Balukhand/ Balukhand/ Balukhand	<ul style="list-style-type: none"> <li>Forest squads are staying there.</li> <li>It can accommodate many forest squads at a time. Enough space is available.</li> </ul>	<ul style="list-style-type: none"> <li>Helped the forest squads to do proper patrolling.</li> </ul>	7	High
37	Range Office Puri/ Balukhand/ Balukhand / Balukhand	<ul style="list-style-type: none"> <li>One officer's room, one computer room, one second officer room, two hazat with attached toilet for gents and ladies, common space, electricity, washroom, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Range office functioned from own building with all required facilities. It has increased the work efficiency.</li> </ul>	8	High
38	Seizure yard Puri Balukhand/ Balukhand/ Balukhand	<ul style="list-style-type: none"> <li>To seize forest Highs</li> <li>Boundary wall is present. Damaged in Fani</li> </ul>	<ul style="list-style-type: none"> <li>Used to store safely seized items.</li> </ul>	8	High



Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
39	Protection shed Puri/ Balukhand/ Balighar/ Haingara	<ul style="list-style-type: none"> <li>Not used</li> <li>Not used because it is damage by Fani</li> </ul>	<ul style="list-style-type: none"> <li>Solar panel was damaged in Fani. Compound wall damaged in Fani.</li> </ul>	3	Low
40	Protection shed/Puri/ Balukhand/ Balukhand/ Phulpatana	<ul style="list-style-type: none"> <li>Inside sanctuary, protection squad are staying</li> </ul>	<ul style="list-style-type: none"> <li>Timely patrolling work made easy.</li> </ul>	7	Medium
41	Compound wall Puri/ Balukhand/ Balukhand/ Phulpatana	<ul style="list-style-type: none"> <li>Surrounding building Not damaged in Fani</li> <li>However some parts have been damaged</li> <li>Surrounding by the sanctuary</li> </ul>	<ul style="list-style-type: none"> <li>Protected restricted Spoted Deer movement while coming to Marin drive Road</li> </ul>	8	High
42	Compound wall Puri/Gop/Gop/ Gop	<ul style="list-style-type: none"> <li>Surrounds building</li> <li>Surrounds the office complex</li> </ul>	<ul style="list-style-type: none"> <li>Restricted public entry and improved office building safety.</li> </ul>	8	High
44	Forest Guard Quarter Bhadrak/ Chandbali/ Chandbali/ Chandbali	<ul style="list-style-type: none"> <li>Occupied by FG, Chandbali</li> <li>Not indicate scheme details on the wall</li> </ul>	<ul style="list-style-type: none"> <li>Earlier he was adjusted in barrack but after completion shifted to this building which is easy to stay. Made easier for his to undertake forest activity.</li> </ul>	9	High
45	Jetty Dock wall Bhadrak/ Chandbali Chandbali/ Chandbali	<ul style="list-style-type: none"> <li>Lunching speed boat</li> <li>Required some missionary work to avoided problems in rainy season</li> </ul>	<ul style="list-style-type: none"> <li>Due to availability of speed boat it become easier to control capture the anti poaching activities.</li> </ul>	9	High
46	Forest Guard Quarter Bhadrak/ Chandbali/ Karanjamal/ Karanjamal	<ul style="list-style-type: none"> <li>Used by Karanjmal Forester for residence.</li> <li>It should be repaired as soon as possible</li> </ul>	<ul style="list-style-type: none"> <li>Due to old building it needs to be repaired.</li> </ul>	3	Low





Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
47	Forester office cum residence Bhadrak/ Bhadrak / Agarpada/ Agarpada	<ul style="list-style-type: none"> <li>Currently anti-poaching squad were staying in the Forester residence.</li> <li>The storage items should have shifted hence it is a staff quarter</li> </ul>	<ul style="list-style-type: none"> <li>Office space used as store room</li> <li>As it has used for the other purpose forester has staying in Guard quarter</li> </ul>	3	Low
48	Forest Guard Quarter Bhadrak/ Bhadrak / Agarpada/ Agarpada	<ul style="list-style-type: none"> <li>One bed room with attached toilet &amp; Bath room used by Forest Guard</li> </ul>	<ul style="list-style-type: none"> <li>Become easier to do office and site work. Enhanced work efficiency of forest guard.</li> </ul>	9	High
49	Antipoaching shed Bhadrak/ Bhadrak / Agarpada/ Agarpada	<ul style="list-style-type: none"> <li>Being used by Ant poaching squared</li> <li>Bath room and Toilet is not so clean</li> <li>Take rest in day time by anti-poaching staff which was adjusted in a Guard quarter</li> </ul>	<ul style="list-style-type: none"> <li>Helped in controlling anti poaching cases.</li> </ul>	6	Medium
50	Compound wall Bhadrak/ Bhadrak / Agarpada/ Agarpada	<ul style="list-style-type: none"> <li>150 running wall with wire fencing in top of the wall</li> <li>Barbed wire fencing is provided</li> </ul>	<ul style="list-style-type: none"> <li>More safety and restrict public unnessary entry.</li> </ul>	9	High
51	Barrack Bhadrak/ Dham Nagar/ DhamNagar/ DhamNagar	<ul style="list-style-type: none"> <li>Occupied by patrolling staff and the Graze being used by same staffs</li> <li>It has been used to take rest in day time by poaching staffs which was creating problem earlier before construction of building</li> </ul>	<ul style="list-style-type: none"> <li>Well furnish building and convenient to stay in day time. Patrolling work of forest staff made easy.</li> </ul>	6	Medium
52	Range Office Bhadrak/Dham Nagar/Dham Nagar/ Dham Nagar	<ul style="list-style-type: none"> <li>It has operated in own building but earlier the office has operated in rented building</li> <li>Power charges and internet facilities should be adjusted from CAMPA Management fund</li> <li>Hazats are not used for same purpose</li> </ul>	<ul style="list-style-type: none"> <li>Improved work efficiency of range officer due to availability of required office facilities.</li> </ul>	8	High



Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
53	Forester office cum residence Bhadrak/ Dham Nagar/ Dham Nagar/ DhamNagar	<ul style="list-style-type: none"> <li>Combined constructed 2 FG quartera</li> <li>Sized items have been kept inside residence</li> <li>Building is not in well condition that require maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>The asset is used for the storage of seized items.</li> </ul>	3	Low
54	Compound wall Bhadrak/ Dham Nagar/ DhamNagar/ Dhobal	<ul style="list-style-type: none"> <li>Constructed 310 mtr. Compound wall covering to 4 sides</li> <li>Should be maintain in specific interval</li> </ul>	<ul style="list-style-type: none"> <li>Increased the office safety and privacy which was not maintained earlier.</li> </ul>	8	High
55	Forest Guard Quarter Bhadrak/ Dham Nagar/ DhamNagar/ Dhobal	<ul style="list-style-type: none"> <li>Commonly constructed 2 FG quarter</li> <li>The estimate cost of the building is appropriate due to departmental construction. Previously Dhobal FG staying in the old quarter which was not so safety but now he has comfortable staying with his family</li> </ul>	<ul style="list-style-type: none"> <li>Helped in increasing security and work efficiency of forest guard.</li> </ul>	8	High
56	Common toilet Bhadrak/ Dham Nagar/ DhamNagar Dhobal	<ul style="list-style-type: none"> <li>Used by staffs partially</li> <li>Should be regularly cleaned which will increase the usefulness.</li> <li>Inadequate water supply causes problem for cleanness of the toilet.</li> </ul>	<ul style="list-style-type: none"> <li>To some extent increased civic sense among staff.</li> </ul>	4	Poor
57	Range Office Chilika/ Tangi/ Tangi/Tangi	<ul style="list-style-type: none"> <li>Model Range office</li> <li>No provision of electric duty of Range office</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of field of office activities made easier for the range officer.</li> </ul>	10	High
58	Forest Guard Quarter Chilika/Tangi/ Tangi/Tangi	<ul style="list-style-type: none"> <li>Vacant</li> <li>No wall panting or signboard of the building</li> </ul>	<ul style="list-style-type: none"> <li>Easily move and perfume his duty. Helped in easy movement and better performance of duties.</li> </ul>	8	High





Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Ranking
59	Malkhana Chilika/Tangi/ Tangi/ Tangi	<ul style="list-style-type: none"> <li>Storage the sized items</li> <li>Earlier seized boats are laying in open space of campus</li> <li>But these are inside the Malkhana</li> </ul>	<ul style="list-style-type: none"> <li>Seized items kept under lock &amp; key.</li> </ul>	9	High
60	Common toilet Chilika/ Tangi/ Tangi/ Tangi	<ul style="list-style-type: none"> <li>Both visitors and office staffs used it</li> <li>Need of maintenance provision in Scheme.</li> <li>Not indicate the scheme details on the wall</li> </ul> <p>Earlier no facilities inside campus for out sliders, but now this problem solved</p>	<ul style="list-style-type: none"> <li>Better knowledge of sanitation among staff and office visitors.</li> </ul>	8	High
61	Watch Tower Chilika /Tangi/ Mukteswar/ Mangala Jodi	<ul style="list-style-type: none"> <li>Observed the views of Mangalazodi bard century from Mangalajodi village.</li> </ul>	<ul style="list-style-type: none"> <li>Helped in watching bird movement and behaviour.</li> </ul>	6	Medium
62	Forest Guard Quarter Chilika/ Rambha/ Sorana/ Sunakhala	<ul style="list-style-type: none"> <li>Occupied by FG, Sunakhala</li> <li>It will be more effective if the department will do this work</li> </ul>		3	Poor
63	Forest Guard Quarter Chilika/ Rambha/ Keshpur/ Keshpur	<ul style="list-style-type: none"> <li>Accommodated in current FG quarter</li> <li>Earlier occupied in old quarter but now it is easier to stay</li> </ul>	<ul style="list-style-type: none"> <li>Ready availability of forest guard at the sight level improved.</li> </ul>	8	High
64	Forest Guard Quarter Chilika/ Rambha/ Keshpur Keshpur	<ul style="list-style-type: none"> <li>Occupied by Forest Guard of Keshpur</li> </ul>	<ul style="list-style-type: none"> <li>Ensured the regularities of Guard at head quarter</li> </ul>	8	High



Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
65	Forest Guard Quarter Chilika/ Rambha/ Rambha/ Rambha	<ul style="list-style-type: none"> <li>1st floor used in rest shed purpose and ground floor used on residential purpose</li> <li>Two stars building for multipurpose used with all accommodated facilities</li> </ul>	<ul style="list-style-type: none"> <li>Improved security and safety of forest guard.</li> <li>Increased work efficiency of forest guard in implementation of forest activities.</li> </ul>	9	High
66	Malkhana Chilika/ Rambha/ Rambha/ Rambha	<ul style="list-style-type: none"> <li>Seized Item storage in safety condition</li> <li>Condition of building is good no need of maintenance</li> <li>Storage some unused office assets. The structure has been constructed as per norms</li> </ul>	<ul style="list-style-type: none"> <li>Seized materials kept in safe custody and lock and key.</li> </ul>	8	High
67	Forest Guard Quarter Chilika/ Rambha/ Pitital Nandal	<ul style="list-style-type: none"> <li>Currently occupied by FG, Pitital</li> <li>Project details should be reflected in wall of the building as per norms. Easier to accommodate</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard abled to perform assigned responsibilities easily.</li> </ul>	6	Medium
68	Forester office cum residence Chilika/ Rambha/ Pitital/Pitital	<ul style="list-style-type: none"> <li>Occupied by Forester Pitital</li> <li>Water supply from tube well by temporally connected of motor</li> </ul>	<ul style="list-style-type: none"> <li>Control the fire wood theft</li> </ul>	8	High
69	Watch Tower Chilika/ Rambha Keshpur/ Keshpur	<ul style="list-style-type: none"> <li>Tourist cum to see the Chilika view</li> <li>More no. of cottage can be constructed to stay at night for visitors. More scope for ecotourism development.</li> </ul>	<ul style="list-style-type: none"> <li>Helped in controlling forest related crime cases.</li> </ul>	6	Medium
70	Residence of Ranger Chilika/ Satapada/ Satapada/ Satpada	<ul style="list-style-type: none"> <li>RO currently staying</li> <li>Should be rename of the Scheme in wall indication APO, Scheme &amp; cost of project</li> </ul>	<ul style="list-style-type: none"> <li>Easy to perform office and field responsibilities as compared to earlier situation.</li> </ul>	8	High





Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
71	Forest Guard Quarter Chilika/ Balugaon/ Parikud/ Parikud	<ul style="list-style-type: none"> <li>Occupied by Parikud forest guard</li> <li>Need of pipe water supply from nearest habitations</li> <li>No adequate sweet water layer for drinking purpose and collected from far distance every day</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard previously adjusted in old quarter. Now it is convenient to stay and look after plantation activities at the site level.</li> </ul>	6	Medium
72	Forest Guard Quarter Chilika/ Satapada/ Satapada Satpada	<ul style="list-style-type: none"> <li>Temporally staying the dolphin squad team</li> <li>Frequently pow cut became to stay difficult</li> </ul>	<ul style="list-style-type: none"> <li>Previously staying in old quarter which is not so comfortable to stay. It helped in carrying out field activities easily.</li> </ul>	7	Medium
73	Forest Guard Quarter Chilika/ Satapada/ Satapada /Satpada	<ul style="list-style-type: none"> <li>Residential use</li> <li>Accommodated by family</li> </ul>	<ul style="list-style-type: none"> <li>Improved security and greater efficiency of forest guard.</li> </ul>	8	High
74	Forest Guard Quarter Chilika/ Satapada/ Satapada/ Satpada	<ul style="list-style-type: none"> <li>Occupied by Dolphin Guard</li> <li>Easier to watch &amp; ward the Dolphin movement in Satpada area</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring properly and no. of poaching case pointed out. Facilitated proper monitoring by forest staff and no of poaching cases reported reduced.</li> </ul>	8	High
75	Forest Guard Quarter Chilika/ Satapada/ Satapada/ Manikpatna	<ul style="list-style-type: none"> <li>Occupied by Guard of Manikpatna</li> <li>Surrounding of campus should be cleaned properly.</li> </ul>	<ul style="list-style-type: none"> <li>Controlled the fire wood collection due to existing of the infrastructure.</li> </ul>	5	Medium
76	Forester office cum residence Rajnagar/ Kanika Dangamal/ Dangamal	<ul style="list-style-type: none"> <li>Residence purpose</li> </ul>	<ul style="list-style-type: none"> <li>Convenient stay of forester ensured and that helped him in easy implementation of departmental works.</li> </ul>	8	High



Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
77	Ticket counter cum watch shed Rajnagar/ Kanika/ Dangamal	<ul style="list-style-type: none"> <li>Ticket Counter</li> <li>Easy for ticket booking</li> </ul>	<ul style="list-style-type: none"> <li>Made easy for visitors to get tickets. Helped in generating departmental revenue.</li> </ul>	9	High
78	Jetty Rajnagar Kanika/ Talachuan/ Kalibhadjadia	<ul style="list-style-type: none"> <li>Due to leakage it is not used now</li> <li>Another Jetty should be constructed so that it will be usable for the purpose of connection to Brahmani-Baitarani Delta Area.</li> </ul>		3	Low
79	Forester office cum residence Rajnagar/ Kanika/ Talachuan/ Talachuan	<ul style="list-style-type: none"> <li>All facilities like drinking water &amp; electricity are available there</li> </ul>	<ul style="list-style-type: none"> <li>Earlier forester was staying at old asbestos building &amp; now it is in well located Talchuan market place. It has improved security and work performance as compared to earlier situation.</li> </ul>	8	High
80	Forester office cum residence Rajnagar/ Gahirmatha/ Barunei/ Sasanpetta	<ul style="list-style-type: none"> <li>Being used by forester of Barunei</li> </ul>	<ul style="list-style-type: none"> <li>Helped the forester to do proper monitoring, coordination and implementation of forest activities.</li> </ul>	8	High
81	Barrack Rajnagar/ Gahirmatha/ Sasanpetta/ Sasanpetta	<ul style="list-style-type: none"> <li>Residential use by forester</li> <li>Anti poaching squad should be accommodated here who are living in a old building.</li> <li>There is no name plate. Can be accommodated by Anti Poaching or Protection squad</li> </ul>	<ul style="list-style-type: none"> <li>Well furnished building for staying of squads who are able to take up patrolling activities when required.</li> </ul>	9	High





Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
82	Seizure Yard Rajnagar/ Gahirmatha/ Gahirmatha/ Sasanpeta	<ul style="list-style-type: none"> <li>Seized boat/trailer are observed there</li> <li>Artificial channel can be done and renovation of present seizure yard can be done to accommodate more number of boats.</li> </ul>	<ul style="list-style-type: none"> <li>Availability space for accommodation more number of seized boats.</li> </ul>	8	High
83	Watcher Shed Rajnagar/ Rajnagar/ Satavaya/ Satavaya	<ul style="list-style-type: none"> <li>Temporarily used, regularly</li> <li>Solar electrification can be done to stay.</li> </ul>	<ul style="list-style-type: none"> <li>Made sea patrolling easy for forest staff.</li> </ul>	7	Medium
84	Forest Guard Quarter Rajnagar/ Rajnagar/ Satavaya / Satavaya	<ul style="list-style-type: none"> <li>Residential use</li> <li>Need of a boundary wall.</li> </ul>	<ul style="list-style-type: none"> <li>Made to control poaching activity</li> </ul>	6	Medium
85	Compound wall/Rajnagar/ Mahakal Pada/ Batighara/ Batighara	<ul style="list-style-type: none"> <li>Protection for FG quarter, rest shed</li> <li>It has an iron gate in entry point prevent to public entry.</li> </ul>	<ul style="list-style-type: none"> <li>Improved the safety and security of forest guard residence/ quarter.</li> </ul>	9	High
86	Forest Guard Quarter Rajnagar/ Mahakal Pada/ Batighara/ Batighara	<ul style="list-style-type: none"> <li>Residential</li> <li>Suitable location and usability</li> </ul>	<ul style="list-style-type: none"> <li>Helped in improving the work efficiency of forest guard.</li> </ul>	9	High
87	Barrack Rajnagar/ Mahakal Pada/ Jambu/Jambu	<ul style="list-style-type: none"> <li>Residential</li> <li>Alternative use only</li> <li>Used by para staff, squad for staying.</li> </ul>	<ul style="list-style-type: none"> <li>Ready availability of para staff for patrolling.</li> </ul>	9	High
88	Forester office cum residence Rajnagar/ Mahakal Pada/ Jagat Jore/ Jagat Jore	<ul style="list-style-type: none"> <li>Earlier staying in rented building, now convenient for staying</li> </ul>	<ul style="list-style-type: none"> <li>Made easy in implementing office and field activities.</li> </ul>	8	High
89	Compound wall Rajnagar/ Mahakal Pada/ Jagat Jore Jagat Jore	<ul style="list-style-type: none"> <li>Boundary wall in front side with two number of iron gates</li> <li>Completed the permanent boundary around 160 ft</li> </ul>	<ul style="list-style-type: none"> <li>Safety and security ensured.</li> </ul>	8	High



Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
90	Watch tower Khordha/ Ranpur / Korodegula Bhetabara	<ul style="list-style-type: none"> <li>Watch Tower is used for aerial observation of forest</li> <li>Observe the elephant movement</li> </ul>	<ul style="list-style-type: none"> <li>Helped in elephant tracking and taking suitable actions.</li> </ul>	8	High
91	Range Office Khordha/ Ranpur/ Ranpur/ Ranpur	<ul style="list-style-type: none"> <li>One officer room, one second officer room, one computer room, Hazzat for both male &amp; female with attached bathroom are available.</li> <li>The building is currently being used as Range Office,</li> </ul>	<ul style="list-style-type: none"> <li>Official work can be done smoothly</li> </ul>	8	High
92	Forest Guard Quarter Khordha/ Khordha/ Bologarh Patabandha	<ul style="list-style-type: none"> <li>Not in use</li> <li>No one is staying</li> </ul>		3	Low
93	Range Office Khordha/ Khordh Godokhodha	<ul style="list-style-type: none"> <li>One officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Official work done smoothly and helped range officer in proper execution and implementation of official and field activities.</li> </ul>	8	High
94	Forest Guard Quarter Khordha/Tangi /Bhusandpur Rameswar	<ul style="list-style-type: none"> <li>In use</li> </ul>	<ul style="list-style-type: none"> <li>Safety of forest guard ensured. No of field visits increased as the quarter is near to the forest sites.</li> </ul>	8	High
95	Forest Guard Quarter Khordha/ Ranpur/ Korodapal Bhetabara	<ul style="list-style-type: none"> <li>Used for residential purpose</li> </ul>	<ul style="list-style-type: none"> <li>Made easy to timely implementation of forest activities.</li> </ul>	8	High





Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
96	Barrack Khordha/ Ranpur/ Korodapal Bhetabara	<ul style="list-style-type: none"> <li>Residential</li> <li>2 storied, 7 squad members adjacent to FG quarters</li> </ul>	<ul style="list-style-type: none"> <li>Enabled Para staff to readily available and undertake their responsibilities easily.</li> </ul>	8	High
97	Check gate Khordha/ Ranpur/ Korodapal Bhetabara	<ul style="list-style-type: none"> <li>In use</li> <li>A wooden check gate was made under CAMPA, now converted to iron check gate</li> </ul>	<ul style="list-style-type: none"> <li>Used to check out vehicle entering into forest</li> </ul>	9	High
98	Compound wall Khordha/ Ranpur/ Korodapal Bhetabara	<ul style="list-style-type: none"> <li>In use</li> <li>Barbed wire fencing is provided</li> </ul>	<ul style="list-style-type: none"> <li>Increased Safety for building as compared to earlier situation.</li> </ul>	8	High
99	Range Office Khordha/ Tangi/ Tangi/ Tangi	<ul style="list-style-type: none"> <li>In use</li> <li>One officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Official work done smoothly with availabilities. It has promoted better working environment.</li> </ul>	9	High
100	Forest Guard Quarter Khordha/ Tangi/Tangi/ Tangi	<ul style="list-style-type: none"> <li>In use</li> </ul>	<ul style="list-style-type: none"> <li>It become easy to stay in site location and perform the duties in better manner.</li> </ul>	8	High
101	Renge Office Khordha/ Tangi/ Tangi/ Tangi	<ul style="list-style-type: none"> <li>In use</li> <li>One officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Ensured better functioning of range office. Available facilities helped in maintaining database and implementation of office and field activities.</li> </ul>	9	High



Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
102	Forest Guard Quarter Nayagarh/ Mahipur/ Mahipur/ Banua Sahi	<ul style="list-style-type: none"> <li>Used by Forest Guard</li> <li>It is 5 km away from office.</li> </ul>	<ul style="list-style-type: none"> <li>Forest Guard able to do the responsibilities more effectively.</li> </ul>	8	High
103	Malkhana Nayagarh/ Mahipur/ Mahitama Nuagarh	<ul style="list-style-type: none"> <li>Malkhana</li> <li>The seized Highs present in malkhana are Wood, cycles, Wheel and Danda of bullock cart etc.</li> </ul>	<ul style="list-style-type: none"> <li>Seized item has stored in safety condition.</li> </ul>	8	High
104	Compound wall Nayagarh/ Mahipur/ Mahitama Koradi	<ul style="list-style-type: none"> <li>Boundary wall for protection of forest office</li> <li>Barbed wire fencing is provided</li> </ul>	<ul style="list-style-type: none"> <li>Safety and privacy improved for building.</li> </ul>	8	High
105	Forester office cum residence Nayagarh/ Mahipur/ Mahipur Mahipur	<ul style="list-style-type: none"> <li>The building for forester office - cum - residence as in use.</li> <li>This is a high-quality building with tile floor</li> </ul>	<ul style="list-style-type: none"> <li>Since forest quarter situated in the premises of office, mobility and duty of forester made easy.</li> </ul>	8	High
106	Range Office Nayagarh/ Mahipur/ Mahipur Mahipur	<ul style="list-style-type: none"> <li>Used as office</li> <li>One officer room, one second officer room, one computer room, Hazzat for both male &amp; female with attached bathroom are available.</li> </ul>	<ul style="list-style-type: none"> <li>Helped smooth functioning of office and field activities.</li> </ul>	9	High
107	Forest Guard Quarter Nayagarh/ Odagaon/ Odagaon Kadamjhar	<ul style="list-style-type: none"> <li>Forest guard was staying with his family</li> <li>Due to this quarter FG made available anytime for joint mobility.</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard field mobility become easy.</li> </ul>	9	High
108	Common Toilet Nayagarh/ Odagaon/ Odagaon	<ul style="list-style-type: none"> <li>Officials and visitors used this common toilet.</li> <li>No of toilet cleanness</li> </ul>	<ul style="list-style-type: none"> <li>Open urinating reduced. Increased civic senses among staff and visitors.</li> </ul>	7	Medium
109	Ranger's Residence Nayagarh/ Odagaon/ Odagaon Odagaon	<ul style="list-style-type: none"> <li>Staircase is required so roof of the quarter can be used. Roof can be cleaned time to time so that durability of that building can be extended.</li> </ul>	<ul style="list-style-type: none"> <li>Helped in performing the office responsibilities better.</li> </ul>	8	High





Sl.	Asset Type / Division/ Range/ Section/ Bit	Current use and Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Ranking
110	Range Office Nayagarh/ Odagaon/ Odagaon/ Odagaon	<ul style="list-style-type: none"> <li>Used for official purpose of Odagaon</li> <li>Stapes is required, so that roof can be cleaned time to time.</li> </ul>	<ul style="list-style-type: none"> <li>Smooth functioning of office ensuring better staff coordination, field implementation and reporting etc.</li> </ul>	9	High
111	Forester office cum residence Nayagarh/ Khandapada/ Kantilo Banapur	<ul style="list-style-type: none"> <li>Forester of Kantilo staying in this building</li> <li>Drinking water facility should be available</li> <li>Structure quality is very High</li> </ul>	<ul style="list-style-type: none"> <li>Helped to implement office and field activities on time. Mobility of forester to field sites increased.</li> </ul>	8	High
112	Forester office cum residence Nayagarh/ Khandapada/ Singapada Nuapalli	<ul style="list-style-type: none"> <li>Not in use</li> <li>Forest guard quarter should be boundary wall, drinking water and healthy environment</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard having dual charges, so he didn't stay here. This forest guard quarter situated near to the habitation.</li> </ul>	3	Low
113	Range Office Nayagarh/ Khandapada/ Khandapada Khandapada	<ul style="list-style-type: none"> <li>officer staying here</li> <li>Officer staying in this building</li> <li>This building is fully tile flooring. It is situated 500 meter away from the office.</li> </ul>	<ul style="list-style-type: none"> <li>Improved the work efficiency of staff with available facilities.</li> </ul>	9	High
114	Range Office Nayagarh/ Khandapada/ Khandapada Khandapada	<ul style="list-style-type: none"> <li>Used as office</li> <li>One officer room, one second officer room, one computer room, Hazzat for both male &amp; female with attached bathroom are available.</li> </ul>	<ul style="list-style-type: none"> <li>This building is fully tile flooring</li> </ul>	8	High



Table 7.29: Usability of Nursery

Sl.	Site/ Division/ Range/ Section/ Beat	Type of current use and	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
1	Nursery/ Chandaka WL/ Bhubaneswar WL/ Bhubaneswar Bhubaneswar	<ul style="list-style-type: none"> <li>Used to grow saplings which can be used in planting operation</li> <li>Seed godown, Nursery shed, beds, Capacity-60,000</li> </ul>	<ul style="list-style-type: none"> <li>Able to provide saplings for creation of plantation in time</li> </ul>	6	Medium
2	Central Nursery/ Puri/ Konark/ Konark/ Konark	<ul style="list-style-type: none"> <li>Partly generated mango plantation with 12acre of area and rest of part are used in protected and Nursery</li> <li>1 lakh seedlings capacity, solar panel is partially damaged and gate is completely damaged due to Fani.</li> </ul>	<ul style="list-style-type: none"> <li>Availability of saplings as per the requirement and time.</li> </ul>	7	Medium
3	Central Nursery/ Puri/Gop/ Nimapada/ Nimapada	<ul style="list-style-type: none"> <li>Used to provide saplings for plantation</li> <li>Capacity 5 lakh seedling, well maintained nursery, no seedling available, most of the structure are damaged in Fani</li> <li>Barbed wire with pillar fencing are done</li> <li>Most of area has used</li> </ul>	<ul style="list-style-type: none"> <li>Quality seedlings available in time which is more cost effective as compared to pvt. supply.</li> </ul>	8	High
4	Central Nursery/ Khordha/Tangi/ Tangi/ Tangi	<ul style="list-style-type: none"> <li>Near about 70% area of nursery has not used</li> <li>3 night watcher staying</li> <li>poor maintenance</li> <li>Most of infrastructure constructed but not fully used yet</li> </ul>	<ul style="list-style-type: none"> <li>No such impact</li> </ul>	3	Low
5	Mega Nursery/ Nayagarh/ Mahipur/ Mahipur/ Sampada	<ul style="list-style-type: none"> <li>Mostly 60% area in use</li> <li>Seedlings of Mehagani, Pasta Badam, Pia Sal, Baula, Bahada, Jamun, Amla, Teak, Khaira, Radha Chuda, Krushna Chuda, Sirisa, Karanja, Neem, Mahaneem, Sisoo, Arjuna, Bamboo, Sal, Gambhari</li> </ul>	<ul style="list-style-type: none"> <li>Production and supply of better quality seedlings for raising plantation ensured.</li> <li>Generated labour intensive works and wage employment opportunities for forest fringe village people.</li> </ul>	8	High





Table 7.30: Usability of seizure yard and other wild life management

Sl.	Site/ Division/ Range/ Section/ Beat	Type of current use and	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
1	Meadow development/ Chandaka WL/ Chandaka WL	<ul style="list-style-type: none"> <li>Planted with para, Napier &amp; Humidculla variety of grasses.</li> <li>Weed eradication was done at first, then seed from outside sown area are taken, 3 breeds of grass are used Hybrid Napier, Para grass</li> </ul>	<ul style="list-style-type: none"> <li>Availability of Green Fodder for herbivorous animals (Deer, Elephant etc.).</li> </ul>	9	High
2	Maintenance of Elephant/ Trench/ Chandaka WL Chandaka WL/ Godibari Godibari	<ul style="list-style-type: none"> <li>Used to prevent elephant to move outside of Chandaka Forest</li> <li>The elephant trench is lined with stone for better maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>Movement of elephant to urban/ outside settlements controlled.</li> </ul>	8	High
4	Seizure Yard/ Chandaka WL Bhubaneswar WL/ Bhubaneswar/ Bhubaneswar	<ul style="list-style-type: none"> <li>Seized logs are kept back side of office.</li> </ul>	<ul style="list-style-type: none"> <li>Helped to store seized vehicles and other seized items in one place.</li> </ul>	8	High
5	Salt Lick Maintenance/ Chandaka WL/ Dampara WL Bhagipur/ Gayalbanka	<ul style="list-style-type: none"> <li>Used to fulfil mineral deficiency of herbivorous animals, although risk of poaching and hunting at the salt lick site.</li> <li>Pugmarks of deer's and sambar are observed in the forest for which creation of salt licks was very much needed.</li> </ul>	<ul style="list-style-type: none"> <li>This intervention made mineral supplements available to animals as per their need.</li> </ul>	8	High
6	Meadow development/ Chandaka WL/ Dampara WL Talabasta/ Kumarkhunti	<ul style="list-style-type: none"> <li>Used for cattle grazing purpose.</li> <li>The field is full of para, Napier &amp; Humidculla variety of grasses.</li> </ul>	<ul style="list-style-type: none"> <li>Wild animals come here frequently to meet their fodder requirements. The intervention met the food requirements of wild animals (Herbivorous).</li> </ul>	8	High



Sl.	Site/ Division/ Range/ Section/ Beat	Type of current use and	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
7	Meadow development/ Puri Konark/ Konark/ Konark	<ul style="list-style-type: none"> <li>Used for cattle grazing purpose.</li> <li>This was done under fodder cum meadow.</li> <li>Fodder trees like jamu, Bara, Amla are present.</li> <li>Grasses such as duba were also planted earlier.</li> </ul>	<ul style="list-style-type: none"> <li>The meadow development undertaken under CAMPA helped for meeting fodder requirements of wild animals.</li> </ul>	7	Medium
8	Meadow development/ Puri/ Balukhand/ Balukhand Balukhand	<ul style="list-style-type: none"> <li>Used for cattle grazing purpose</li> <li>Hemidicula grass is planted. Only one grass variety</li> </ul>	<ul style="list-style-type: none"> <li>Availability of green fodder for wild animals ensured.</li> </ul>	5	Medium
9	Seizure yard/ Puri/ Balukhand Balukhand/ Balukhand	<ul style="list-style-type: none"> <li>To seize forest Highs</li> <li>Boundary wall is present. Damaged in Fani</li> </ul>	<ul style="list-style-type: none"> <li>Safety storage of seized items ensured.</li> </ul>	7	Medium
10	G I Fencing/ Rajnagar/ Kanika Dangamal/ Dangamal	<ul style="list-style-type: none"> <li>It is created to restrict the entry of cattle inside the sanctuary area as well as exit chances of wild animals outside the sanctuary area.</li> </ul>	<ul style="list-style-type: none"> <li>As a result of GI Fencing, human animal conflict is reduced as reported by the forest officials.</li> </ul>	9	High
11	Seizure Yard/ Rajnagar Gahirmatha/ Gahirmatha Sasanpeta	<ul style="list-style-type: none"> <li>Seized boats/ trawlers were found kept at the seizure yard.</li> </ul>	<ul style="list-style-type: none"> <li>Due to creation of seizure yard, and consequently creation of space to accommodate seized items, number of trawlers being seized by the department has increased.</li> </ul>	8	High
12	Solar fencing/ Nayagarh/ Mahipur/ Mahipur/ Gateri	<ul style="list-style-type: none"> <li>Solar Fencing is created to restrict the exit of wild animals - elephant, Bison etc to the habitation.</li> <li>It also prohibits the unscrupulous people to enter into the RF area with evil intentions.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced the human animal conflict which was occurring many times previously.</li> </ul>	6	Medium





Table 7.31: Water Body and other water management structure

Sl.	Type of Assets/ Division/ Range/ Section/ Beat	Type of current use and	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
1	WHS/ Chandaka WL/ Chandaka WL/ Kantabada/ Kantabada	<ul style="list-style-type: none"> <li>Drinking &amp; bathing of Elephants.</li> <li>Need of renovation towards easier entry of wild animals.</li> </ul>	<ul style="list-style-type: none"> <li>In summer season, due to availability of water, the arrival of wild animals has been increased.</li> <li>Birds and peacocks were coming for drinking purpose.</li> </ul>	7	Medium
2	WHS/ Chandaka WL/ Chandaka WL/ Godibali/ Godibali	<ul style="list-style-type: none"> <li>Drinking &amp; bathing of Elephants.</li> <li>Soil moisture conservation is not taking place to the desired level owing to lower height of earthen bounds from each side.</li> </ul>	<ul style="list-style-type: none"> <li>Availability of water for drinking and bathing purpose of wild animals.</li> </ul>	7	Medium
3	Water Body/ Chandaka / Chandaka WL/ Godibari/ Godibari	<ul style="list-style-type: none"> <li>Grass patches created surrounding of water body.</li> <li>Need of renovation for preserving water throughout the year.</li> </ul>	<ul style="list-style-type: none"> <li>Used for elephant bathing and drinking.</li> <li>Used by other wild animals for drinking water.</li> </ul>	7	Medium
4	WHS/ Chandaka/ Chandaka WL/ Godibari/ Godibari	<ul style="list-style-type: none"> <li>Fishing by local people.</li> <li>Water is available throughout season.</li> </ul>	<ul style="list-style-type: none"> <li>Facilitated fishing as livelihood option by local people.</li> <li>Increased moisture conservation due to availability of water throughout the year.</li> </ul>	8	High
5	Water Body/ Chandaka WL/ Chandaka WL/ Kantabada/ Jhumka	<ul style="list-style-type: none"> <li>Used by wild animal for drinking purposes.</li> <li>Water is available throughout season. Due to grass patching less soil erosion, water conservation</li> <li>Plantation around water body.</li> </ul>	<ul style="list-style-type: none"> <li>Water availability round the year is found very much helpful for wild animals particularly for drinking purposes.</li> </ul>	8	High
6	Water Body/ Chandaka WL/ Dampara WL/ Dampada/ Pithakhia	<ul style="list-style-type: none"> <li>Wild animals' drinking &amp; bathing needs are met.</li> <li>Inlet &amp; Outlet is available with vented causeway.</li> </ul>	<ul style="list-style-type: none"> <li>Easy access to animals for drinking &amp; bathing purpose</li> </ul>	8	High



Sl.	Type of Assets/ Division/ Range/ Section/ Beat	Type of current use and	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
7	Water Body/ Puri/ Konark/ Ramchandi/ Kapileswar	<ul style="list-style-type: none"> <li>Used for drinking purpose by spotted Deer and other wild animal in evening and night hours.</li> </ul>	<ul style="list-style-type: none"> <li>Increased moisture soil supported increased growth of nearby plantations.</li> </ul>	8	High
8	Water Body/ Puri/ Gop/ Nimapada/ Nimapada	<ul style="list-style-type: none"> <li>The water body is found in good condition.</li> <li>Located inside central nursery.</li> </ul>	<ul style="list-style-type: none"> <li>It serves the drinking water needs of wild animals.</li> </ul>	8	High
9	Water body/ Chilika/ Rambha/ Pitisa/ Nandal	<ul style="list-style-type: none"> <li>Perennial water source being used by wild animals for drinking and bathing purposes.</li> <li>Also used by local people for bathing during work in the forest.</li> </ul>	<ul style="list-style-type: none"> <li>Wild animals like wild Boar, Peacock, Rabbit &amp; Porcupine come to the water body for drinking water mostly during summer seasons.</li> <li>For watering the nearby casuarina plantation, the water body was reported very much helpful.</li> </ul>	8	High
10	Water body/ Rajnagar/ Kanika/ Bhitarkanika/ Bhitarkanika	<ul style="list-style-type: none"> <li>Spotted deers come to the site for drinking water &amp; now crocodiles also find safe to stay there.</li> <li>Used for drinking purpose by wild animal</li> <li>The site is located in close proximity to the bird sanctuary.</li> </ul>	<ul style="list-style-type: none"> <li>Due to the water body, there is increased biodiversity in surrounding region.</li> </ul>	3	Low
11	Water body/ Khordha/ Ranpur/ Karadapal/ Sankhajodi	<ul style="list-style-type: none"> <li>Located adjacent to forest for which more wild animals come to the water body.</li> <li>Nearby community is benefitted for cattle bathing,</li> <li>Due to good depth, water is available throughout the year.</li> </ul>	<ul style="list-style-type: none"> <li>Water for wild animals round the year made available.</li> <li>Increase in soil moisture helped in proper growth of plantations.</li> </ul>	8	High





Sl.	Type of Assets/ Division/ Range/ Section/ Beat	Type of current use and	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
12	Water Body/ Nayagarh/ Mahipur/ Mahitama/ Jiginipada	<ul style="list-style-type: none"> <li>Mainly used by the wild animals as water is available throughout the year.</li> </ul>	<ul style="list-style-type: none"> <li>In migration of wild animals to the local forest has steadily improved soon after the creation of the water body.</li> </ul>	8	High
13	Water Body/ Nayagarh/ Khandapada/ Kantilo/ Rakesia	<ul style="list-style-type: none"> <li>Used by wild animals as well as local community.</li> <li>Water is available throughout the year.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced incidence of entry of wild animals into habitations.</li> <li>Helped in recharging of ground water in the forest fringe areas.</li> </ul>	8	High
14	Water body/ Rajnagar/ Kanika/ Bhitarkanika/ Bhitarkanika	<ul style="list-style-type: none"> <li>The existing water body was renovated.</li> <li>Compared to the depth of water body, the water retaining capacity is observed lower.</li> </ul>	<ul style="list-style-type: none"> <li>Water is available during rainy season only</li> </ul>	3	Low

## 7.9 Summary of Findings:

- Out of 31 plantation sites covered in the study, there are altogether 64 sample plots covering all plantation categories in all forest divisions. There is no plantation site in Bhadrak W/L division for which sample plots of plantation sites are not covered in Bhadrak W/L division. Maximum number of plantation sites are covered in Nayagarh WL followed by Khordha forest divisions.
- There are six types of AR plantation activities reported taken up under CAMPA intervention during the period 2009-2017 in Bhubaneswar circles
- The average length of avenue plantation is 5.7 kms found in City forest, Khorda and Puri divisions. The average area of Mangrove plantation is 100 hectares which is only found in Rajnagar W/L division. Compensatory Afforestation and Penal Compensatory Afforestation (CA-PCA) exclusively of mangroves is done in Rajnagar W/L division. However, CA-PCA of other plantation activities is taken up in City forest and Khordha forest divisions. Considering all plantation sites in all divisions, excluding avenue plantation, the overall average of plantation site is 48.6 hectares. The average area for block plantation, bald-hills plantation, CA-PCA (Mangrove), CA-PCA (mixed) is found at 49.3, 20.0, 88.0, and 7.1 hectares respectively.
- On the basis of year of plantation, it is found that, out of the overall plantation activities, about 21.9 percent were created in the initial years of CAMPA i.e.2009-10. Maximum proportion of plantation sites to the extent of 29.7 percent were created in the year 2014-15 followed by 2015-16.
- Avenue plantation, average percentage of overall casualty is 24.5 percent. Compared to the overall percentage of casualty, it is found higher in city forest and Puri W/L divisions. On the basis of casualty performance, the status of divisions undertaking AR plantation is ranked as high, medium and high.



- Bald hills plantations, the overall causality, as shown in the following table stands at 21.25 percent. Compared to the overall percentage of causality, it is found higher in Khurda division and lower in Nayagarh division.
- Block Plantation is carried out under four forest divisions and overall causality is about 22.2 percent. Compared to the overall casualty, it is found higher in Chilika W/L and Puri divisions. Following the causality ranking criteria, performance of Chandaka W/L is high, for Chilika W/L and Nayagarh, it is medium and for Puri W/L division it is low. Overall performance is also low.
- CA-PCA plantation is carried out under two forest divisions – city forest and Khordha forest divisions. Overall casualty is found 3.1 percent and performance of both the divisions on the basis of casualty performance is found high.
- CA- PCA mangrove is plantation is carried out only in Rajnagar W/L division. It is reported by the forest officials that mangrove plantation is done with 1.5 metres spacing and there is no casualty in such plantation. Due to nil casualty of such plantation, the performance of CA- PCA (mangrove) type of plantation is found high.
- The major tree species considered under CAMPA plantation are outlined. Badachakunda, Phasi and Jamun are three major species under avenue plantation; Akasia, Mangium and phasi are found to be the major species under bald hill plantations, Akasia, Kajurina and Bada Chakunda are the major species under Block Plantation. Teak and mangium species are found to be the major species under CA-PCA plantation.
- Considering all plantation categories and all the trees, the average maximum, minimum height is found at 6.66 metres. 3.79 metres respectively. Similarly, the difference between overall maximum and minimum GBH/GCH is found at 31.21 and 14.53 respectively.
- The average canopy density across plantations and forest divisions vary in the range between 0 to 100 percent. Due to last cyclone “Fani” in Odisha, the canopy density of avenue plantations of city forest and Khordha divisions has almost reached to nil level.
- The SMC performance of all such plantations is fixed low. On the other hand, on the basis of performance ranking scale which is expressed in terms of average siltation percentage, the overall performance of SMC activity considering all plantation types and all forest divisions is found high. Performance of SMC works in mangrove plantation is kept 100 percent because the basic objective behind such plantation is soil conservation in nature.
- Mainly staggered trenches, half-moon trenches and stone packing around trees are mainly found at plantation sites. Staggered trenches are found at 26.6 percent of the plantation sites and half-moon trenches with stone packing are found only in SSO bamboo sites.
- ANR with gap plantation is found in three forest divisions Chilika W/L, Khordha and Nayagarh forest divisions.
- Overall tree survival and causality in ANR Plantation is found at 86.9 and 13.1 percent respectively. Compared to overall survival of trees under ANR with gap plantation, it is found higher in Nayagarh and Chilika divisions and lower in Khordha divisions.
- The overall canopy percent for ANR with gap plantations is found at 35 percent.
- With respect to ANR with gap plantation, in all forest divisions, staggered trenches are found.
- CRM activity broadly covers SSO works, ANR without gap and conservation of old plantations and forest patches. SSO bamboo and SSO timber are the prominent CRM activities found in Bhubaneswar circle. The average area under SSO bamboo and SSO timber is found at 308.3 and 508.0 hectares respectively. With the objective of analyzing the performance of SSO bamboo and SSO timber, 15 SSO bamboo plots and 5 SSO timber plots were covered in the study.





- Analyzing the performance of SSO Bamboo activities on the basis of sample data of two sites in Khordha and Nayagarh, it is found that overall there are 125 clumps per hectare of forest area of which around 15.05 were damaged during the time of survey. On an average the number of first year, second year and third year culms is found at 560, 960 and 1265 respectively. As it is revealed in Table 8.19, the performance of SSO bamboo plantation of all forest divisions is found 'low'.

## 7.10 Suggestions

- As majority of forest divisions are wild life divisions, large scale meadow development programmes may be undertaken.
- Since majority of divisions under the forest circle are frequently vulnerable to cyclone risks, the tree species selected for different plantation programmes should be able to withstand wind pressures in the event of cyclone.
- There should be periodic maintenance provision of the infrastructural facilities created under CAMPA.
- Fuel supplied for trawlers engaged in sea patrolling at Rajnagar WL division is viewed insufficient. Increased amount of fuel may be provisioned for effective patrolling.
- The wild life protection squad who are patrolling at Babubali island under Rajnagar WL division were of the opinion that they often operated under risky circumstances for which they should be provided with necessary weapons for life saving in the event of any type untoward circumstances.

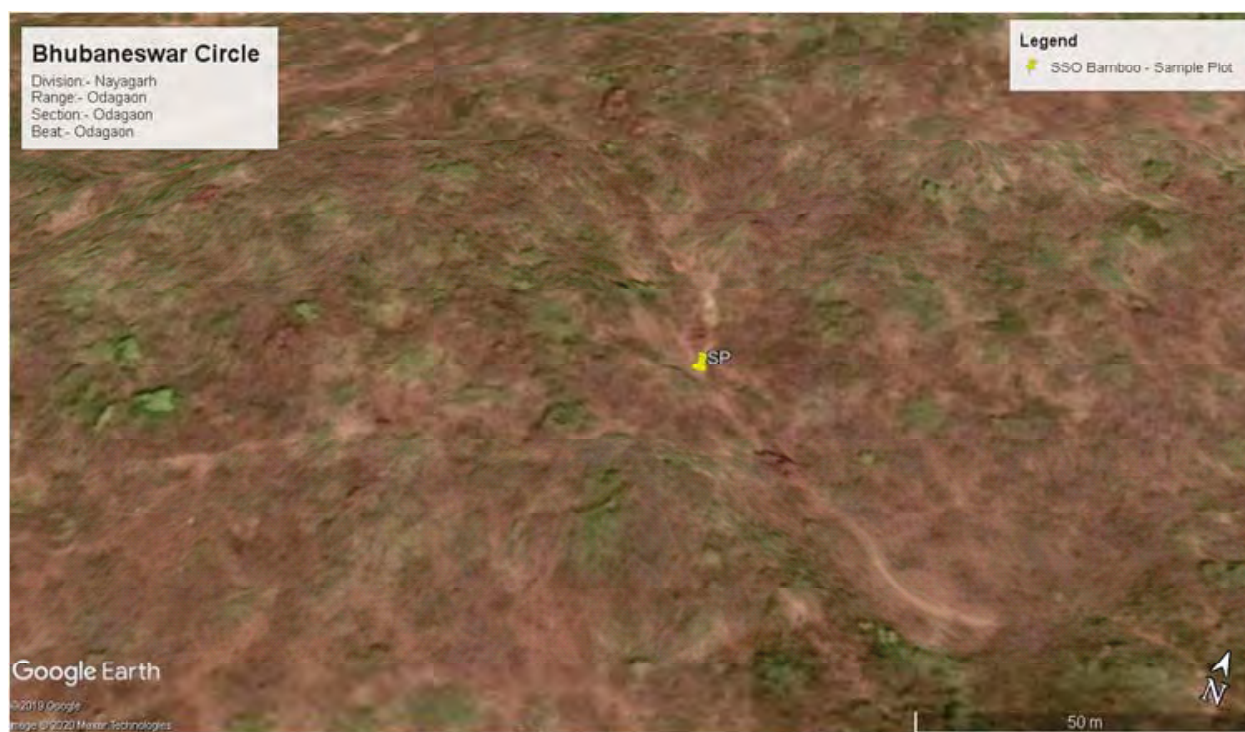
## 7.11 Satellite imagery of sample plots











## Annexure- I

## Tree &amp; year wise height &amp;GBH/GCH

Row Labels	Average of Max Height in Metre	Average of Min Height in Metre	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average Height (in Metre)	Average GBH/GCH (in CM)
Acacia auriculiformis	7.3	4.1	28.6	13.8	5.7	21.2
2009-10	9.3	5.2	39.5	16.2	7.3	27.9
2014-15	5.8	3.0	32.7	18.2	4.4	25.5
2015-16	10.0	7.0	30.0	18.0	8.5	24.0
2016-17	5.8	3.3	5.8	2.5	4.6	4.2
Ailanthus excelsa	6.0		75.0		3.0	37.5
2014-15	6.0		75.0		3.0	37.5
Badachakunda	8.6	5.4	35.9	15.1	7.0	25.5
2009-10	11.4	7.4	42.8	14.8	9.4	28.8
2014-15	6.0	4.0	35.3		5.0	17.7
2015-16	4.7	2.7	24.5	15.6	3.7	20.1
Banyan	1.5		14.5		0.8	7.3
2016-17	1.5		14.5		0.8	7.3
Bondari	3.5	2.0	13.0	8.5	2.8	10.8
2013-14	2.5	1.5	13.0	8.5	2.0	10.8
2103-14	4.5	2.5			3.5	0.0
Buni	6.0	4.0	30.3	16.2	5.0	23.3
2010-11	2.5	1.5			2.0	0.0
2013-14	6.0	4.5	30.3	16.2	5.3	23.3
2103-14	9.5	6.0			7.8	0.0
Cashew	1.0				0.5	0.0
2009-10	1.0				0.5	0.0
Casia siamia	3.0	1.5	16.1	9.6	2.3	12.9
2015-16	3.0	1.5	16.1	9.6	2.3	12.9
Casuarina	6.0	3.1	20.1	9.6	4.6	14.9
2009-10	8.0	3.7	40.0	18.7	5.9	29.4
2016-17	4.5	2.8	5.3	2.8	3.7	4.1
Chatiyani	5.7	4.0	27.9	20.6	4.9	24.3
2009-10	7.0	5.5	28.3	20.6	6.3	24.5
2015-16	3.0	1.0	27.2		2.0	13.6
Dot	3.0	2.0			2.5	0.0
2103-14	3.0	2.0			2.5	0.0
Gambhari	8.0	6.0	32.0	20.0	7.0	26.0
2015-16	8.0	6.0	32.0	20.0	7.0	26.0





Row Labels	Average of Max Height in Metre	Average of Min Height in Metre	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average Height (in Metre)	Average GBH/GCH (in CM)
Garani	1.5	1.8			1.7	0.0
2010-11	1.5	1.0			1.3	0.0
2103-14		2.5			1.3	0.0
Guan	5.0	3.5	16.2	10.2	4.3	13.2
2013-14	5.5	3.5	16.2	10.2	4.5	13.2
2103-14	4.5	3.5			4.0	0.0
Jamun	4.0	3.0	22.0	12.0	3.5	17.0
2015-16	4.0	3.0	22.0	12.0	3.5	17.0
Kalichua	6.0	4.5			5.3	0.0
2103-14	6.0	4.5			5.3	0.0
Karanja	5.5	3.0	31.4	16.7	4.3	24.1
2011-12	5.0	3.0	30.0	12.0	4.0	21.0
2014-15	6.0	3.0	32.7	21.3	4.5	27.0
Kathabadam	6.0	4.3	18.4	10.1	5.2	14.3
2010-11	6.0	4.3	18.4	10.1	5.2	14.3
Kegelia pinnata	4.5	3.0	32.9	21.7	3.8	27.3
2013-14	4.5	3.0	32.9	21.7	3.8	27.3
Keruan	8.8	5.5	42.9	16.6	7.2	29.8
2013-14	9.0	4.5	42.9	16.6	6.8	29.8
2103-14	8.5	6.5			7.5	0.0
Mahaneem	2.0	1.0	25.0		1.5	12.5
2010-11	2.0	1.0	25.0		1.5	12.5
Mangium	3.7	1.7	19.0	10.5	2.7	14.8
2015-16	3.7	1.7	19.0	10.5	2.7	14.8
Neem	3.9	2.4	32.9	16.6	3.2	24.8
2014-15	5.0	3.5	56.7	23.1	4.3	39.9
2015-16	4.0	2.0	19.4	10.1	3.0	14.8
2016-17	1.5	1.0	12.3		1.3	6.2
Panasa	4.0	2.0	28.0	20.0	3.0	24.0
2015-16	4.0	2.0	28.0	20.0	3.0	24.0
Patali	5.0	3.0	38.3	21.3	4.0	29.8
2014-15	5.0	3.0	38.3	21.3	4.0	29.8
Phasi	6.0	4.5	62.6	48.2	5.3	55.4
2013-14	6.0	4.5	62.6	48.2	5.3	55.4
Rai	6.0	3.7	28.2	16.1	4.9	22.2
2010-11	4.5	3.0			3.8	0.0
2013-14	6.0	3.5	28.2	16.1	4.8	22.2
2103-14	7.5	4.5			6.0	0.0
Salia Bamboo	14.3	7.0			10.7	0.0



Row Labels	Average of Max Height in Metre	Average of Min Height in Metre	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average Height (in Metre)	Average GBH/GCH (in CM)
2009-10	20.0	10.0			15.0	0.0
2015-16					0.0	0.0
2016-17	3.0	1.0			2.0	0.0
Simaruba	6.4	3.0	45.2	15.2	4.7	30.2
2009-10	7.3	3.3	50.0	15.8	5.3	32.9
2015-16	3.0	2.0	26.2	13.2	2.5	19.7
Simili	12.0	10.0	35.0	25.0	11.0	30.0
2015-16	12.0	10.0	35.0	25.0	11.0	30.0
Sindhika	5.5	3.4	28.4	16.7	4.5	22.6
2010-11	3.0	2.0			2.5	0.0
2013-14	6.0	3.6	28.4	16.7	4.8	22.6
2103-14	7.5	4.5			6.0	0.0
Sirisa	8.0	4.4	54.8	20.0	6.2	37.4
2009-10	8.0	4.3	49.0	18.0	6.2	33.5
2011-12	8.0	5.0	78.0	28.0	6.5	53.0
Sisoo	11.0	5.8	35.2	11.6	8.4	23.4
2009-10	11.8	6.0	27.8	9.3	8.9	18.6
2011-12	8.0	5.0	65.0	21.0	6.5	43.0
Teak	7.3	3.4	29.4	12.9	5.4	21.2
2009-10	10.6	4.6	32.6	12.6	7.6	22.6
2011-12	9.0	5.0	62.0	12.0	7.0	37.0
2014-15	5.5	2.5	27.3	17.3	4.0	22.3
2015-16	5.5	2.5	22.8	9.9	4.0	16.4
2016-17	1.0				0.5	0.0
Grand Total	6.7	3.8	31.2	14.5	5.3	22.9





## Annexure- II

## Major tree species

Sl.	Type of Trees	Number of trees per 10000 trees under CAMPA Plantations
1	Acacia auriculiformis	2939
2	Teak	2472
3	Casuarina	1233
4	Badachakunda	666
5	Casia siamia	405
6	Mangium	316
7	Phasi	265
8	Sirisa	217
9	Neem	193
10	Sisoo	166
11	Simaruba	161
12	Chatiyani	140
13	Jamun	127
14	Karanja	113
15	Patali	93
16	Salia Bamboo	85
17	Cashew	79
18	Panasa	79
19	Garani	72
20	Kathabadam	70
21	Banyan	38
22	Gambhari	32
23	Simili	19
24	Mahaneem	13
25	Kegelia pinnata	6
26	Ailanthus excelsa	2









A photograph of a dense forest with many thin, vertical tree trunks and a thick canopy of green leaves. The ground is covered in brown leaves and twigs. A white rectangular box is overlaid on the lower part of the image, containing the text "CHAPTER - VIII" in green.

## CHAPTER - VIII





## 8. Evidence of CAMPA Implementation in Koraput Circle:

### 8.1 Introduction:

Koraput forest circle is spread over four districts, namely Koraput, Malkangiri, Nabarangpur and Rayagada. The districts falling under the forest circle is known for its vegetation and bio-diversity. About 32.37 percent (8,727.70 sq. km.) of the total geographical area (26,962 sq. km.) of the four districts is covered under forest<sup>20</sup> (forest of different classifications). The districts witness a positive change in the forest cover area, excluding Malkangiri, in comparison to 2017 assessment. Very Dense Forest (VDF) is about 9.68 percent (844.65 sq. km.) of the total forest area and 3.13 percent of the total geographical area of the districts. Medium Dense Forest (MDF) (2,753.63 sq. km.) is 31.55 percent of the total forest area and 10.21 percent of the total geographical area of the districts in combination. Open forest is highest in the districts (combine), i.e., 58.77 percent (5,129.42 sq. km.) of the total forest area and 19.02 percent of the total geographical area of the circle districts. The Koraput forest circle is having five forest divisions, i.e., (1) Jeypore, (2) Koraput, (3) Malkangiri, (4) Nabarangpur and (5) Rayagada.

Table 8.1: Forest Area in Different Districts of the Circle

District	Geographical Area (GA) (in Sq. Km.)	2019 Assessment (in Sq. Km.)				% of GA	Change w.r.t 2017 Assessment
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total		
Koraput	8,807	94.48	740.41	1,263.38	2,098.27	23.83	9.27
Malkangiri	5,791	158	712.76	1,465.41	2,336.17	40.34	-5.83
Nabarangapur	5,291	172.63	447.04	527.08	1,146.75	29.48	43.75
Rayagada	7,073	419.54	853.42	1,873.55	3,146.51	44.49	20.51
Grand Total	26,962	844.65	2,753.63	5,129.42	8,727.70	32.37	

Source: ISFR, 2019

The district of Koraput is having geographical area of 8,807 sq. km. of which 94.48 sq. km is under very dense forest category, 740.41 sq. km. is moderately dense forest and 1,263.38 sq. km is open forest. Total forest area in the district is 23.83 percent of the total geographical area. There is a positive change in forest cover in the district, by 9.27 sq. km. in comparison to 2017 assessment. Total geographical area of Malkangiri district is 5,791 sq. km. of which 158 sq. km. is under very dense forest, 712.76 sq. km is moderately dense forest and 1,465.41 sq. km is open forest. Total forest area in the district is 2336.17 sq. km. Total forest area to the geographical area of the district is 40.34 percent which shows a decreasing trend by 5.83 sq. km. in comparison to 2017 assessment. Similarly, Nabarangpur and Rayagada is having forest area of 29.48 percent and 44.49 percent of the total geographical area of the district respectively. Both the districts reflect a positive change in forest area coverage, i.e., 43.75 sq. km. and 20.51 sq. km. in Nabarangpur and Rayagada respectively.

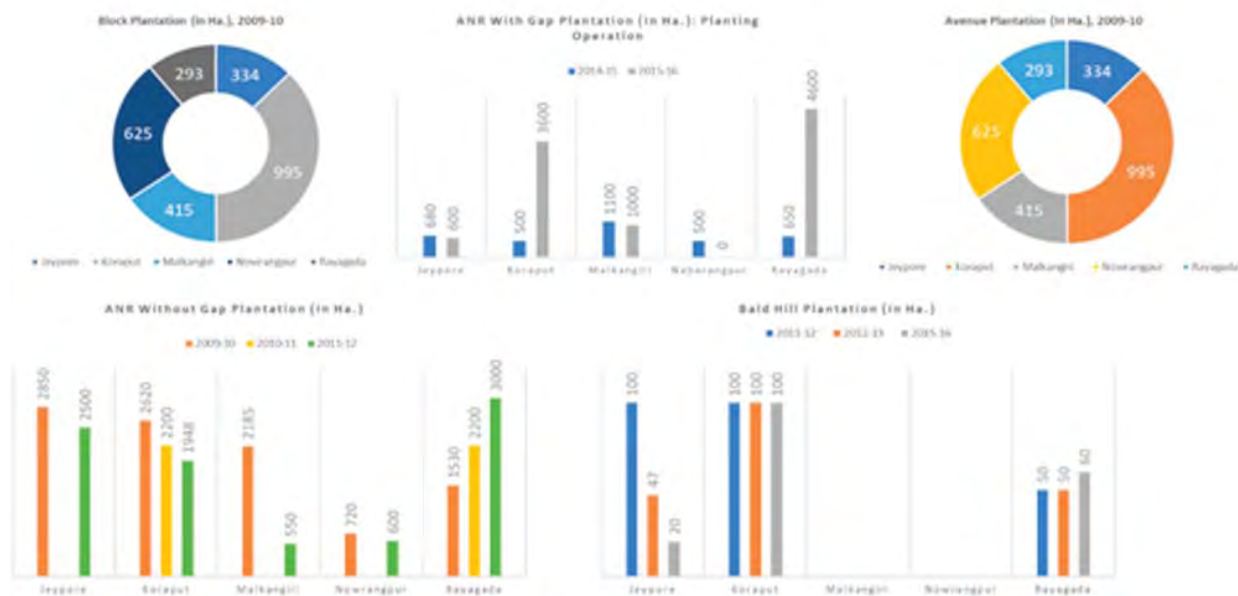
### 8.2 Plantation Activities:

Key plantation activities that have been taken up in the circle are block plantation, ANR with enrichment planting, bald hill plantation, avenue plantation and CA PCA. Block plantation was taken up in 2009-10,

<sup>20</sup> ISFR, 2019



covering a total area of 2,662 ha. ANR with gap plantation covered a total area of 3,430 ha. in 2014-15 and 9,800 ha. in 2015-16. Avenue plantation in the year 2009-10 covered a total area of 2,662 ha. In bald hill plantation, 250 ha. covered in the year 2011-12, 197 ha. in 2012-13 and 180 ha. in 2015-16.



*Figure 8.1: Plantation Activities*  
Source: Forest & Environment Dept.

### 8.3 Silvicultural Operation:

Under silvicultural operations, activities taken up are like SSO-Timber, SSO-Bamboo, ANR without Gap plantation, maintenance of old Teak plants and management of economic species. Apart from these, silvicultural operations / maintenance works were taken up for the area covered under plantation in different years, along with replacement for dead plants. ANR without gap plantation covered a total area of 9,905 ha. in 2009-10, 4,400 ha. in 2010-11 and 8,598 ha. in 2011-12. Silvicultural operation in Bamboo was taken up from 2009-10 to 2016-17 in different sites. Similarly, silvicultural operations in timber was taken up in 2013-14 in 15,890 ha. and in 17,022 ha. in 2014-15. Coverage of area under silvicultural operation under different categories are presented in the figure.







Figure 8.2: Silvicultural Operations  
Source: Forest & Environment Dept.

#### 8.4 Study Coverage:

The study covered all the five forest divisions of the circle under different components of CAMPA. The forest divisions covered are (1) Jeypore, (2) Koraput, (3) Malkangiri, (4) Nabarangpur and (5) Rayagada. Under the forest divisions, 16 ranges were covered under the study. Details are presented below. Under plantation and silvicultural operation component, the study covered 104 plots from 39 sites in 5 forest divisions, 15 forest ranges, 30 forest sections and 32 forest beats of the circle to understand CAMPA interventions.

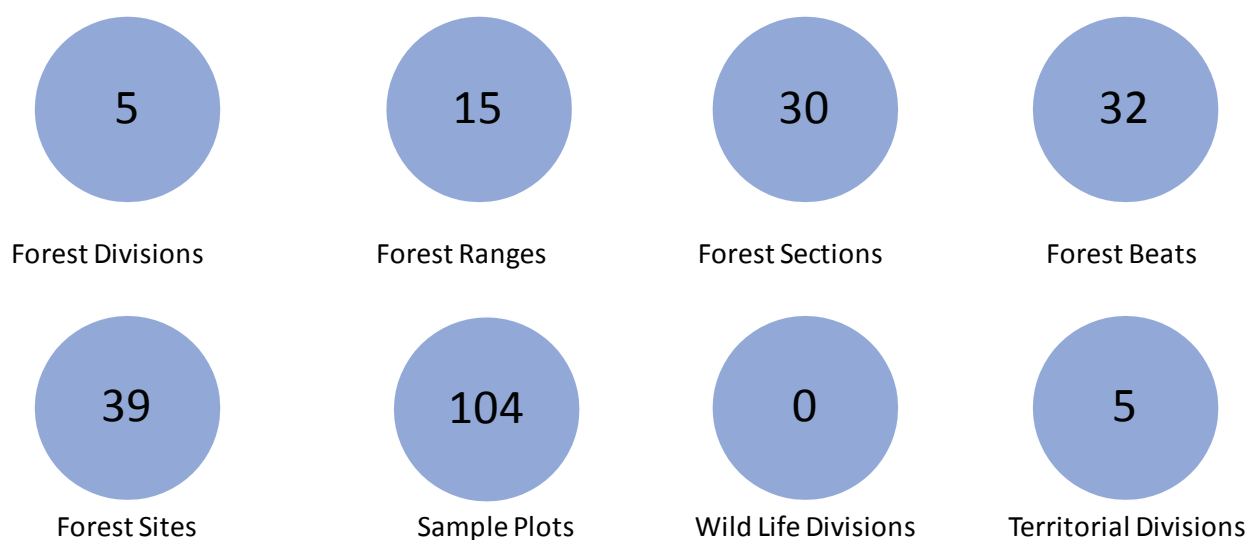


Figure 8.3: Assessment Coverage



## 8.5 Site Coverage:

The study covered 39 sites in five forest divisions, i.e., Jeypore, Koraput, Malkangiri, Nabarangpur and Rayagada. Of the total site coverage, 82.1 percent are plantation sites and 17.9 percent are sites with silvicultural operations. The plantation sites cover (1) ANR with gap plantation (46.9 percent), (2) bald hill plantation (15.6 percent), (3) bamboo plantation (6.3 percent) and (4) block plantation sites (31.3 percent). In silvicultural operation, the study covered (1) ANR without gap plantation (57.1 percent), (2) SSO-Bamboo (28.6 percent) and (3) SSO timber (14.3 percent).

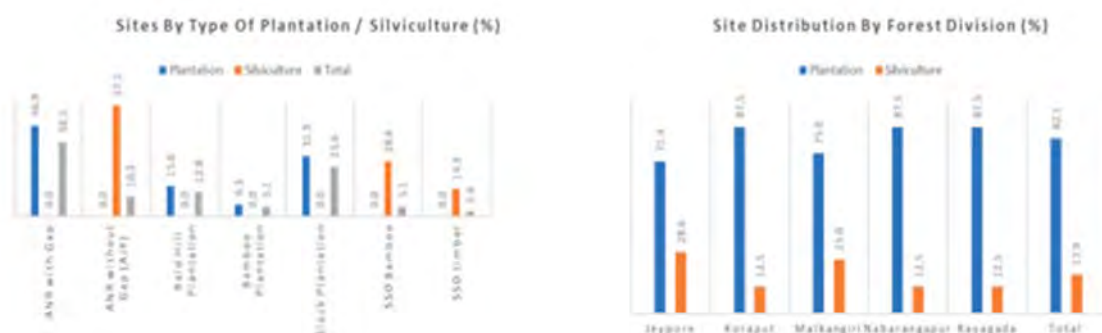


Figure 8.4: Site Distribution by Plantation / Silviculture and Forest Division

Of the total coverage, 82.1 percent are plantation sites (of different plantation categories) and 17.9 percent are for silviculture operations. Among the plantations, 46.9 percent sites are ANR with gap plantation, 15.6 percent are bald hill plantation, 6.3 percent are bamboo plantation and 31.3 percent are block plantation sites. Among the silviculture operations, 57.1 percent are ANR without gap, 28.6 percent are SSO Bamboo and remaining 14.3 percent are SSO timber. Circle and Division level distribution of sites are presented in the figures.

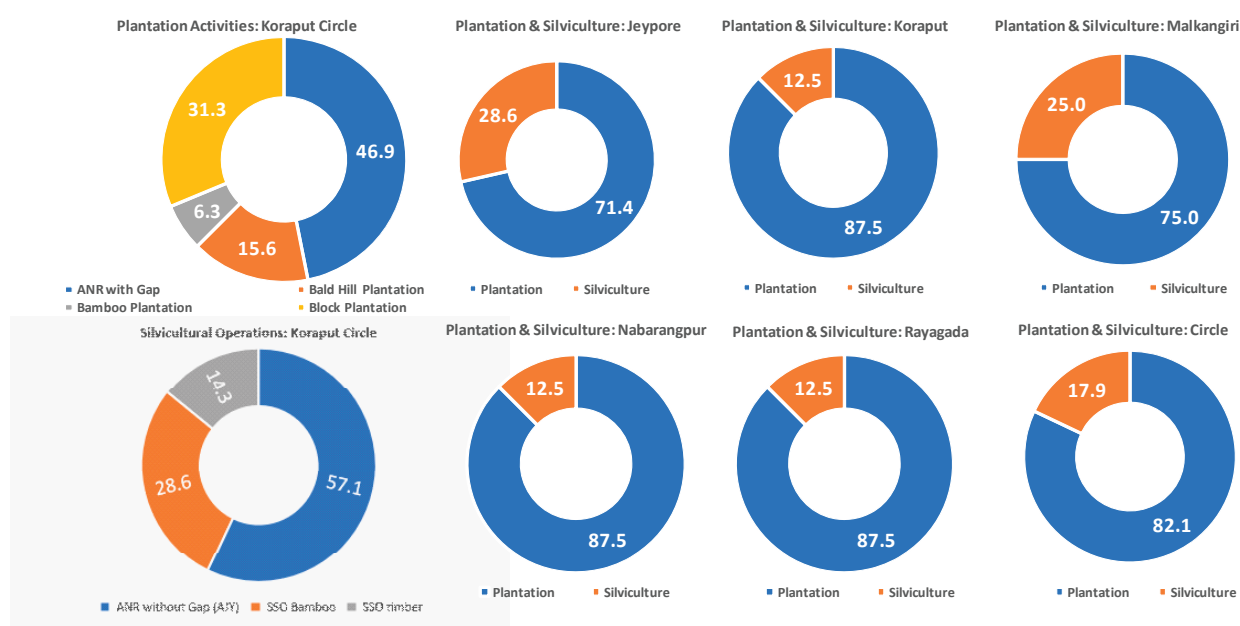
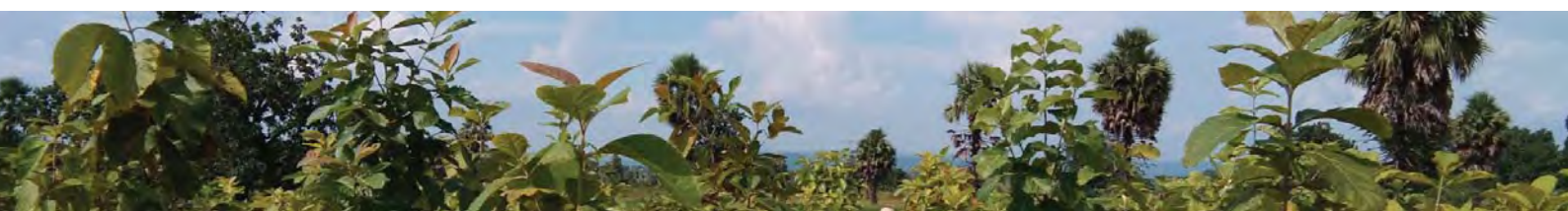


Figure 8.5: Plantation & Silvicultural Operation Distribution by Forest Circle & Division





## 8.6 Area of the Site:

Plantation in the circle covers a total area of 16628 ha. since 2009-10, i.e., on an average 2078.5 ha. per year, irrespective of type of plantation. Plantation by categories reflects that the circle has highest area of plantation under ANR with Gap Plantation category, followed by Block Plantation and Bald Hill Plantation. Similarly, under silvicultural operation, the area coverage remains to be 350948 ha., irrespective of operational typology.

Plantation activities and silvicultural operations have been taken up since 2009-10. Major plantation activities have been in the year 2009-10 (15.6 percent sites), 2014-15 (28.1 percent), 2015-16 (25.0 percent) and 2016-17 (18.8 percent). Plantation activities seems comparatively less in the years 2011-12, 2012-13 and 2013-14. Though silvicultural operations in different sites were in force, specific investments made for silvicultural operations under CAMPA from 2014-15. Year wise distribution of sites by plantation and silvicultural operation is presented in the figure.

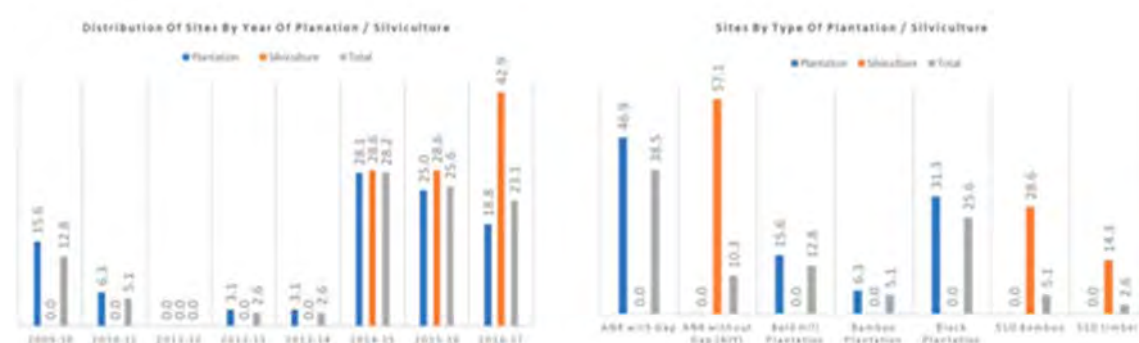


Figure 8.6: Distribution of Studied Sites by Year of Plantation

The average plantation area of the studied sites observed to be 89.1 ha. with total plantation area of 6,860 ha. Of the total plantation area, 54.01 percent are ANR with gap plantation, followed by Bamboo plantation (32.14 percent) and block plantation (12.61 percent). Bald hill plantation has been less, i.e., 1.24 percent.

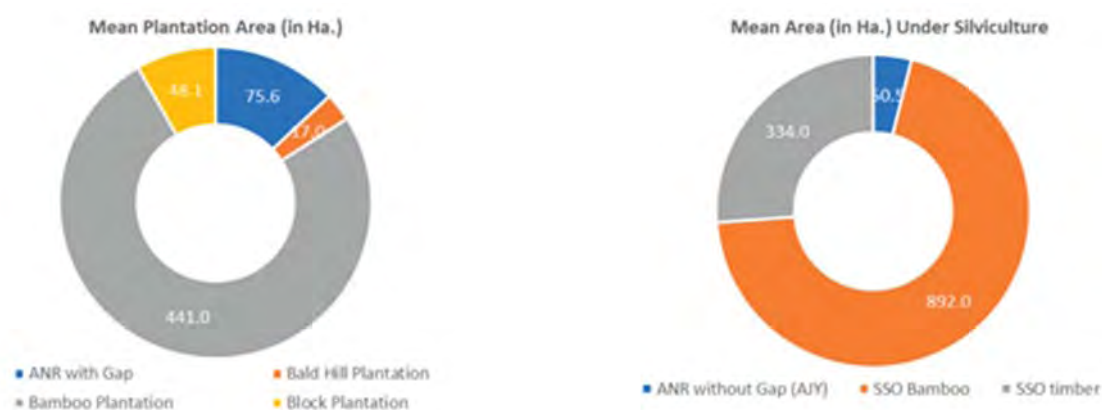
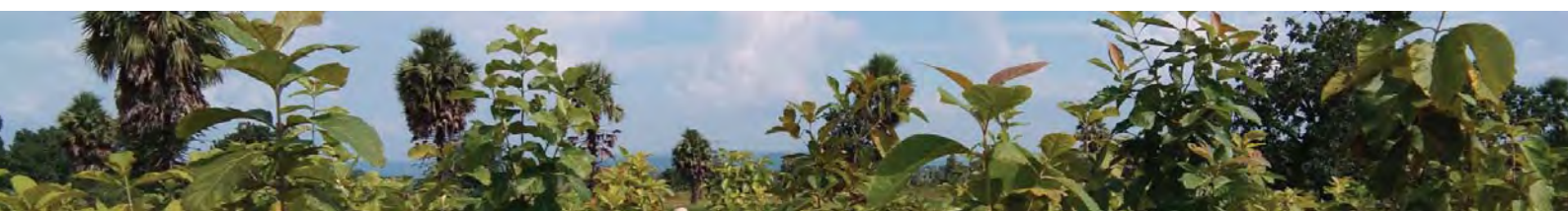


Figure 8.7: Mean Area (ha.) under Plantation and Silviculture by Type



Average area under silvicultural operation, irrespective of its type, is 414.7 ha. with total area of 11,196.00 ha. In the silvicultural operation, major emphasis has been given to SSO Bamboo (79.7 percent of the total area) followed by SSO-timber (14.9 percent of the total area). ANR without enrichment planting has been low among all the silvicultural operations (5.4 percent of the total area) in the circle.



Figure 8:8: Ranking of Plantation and Silvicultural Operations by Site

Ranking of the plantation sites, based on its area (ha.) reveals that 37.5 percent plantation area, irrespective of plantation category, are ≤ 25 ha. Same percentage of plantation sites are also in the category of > 25 and ≤ 50 ha. category. In the higher area categories, number of sites are less, i.e., 12.5 percent sites in > 75 and ≤ 100 category, 6.3 percent sites are in > 100 and ≤ 125 category and same percentage of sites (6.3 percent) are in > 200 area category. So, plantation activities have been taken up in the circle covering areas of different size where higher focus is to cover small patches of land that are below 50 ha. Similarly, silvicultural operations also have focus on small patches as well as bigger size of the area. In silvicultural operation, sites normally fall under > 25 and ≤ 50 ha. (42.9 percent sites), > 50 and ≤ 75 ha. (14.3 percent sites) and > 200 ha. (42.9 percent sites). There is no silvicultural operation in areas that are ≤ 25 ha., however, significant plantation activities have been taken up in patches of these categories. Ranking of plantation sites by area (ha.) for the forest circle and divisions are presented in diagrams.





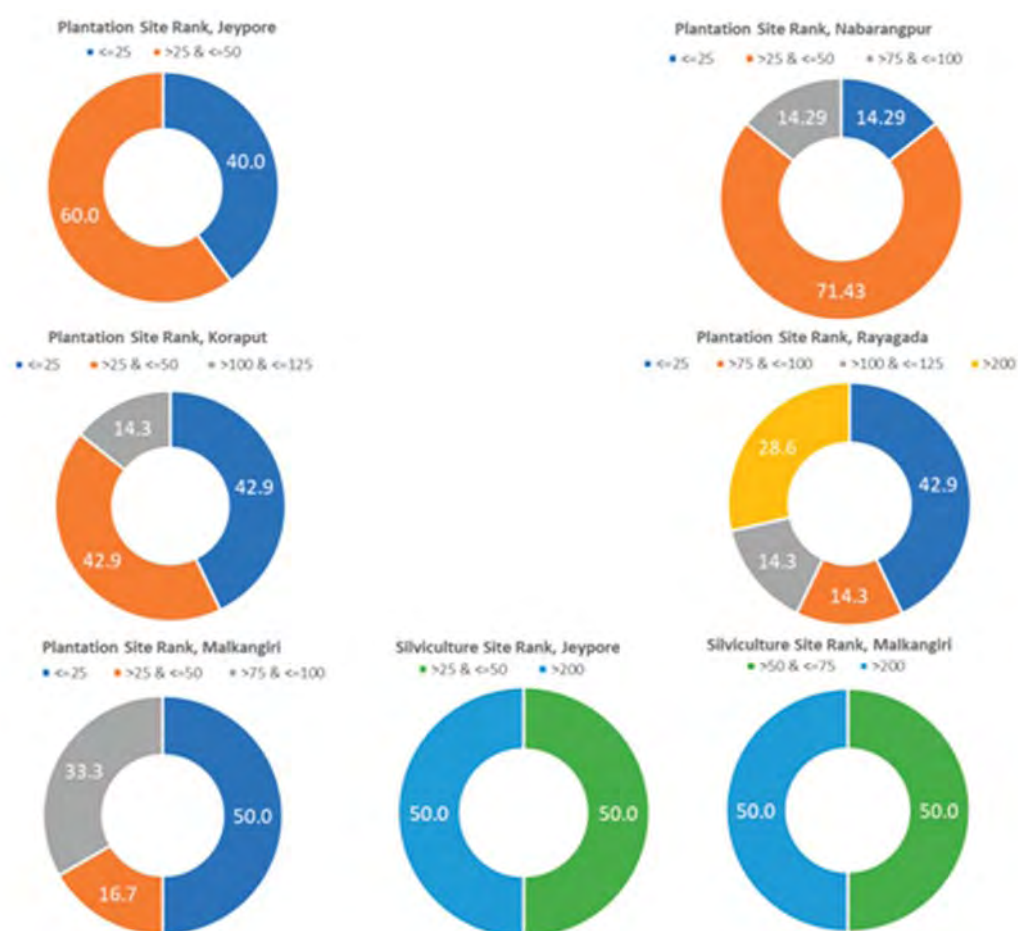
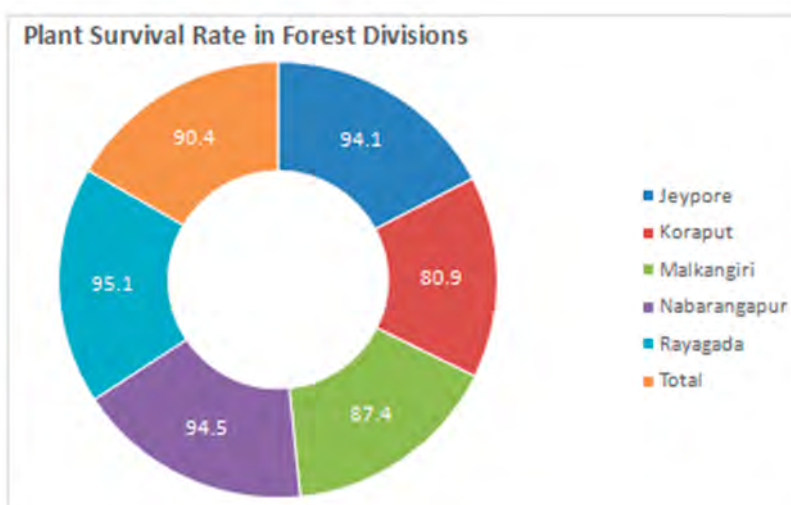


Figure 8:9: Ranking of Plantation & Silvicultural Operation by Forest Division

## 8.7 Plant Survival Rate:

Plant survival rate varies by plantation categories and also by forest divisions. Overall, Survival rate is calculated to be 90.4 percent. Highest plant survival is reported in Rayagada (95.1 percent) followed by Jeypore (94.1 percent). Comparatively less plant survival rate is reported in Koraput forest division (80.9 percent) followed by Malkangiri (87.4 percent). Plant survival rate by plantation categories are discussed below.



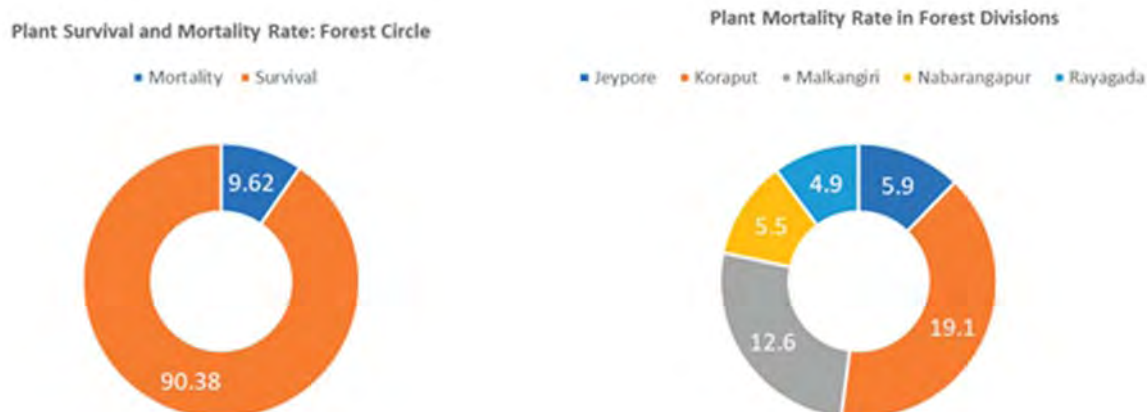


Figure 8:10: Overall Plant Survival Rate by Forest Divisions

### 8.7.1 Block Plantation:

Average number of plants per ha., varies considerably across sites, plots, by type of plantation and also by forest divisions. In block plantation, average no. of plants per ha. enumerated to be 1,474 with highest average number of plants in Nabarangpur (1596) and lowest in Malkangiri (1380). The plant survival rate varies from 86.3 percent (Malkangiri) to 97.8 percent (Jeypore).

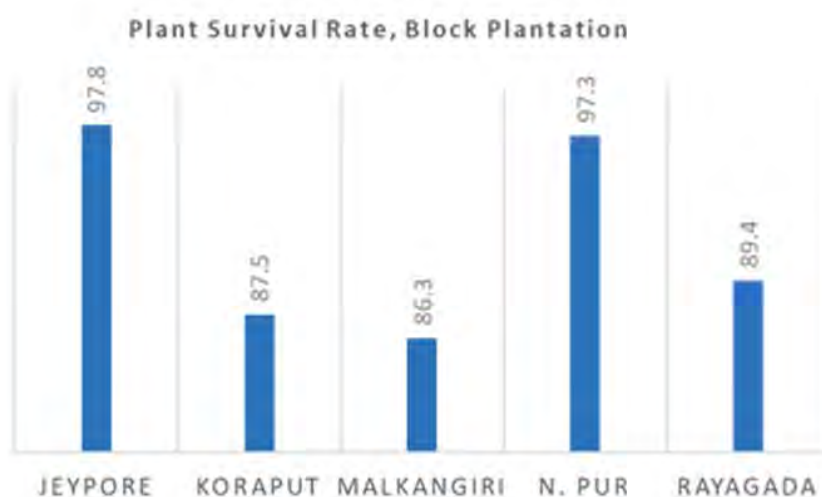


Figure 8:11: Plant Survival Rate in Block Plantations

### 8.7.2 Bald Hill Plantation:

Bald hill plantation observed in three forest divisions, i.e., Jeypore, Koraput and Rayagada. In bald hill plantation, average no. of plants per ha. enumerated to be 1,478 with highest average number of plants in Rayagada (1,555) and lowest in Koraput (1,410). The survival rate of the plants under these categories found to be lowest in Koraput (88.1 percent) and highest in Rayagada (97.19 percent).

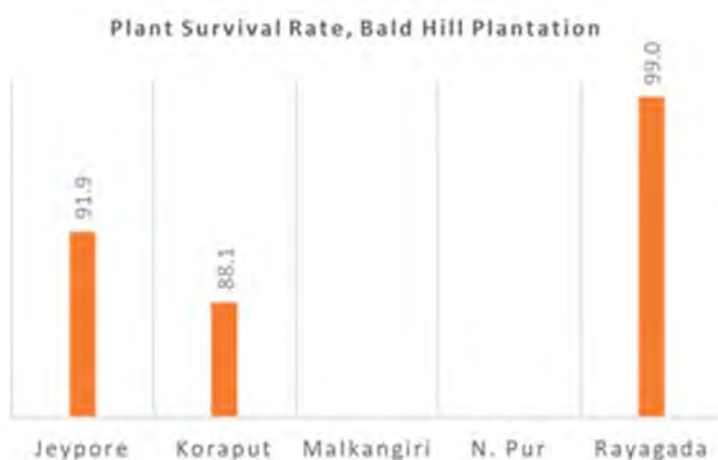


Figure 8:12: Plant Survival Rate in Bald Hill Plantation





### 8.7.3 ANR with Gap Plantation:

ANR with gap plantation (enrichment planting) is taken in a dual mode, i.e., dense plantation in block mode in identified patch of land and/or sparse / scattered plantation in the forest area. Plot specific plant count varies across plots and by forest division. As plantation mode has been of different nature, total plants planted and plants standing on the ground were taken in to account to estimate survival and mortality rate per ha. Average number of plants per ha. enumerated to be 175 with highest number of plants per ha. in Jeypore (187) and lowest in Koraput (155). Plant survival rate per ha. varies between 77.8 percent (Koraput) to 94.9 percent (Raygada).

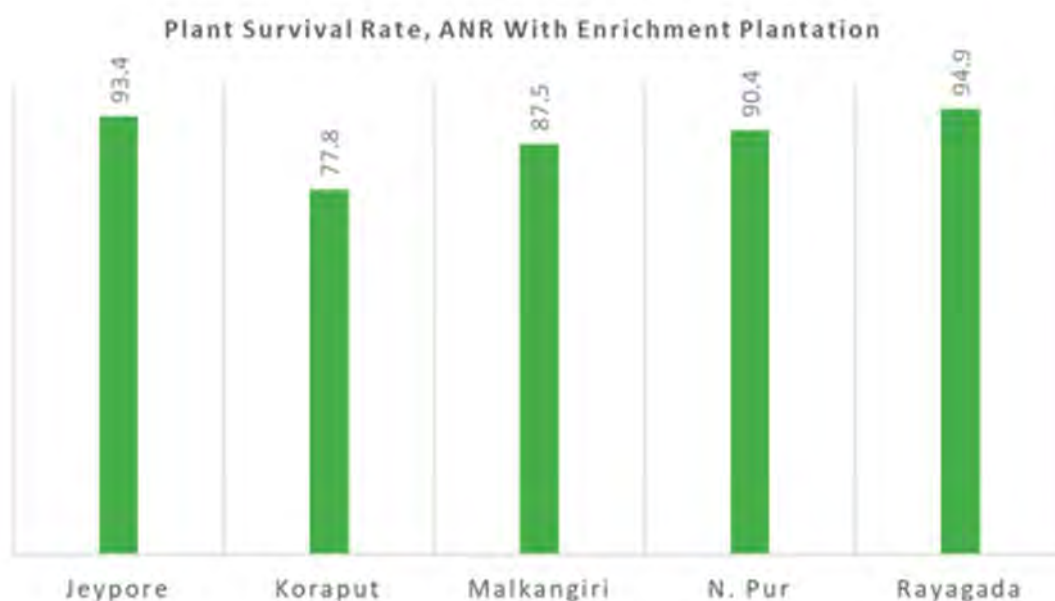


Figure 8:13: Plant Mortality Rate under ANR with Gap Plantation

Ranking of sites by plant survival reveals that at the circle level about 34.7 percent are in >95% survival category, 18.1% are in the >93 % & ≤95 % category followed by 9.7 % in >90 % to ≤93 % category. Aggregating different survival rate categories, it can be concluded that 93.1 percent sites have plant survival rate within 80.0 percent and 86.1 percent sites have plant survival rate within 85.0 percent. Circle and division wise ranking of plantation sites based on plant survival is presented in the table.

Table 8.2: Plant Survival by Plantation Categories

Plantation Types	Plant Survival Rank (% Distribution)									Total
	>95	>93<=95	>90<=93	>88<=90	>85<=88	>80<=85	>75<=80	>70<=75	<=70	
ANR with Gap	26.5	18.4	10.2	10.2	4.1	12.2	8.2	4.1	6.1	100.0
Bald Hill Plantation	40.0	20.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	100.0
Block Plantation	55.6	16.7	5.6	5.6	5.6	5.6	5.6	0.0	0.0	100.0
<b>Total</b>	<b>34.7</b>	<b>18.1</b>	<b>9.7</b>	<b>8.3</b>	<b>4.2</b>	<b>11.1</b>	<b>6.9</b>	<b>2.8</b>	<b>4.2</b>	<b>100.0</b>

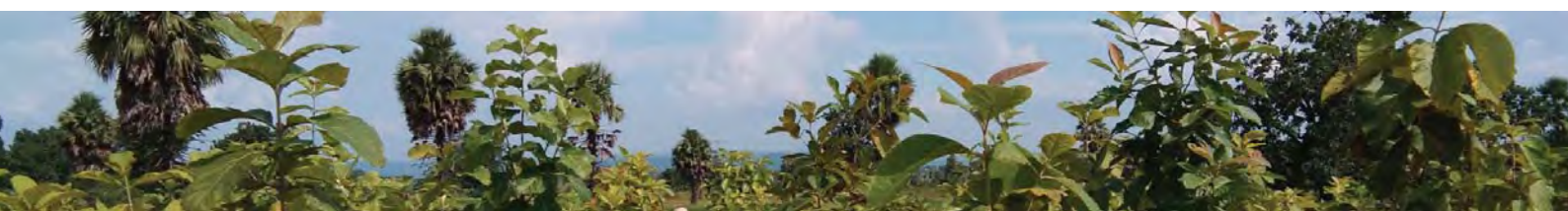


Table 8.3: Plant Survival by Plantation Categories &amp; Forest Divisions

Forest Divisions	Plant Survival Ranking (% Distribution)									Total
	<=5 %	>5 % &<=7 %	>7 % &<=10 %	>10 % &<=12 %	>12 % &<=15 %	>15 % &<=20 %	>20 % &<=25 %	>25 % &<=30 %	>30 %	
	>95	>93<=95	>90<=93	>88<=90	>85<=88	>80<=85	>75<=80	>70<=75	<=70	Total
Jeypore Division										
ANR with Gap	57.1	28.6					14.3			100.0
Bald Hill Plantation			100.0							100.0
Block Plantation	100.0									100.0
Total	60.0	20.0	10.0				10.0			100.0
Koraput Division										
ANR with Gap		18.2			9.1	36.4	9.1		27.3	100.0
Bald Hill Plantation		50.0				50.0				100.0
Block Plantation	33.3		33.3				33.3			100.0
Total	6.3	18.8	6.3		6.3	31.3	12.5		18.8	100.0
Malkangiri Division										
ANR with Gap	14.3	14.3	21.4	14.3	0.0	14.3	7.1	14.3		100.0
Block Plantation					50.0	50.0				100.0
Total	12.5	12.5	18.8	12.5	6.3	18.8	6.3	12.5		100.0
N. Pur Division										
ANR with Gap	14.3	28.6	0.0	28.6	14.3	0.0	14.3			100.0
Block Plantation	70.0	30.0								100.0
Total	47.1	29.4	0.0	11.8	5.9	0.0	5.9			100.0
Rayagada Division										
ANR with Gap	60.0	10.0	20.0	10.0						100.0
Bald Hill Plantation	100.0									100.0
Block Plantation				100.0						100.0
Total	61.5	7.7	15.4	15.4						100.0
Circle Total	34.7	18.1	9.7	8.3	4.2	11.1	6.9	2.8	4.2	100.0





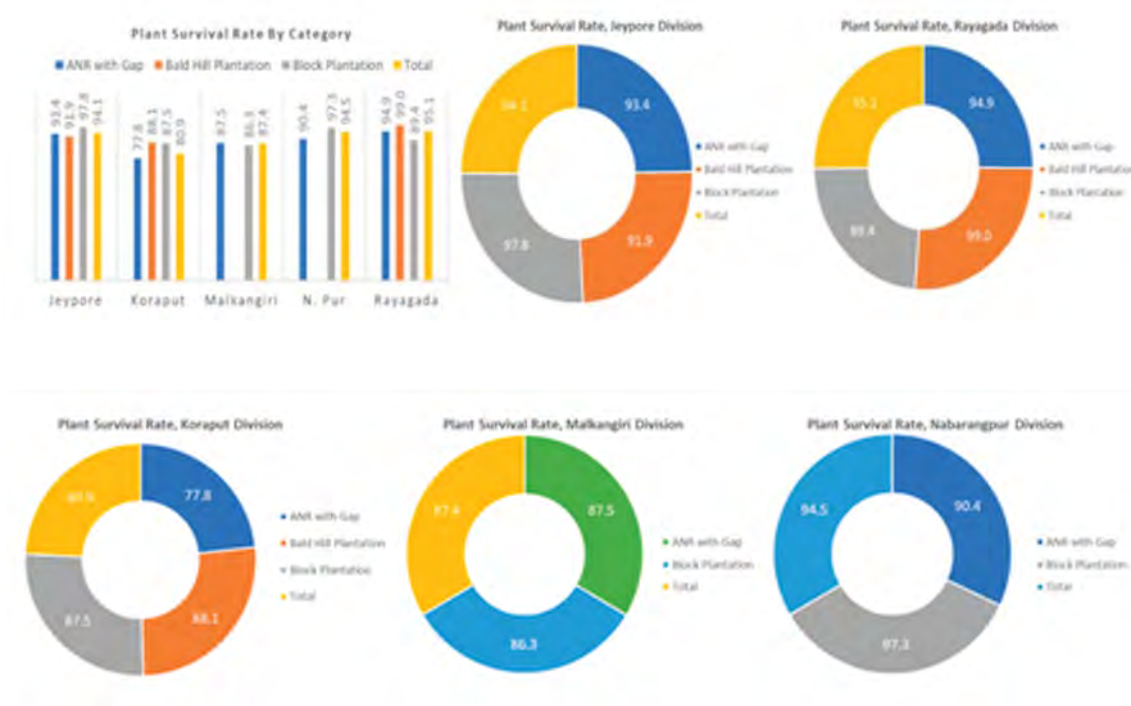


Figure 8.14: Plant Survival Rate by Plantation Type and Division Wise

## 8.8 Canopy Cover:

Canopy cover normally depends upon the age of the plant, species and crown density of the plants. It is observed in the assessment that the canopy cover varies by plantation types and year of plantation. As year of plantation varies along with plant species, canopy cover varies by site and by forest divisions.

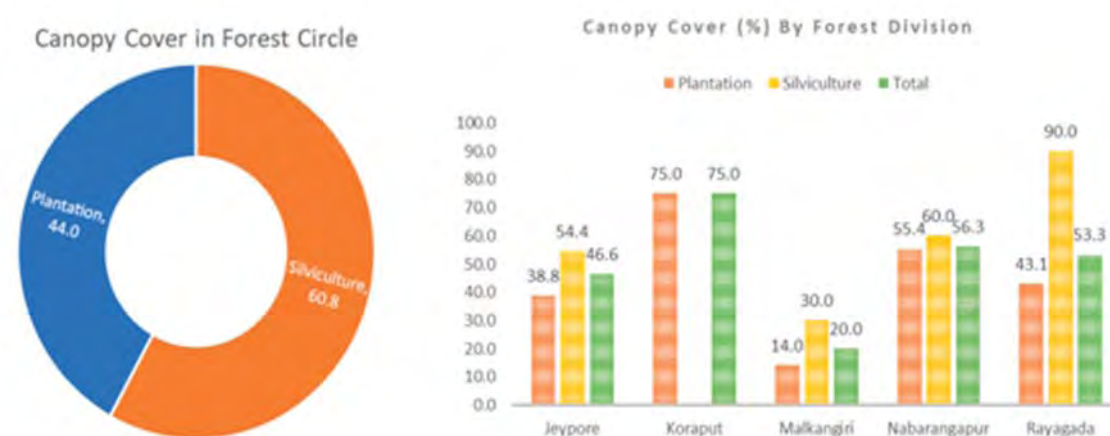
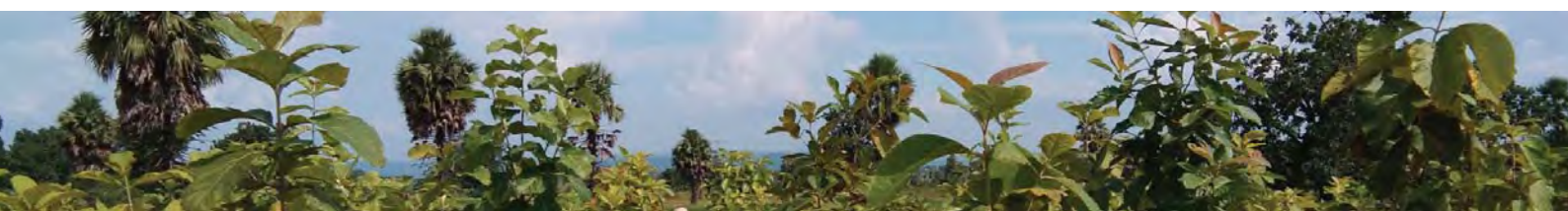


Figure 8.15: Canopy Cover in Forest Circle and Divisions

Canopy cover in bamboo plantation area is observed high among all the plantation categories (70.0 percent), followed by block plantation (58.2 percent) and bald hill plantation (57.5 percent). Among all the plantations, crown density observed low in case of ANR with gap plantation (27.4 percent) due to adoption of block plantation mode and absence of old trees. Sites covered under silvicultural operations in many sites have better canopy cover in comparison to plantation sites. Average canopy cover observed to be



highest in case of SSO timber (90.0 percent) followed by SSO Bamboo (60.0 percent). Canopy cover of plantation sites (by plantation category) and sites covered under silvicultural operational is presented below in figures and tables.

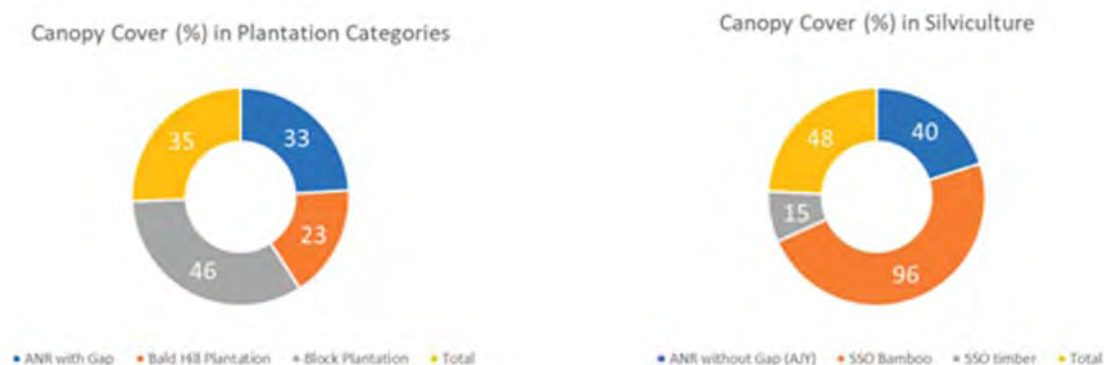


Figure 8.16: Canopy Cover in Plantation and Silviculture Categories

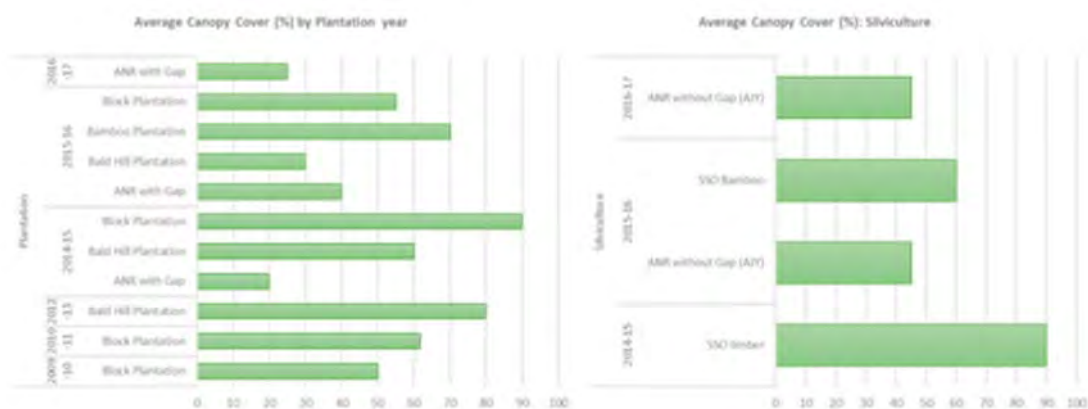


Figure 8.17: Canopy Cover by Plantation Year, Plantation Type and Silvicultural Operations

Irrespective of the years of plantation, highest of 19.6 percent sites have canopy cover of >20 & ≤30 percent and >30 & ≤40 percent. About 17.4 percent sites have canopy cover in the range of >50 & ≤60 percent and 13.0 percent sites are in the canopy cover range of >60 & ≤70 percent. Only 7.1 percent block plantation sites are in the canopy cover range of >80 percent. In case of sites having silvicultural operations, SSO timber is having the highest canopy cover and all sites fall in to >80 percent canopy cover range. SSO Bamboo sites having canopy cover in the range of >50 & ≤60 percent.

Table 8.4: Canopy Cover Ranking by Plantation & Silviculture

Categories	Canopy Cover (%) Ranking (% Distribution)									
	≤10	>10 & ≤20	>20 & ≤30	>30 & ≤40	>40 & ≤50	>50 & ≤60	>60 & ≤70	>70 & ≤80	>80	Total
Plantation										
ANR with Gap	13.0	26.1	34.8	26.1						100.0
Bald Hill Plantation			25.0			50.0		25.0		100.0
Bamboo Plantation							100.0			100.0





Categories	Canopy Cover (%) Ranking (% Distribution)									
	<=10	>10 & <=20	>20 & <=30	>30 & <=40	>40 & <=50	>50 & <=60	>60 & <=70	>70 & <=80	>80	Total
Block Plantation		7.1		21.4		42.9	7.1	14.3	7.1	100.0
Total	6.5	15.2	19.6	19.6		17.4	13.0	6.5	2.2	100.0
Silviculture										
ANR without Gap (AJY)			33.3		33.3	33.3				100.0
SSO Bamboo						100.0				100.0
SSO timber									100.0	100.0
<b>Total</b>			<b>15.8</b>		<b>15.8</b>	<b>42.1</b>			<b>26.3</b>	<b>100.0</b>

Table 8.5: Canopy Cover (%) by Forest Divisions and Plantation / Silviculture Categories

Forest Divisions	Canopy Cover Ranking (% Distribution)									
	<=10	>10 & <=20	>20 & <=30	>30 & <=40	>40 & <=50	>50 & <=60	>60 & <=70	>70 & <=80	>80	Total
Jeypore Division										
Plantation										
ANR with Gap				100.0						100.0
Bald Hill Plantation			100.0							100.0
Block Plantation				100.0						100.0
Total			12.5	87.5						100.0
Silviculture										
ANR without Gap (AJY)					100.0					100.0
SSO Bamboo						100.0				100.0
Total					37.5	62.5				100.0
Koraput Division										
Plantation										
Bald Hill Plantation								100.0		100.0
Block Plantation							100.0			100.0
Total							50.0	50.0		100.0
Malkangiri Division										
Plantation										



Forest Divisions	Canopy Cover Ranking (% Distribution)									
	<=10	>10 & <=20	>20 & <=30	>30 & <=40	>40 & <=50	>50 & <=60	>60 & <=70	>70 & <=80	>80	Total
ANR with Gap	75.0	25.0								100.0
Block Plantation		100.0								100.0
Total	60.0	40.0								100.0
Silviculture										
ANR without Gap (AJY)			100.0							100.0
Total			100.0							100.0
N. Pur Division										
Plantation										
ANR with Gap			100.0							100.0
Block Plantation				20.0		50.0		20.0	10.0	100.0
Total			23.1	15.4		38.5		15.4	7.7	100.0
Silviculture										
ANR without Gap (AJY)						100.0				100.0
Total						100.0				100.0
Rayagada Division										
Plantation										
ANR with Gap		50.0	50.0							100.0
Bald Hill Plantation						100.0				100.0
Bamboo Plantation							100.0			100.0
Block Plantation						100.0				100.0
Total		27.8	27.8			16.7	27.8			100.0
Silviculture										
SSO timber									100.0	100.0
Total									100.0	100.0

## 8.9 Display of Plantation Sites:

Pillars have been installed in different plantation sites and sites covered under silvicultural operations across the forest divisions in the circle. No. of pillars have been erected based on the plantation / silviculture area and shape of the plot. Area under silvicultural operations having higher number of pillars than the plantation sites (due to area coverage) in Jeypore. In rest of the cases, average number of pillars installed in plantation sites are more than silviculture operational sites. Mean and total pillars installed by plantation and silvicultural sites in different forest divisions are presented in the figure.





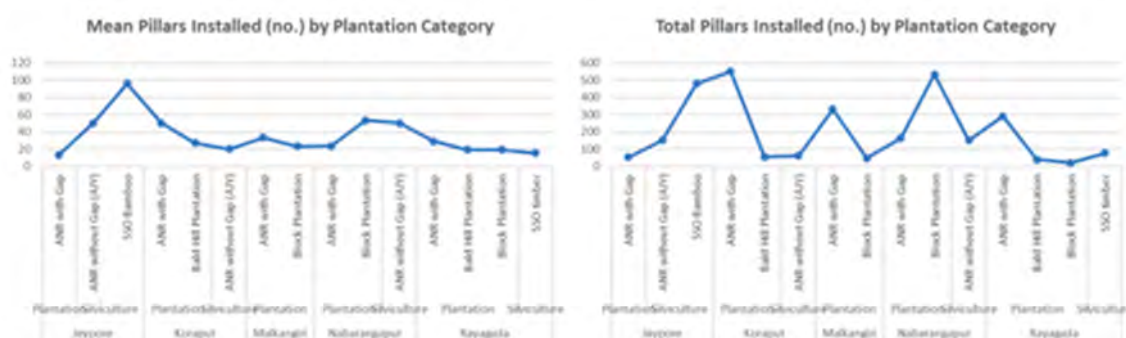


Figure 8:18: Installation of Pillars by Plantation Categories

## 8.10 Soil and Moisture Conservation (SMC) Measures:

Different soil moisture conservation measures have been taken under CAMPA in both plantation sites and area under silvicultural operations. Different SMC works have been taken up based on its locational suitability and assessed requirements. Different SMC activities taken up in plantation sites are staggered trench, half-moon trench, LBCD, check dam structure etc.

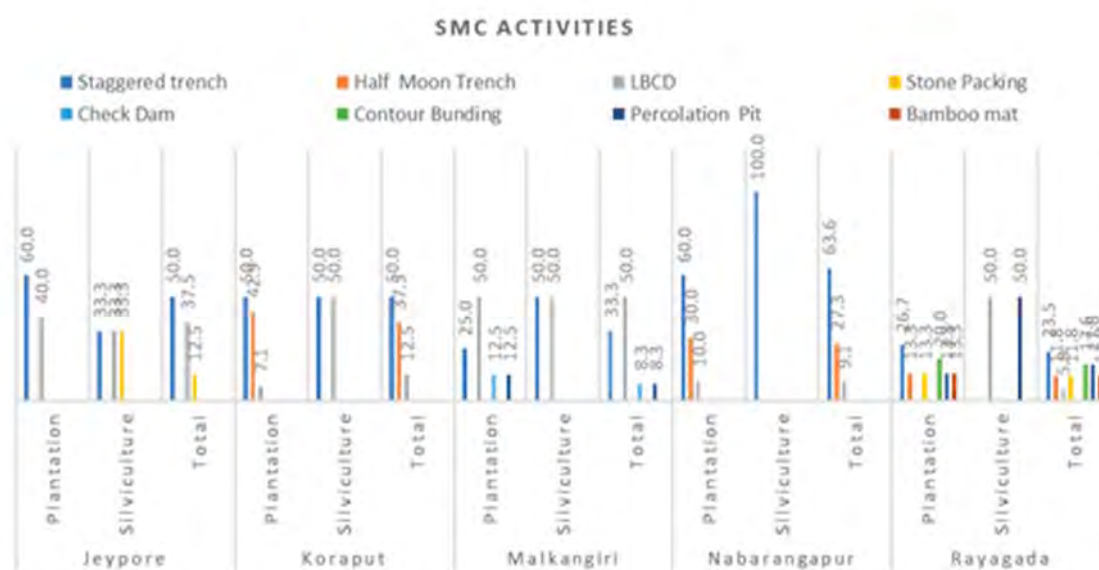
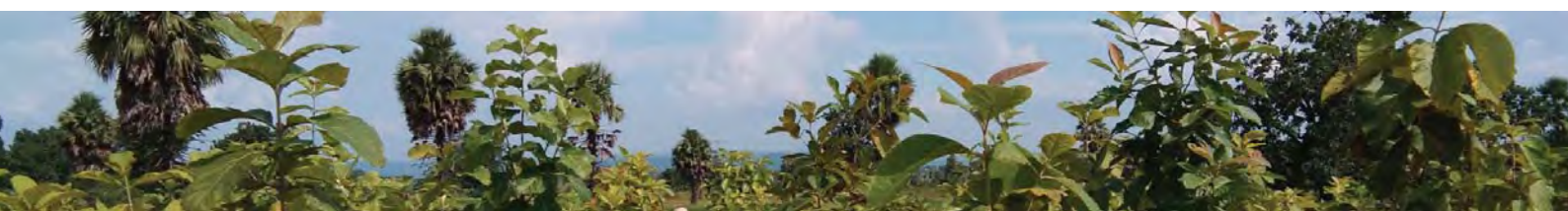


Figure 8:19: SMC Works in Forest Divisions (Source: Forest &amp; Environment Dept.)

Different SMC works have been taken up in plantation sites with emphasis on staggered trench, half-moon trench and LBCD structures. Contour bunding and percolation pits have also been taken up in some sites. In silvicultural operations, staggered trench and LBCD structures have been constructed in maximum sites along with stone packing and percolation pits in some sites. More than one SMC works have also been taken up in different plantation and silvicultural sites in the forest circle.



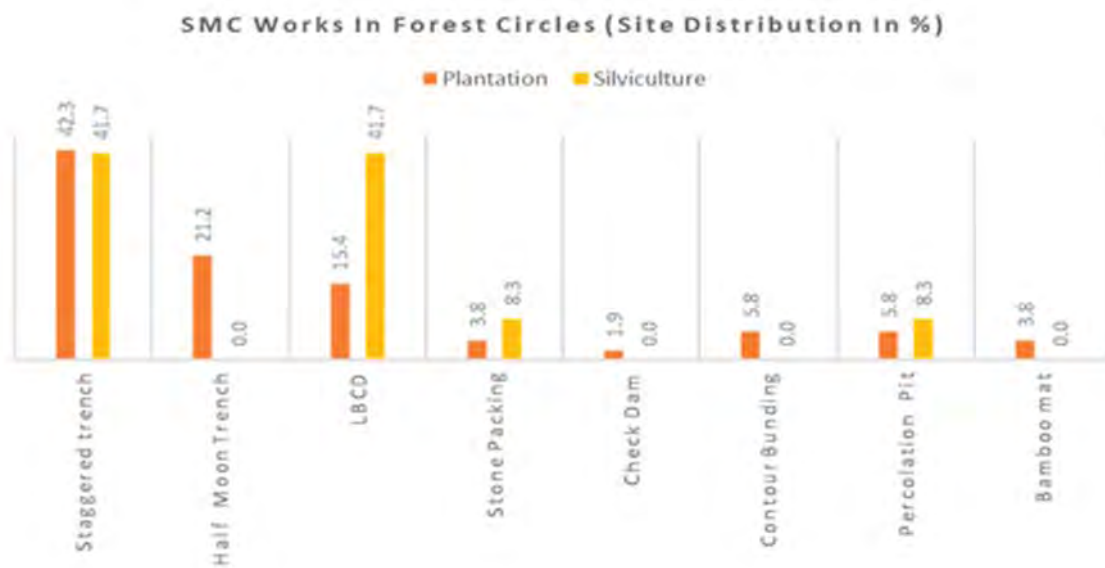


Figure 8:20: SMC Works by Forest Circle



Figure 8:21: SMC Activities in Forest Divisions





Table 8.6: SMC Structures in Plantation &amp; Silviculture Sites

Categories	SMC Structures							
	Staggered trench	Half Moon Trench	LBCD	Stone Packing	Check Dam	Contour Bunding	Percolation Pit	Bamboo mat
Plantation								
ANR with Gap	√	√	√		√	√	√	
Bald Hill Plantation	√	√	√			√	√	
Bamboo Plantation		√		√				√
Block Plantation	√	√	√					
Silviculture								
ANR without Gap (AJY)	√		√					
SSO Bamboo	√		√	√				
SSO timber			√				√	

Table 8.7: Single &amp; Multiple SMC Works in Plantation and Silviculture Site

Category	Specification	Multiple SMC Works		
		Single SMC Work	Two SMC Works	>2 SMC Works
Plantation	ANR with Gap	√	√	√
	Bald Hill Plantation		√	√
	Bamboo Plantation			√
	Block Plantation	√	√	
Silviculture	ANR without Gap (AJY)	√	√	
	SSO Bamboo	√	√	
	SSO timber		√	

## 8.11 Plant Height and GBH/GCH:

Height of the plants and girth of the plants of different species were measured to understand the growth factor. Growth of the plant by height and girth also represents the cultural practices and measures taken for ensuring appropriate nurturing of the plantation sites. The mean maximum height of the plants, irrespective of the year of plantation and plant species, calculated to be 7.06 mt. The mean minimum height of the plants at the circle level found to be 3.86 mt. for the plantation sites. Similarly, mean maximum GBH/GCH has been 25.73 cm and mean minimum GBH/GCH has been 13.05 cm.



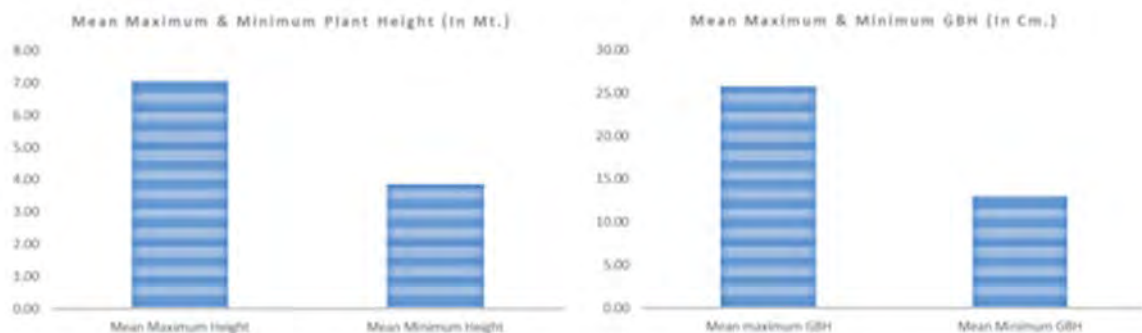


Figure 8:22: Height and GBH/GCH of Plants at Forest Circle Level

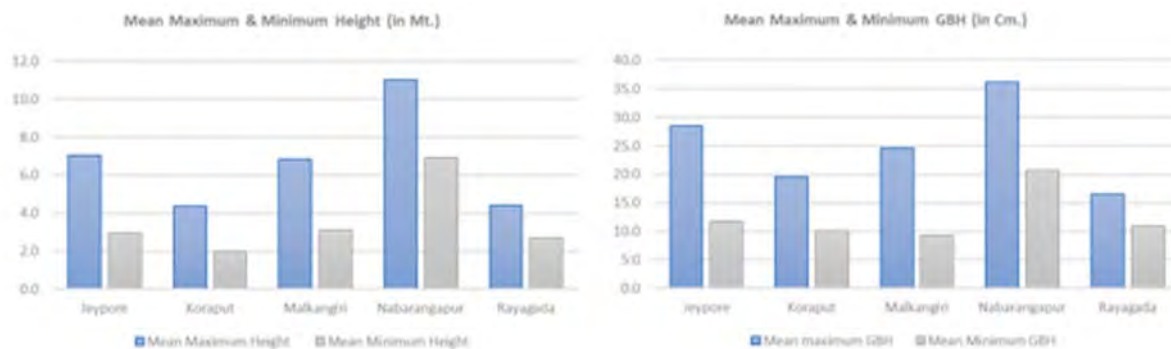


Figure 8:23: Height and GBH/GCH of Plants at Forest Division Level

Height and girth of the plants by forest divisions reflects that mean maximum height of the plants in plantation category is highest in Nabarangpur (11.0 mt.) followed by Jeypore (7.0 mt.) and lowest in Koraput (4.3 mt.). In mean minimum height, Nabarangpur is highest with 6.9 mt. and Koraput is lowest with 2.0 mt. Similarly, in case of mean maximum and mean minimum GBH/GCH, Nabarangpur is the highest among all the forest divisions. Details are presented and discussed below. The mean maximum and mean minimum height of the plants planted under different plantation works and its GBH/GCH is presented in the diagram.

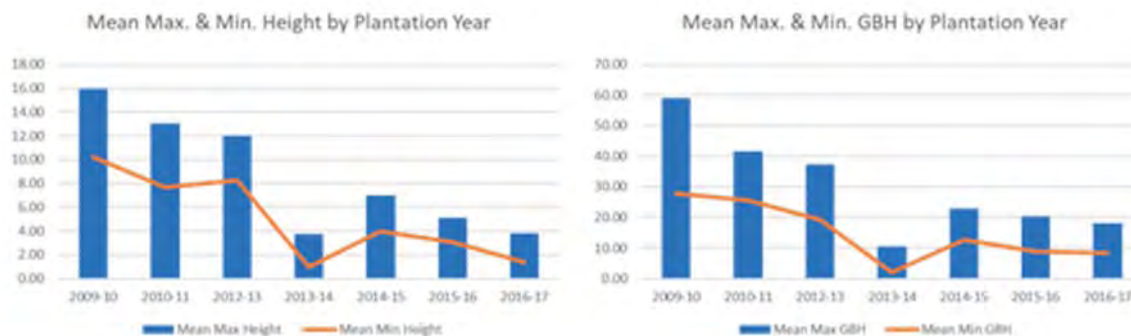


Figure 8:24: Year & Forest Division Wise Plant Height and GBH/GCH





Irrespective of the site and plant species, the plants that were planted in the year 2009-10, is having mean maximum height of 16.0 mt. and mean minimum height of 10.19 mt. The mean maximum and mean minimum GBH/GCH of the plants measured to be 59.02 cm. and 27.91 cm. respectively, which is highest among all other plantations taken up in successive years. As observed from field level plant measurements, there is increment in plant height and girth with years of plantation, i.e., plants have grown with each passed year. However, plantations taken up in 2013-14 in studied site reported retarded growth in comparison to plantations taken up in subsequent years, i.e., 2014-15 and afterwards.

Similar trend is observed across all the forest divisions in the Koraput forest circle which indicates that there has been focus on different plantation activities and attempt is made to ensure growth and survival of the plants through various activities like security measures, SMC works etc. The mean maximum and mean minimum height and GBH/GCH of different plant species is presented in the figures below with their year of plantation by forest division.





The mean maximum height per year and mean minimum height per year by plant species varies based on factors like climatic conditions, land suitability, soil types etc. Irrespective of the plant species, mean maximum height per year of the plants found to be 1.37 mt. and mean minimum height of the plants per year observed to be 0.69 mt. Highest of mean maximum height among the plants found to be in Acacia, Acacia Mangium and Maha Neem. Lowest mean maximum height observed in case of Jamun, Sisoo and Bada Chakunda.





Similarly, mean maximum GBH/GCH of the plants per year, irrespective of the plant types, observed to be 5.23 cm. and mean minimum GBH/GCH of the plants per year calculated to be 2.59 cm. Highest mean maximum GBH/GCH per year found to be in Simaruba and lowest mean maximum GBH/GCH per year found to be in Bada Chakunda. Highest mean minimum GBH/GCH among the plants found to be in Gambhari and lowest in plants like Mahogany, Sisoo and Jamun.

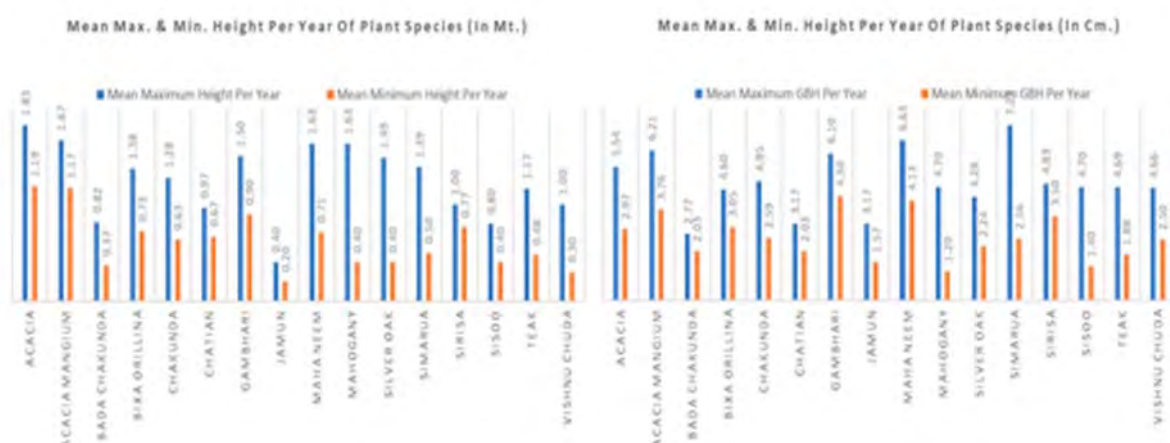


Figure 8.27: Per Year Mean Maximum & Minimum Growth in Height and GBH/GCH

Plants by year of plantation and related height (mt.) ranks is presented in the table. Some plants have substantial growth based on year of plantation in different divisions like Asana, Char, Sal and Sisoo. Plants like Teak also reflects good growth in different sites. Ranking of plants by its height and plantation category is presented in the table below.

Table 8.8: Ranking of Mean Maximum Plant Height by Plantation Types

Year	Plantation Types	Rank of Mean Maximum Height (in Mt.) of Plants in Sites (% Distribution)									
		R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9	Total
		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14	>14 & <=17	>17 & <=20	>20 & <=25	>25	
2009-10	Block Plantation				33.3	16.7	16.7	5.6	22.2	5.6	100.0
2010-11	Block Plantation				34.8	17.4	43.5	4.3			100.0
2012-13	Bald Hill Plantation				50.0	25.0	25.0				100.0
2013-14	ANR with Gap		100.0								100.0
2014-15	ANR with Gap	9.9	35.2	22.5	18.3	12.7	1.4				100.0
	Bald Hill Plantation		14.3	42.9	14.3	28.6					100.0
	Block Plantation		25.0		25.0			50.0			100.0
2015-16	ANR with Gap	18.2		27.3	54.5						100.0



Year	Plantation Types	Rank of Mean Maximum Height (in Mt.) of Plants in Sites (% Distribution)									
		R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9	Total
		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14	>14 & <=17	>17 & <=20	>20 & <=25	>25	
	Bald Hill Plantation		100								100.0
	Bamboo Plantation	100.0									100.0
	Block Plantation	42.9	57.1								100.0
2016-17	ANR with Gap	25.3	53.2	16.5	5.1						100.0
	Bald Hill Plantation	50.0		50.0							100.0

Table 8.9: Ranking of Mean Minimum Plant Height by Plantation Types

Year	Plantation Types	Rank of Mean Minimum Height (in Mt.) of Plants in Sites (% Distribution)								
		R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	Total
		<=2	>2 &<=5	>5 &<=8	>8 &<=11	>11 &<=14	>14 &<=17	>17 &<=20	>20 &<=25	
2009-10	Block Plantation	16.7	22.2	16.7	11.1			27.8	5.6	100.0
2010-11	Block Plantation	21.7		26.1	34.8	17.4				100.0
2012-13	Bald Hill Plantation		25.0	25.0	50.0					100.0
2013-14	ANR with Gap	100.0								100.0
2014-15	ANR with Gap	38.0	33.8	22.5	5.6					100.0
	Bald Hill Plantation	42.9	28.6	28.6						100.0
	Block Plantation		25.0	25.0		25.0	25.0			100.0
2015-16	ANR with Gap	54.5	36.4	9.1						100.0
	Bald Hill Plantation	75.0	25.0							100.0
	Bamboo Plantation	100.0								100.0
	Block Plantation	85.7							14.3	100.0
2016-17	ANR with Gap	84.8	15.2							100.0
	Bald Hill Plantation	100.0								100.0





Table 8.10: Ranking of Mean Maximum GBH/GCH of Plants by Plantation Types

Year	Plantation Types	Ranking of Mean Max. GBH/GCH (in Cm.) of Plants in Sites (% Distribution)								
		R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	Total
		<5	>5 &≤10	>10 &≤20	>20 &≤30	>30 &≤45	>45 &≤60	>60 &≤80	>80 &≤100	
2009-10	Block Plantation	16.7	22.2	16.7	11.1			27.8	5.6	100.0
2010-11	Block Plantation	21.7		26.1	34.8	17.4				100.0
2012-13	Bald Hill Plantation		25.0	25.0	50.0					100.0
2013-14	ANR with Gap	100.0								100.0
2014-15	ANR with Gap	38.0	33.8	22.5	5.6					100.0
	Bald Hill Plantation	42.9	28.6	28.6						100.0
	Block Plantation		25.0	25.0		25.0	25.0			100.0
2015-16	ANR with Gap	54.5	36.4	9.1						100.0
	Bald Hill Plantation	75.0	25.0							100.0
	Bamboo Plantation	100.0								100.0
	Block Plantation	85.7							14.3	100.0
2016-17	ANR with Gap	84.8	15.2							100.0
	Bald Hill Plantation	100.0								100.0

Table 8.11: Ranking of Mean Minimum GBH/GCH of Plants by Plantation Types

Year	Plantation Types	Ranking of Mean Min. GBH/GCH (in Cm.) of Plants in Sites (% Distribution)									
		R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9	Total
		<5	>5 &≤10	>10 &≤20	>20 &≤30	>30 &≤45	>45 &≤60	>60 &≤80	>80 &≤100	>100	
2009-10	Block Plantation	11.1	5.6	11.1	22.2	38.9	11.1	0.0	0.0	0.0	100.0
2010-11	Block Plantation		4.3	13.0	39.1	21.7	0.0	0.0	0.0	21.7	100.0
2012-13	Bald Hill Plantation		25.0	25.0	50.0	0.0	0.0	0.0	0.0	0.0	100.0
2013-14	ANR with Gap	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
2014-15	ANR with Gap	11.3	42.3	29.6	16.9	0.0	0.0	0.0	0.0	0.0	100.0
	Bald Hill Plantation		0.0	71.4	14.3	14.3	0.0	0.0	0.0	0.0	100.0



Year	Plantation Types	Ranking of Mean Min. GBH/GCH (in Cm.) of Plants in Sites (% Distribution)									
		R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9	Total
		<5	>5 &≤10	>10 &≤20	>20 &≤30	>30 &≤45	>45 &≤60	>60 &≤80	>80 &≤100	>100	
	Block Plantation		0.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0	100.0
2015-16	ANR with Gap	36.4	18.2	36.4	9.1	0.0	0.0	0.0	0.0	0.0	100.0
	Bald Hill Plantation		75.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Bamboo Plantation	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Block Plantation	14.3	57.1	28.6	0.0	0.0	0.0	0.0	0.0	0.0	100.0
2016-17	ANR with Gap	15.2	59.5	22.8	2.5	0.0	0.0	0.0	0.0	0.0	100.0
	Bald Hill Plantation		100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0

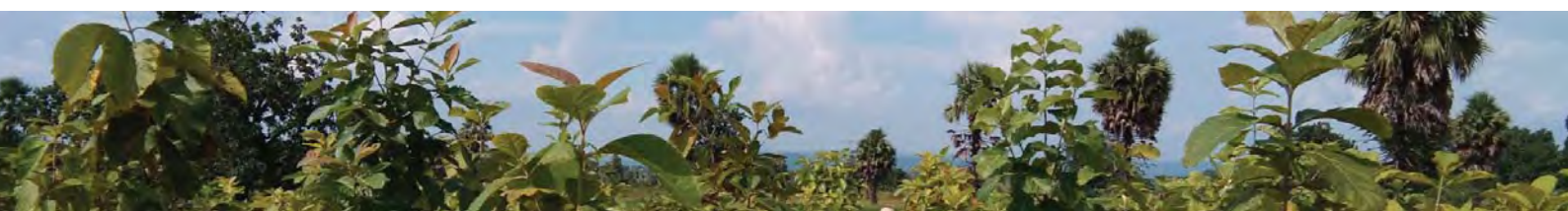
## 8.12 Plant Protection Measures:

Different plant protection measures have been taken in all the forest divisions to improve plant survival rate. Plant protection measures taken are like fencing, fire protection measures, watch and ward etc. In certain cases, villages and VSS have been found taking care of the local forest area and plantation sites. At the circle level, covering all the forest divisions, it is found that high emphasis is given to watch and ward (64.0 percent sites) among all the protection measures, irrespective of the year of plantation. Fire protection measures (22.0 percent sites) are taken wherever applicable. Fencing is minimal among all the protection measures taken. Very limited sites (4.0 percent) also do not have any protection measures in the plantation sites.

## 8.13 Record Keeping and Documentation:

Different records / documents are maintained at the range office level with respect to plantation / silvicultural activities, such as plantation journal, plantation site map, treatment map and other registers. Plantation journal is observed for 90.3 percent plantation sites and journal for silvicultural operation is found for 57.1 percent sites covered under silvicultural operations. Journal for plantation activities found for all the sites in case of Koraput forest division, Malkangiri forest division and Nabarangpur forest division. For silvicultural operations, journal found for all the sites in Koraput and Nabarangpur. Map of all the plantation sites found in Koraput, Malkangiri and Nabarangpur. Similarly, map of all the sites covered under silvicultural operations found in Jeypore, Koraput, Nabarangpur and Rayagada. At the forest circle level, map for plantation sites observed for 87.1 percent sites and 85.7 percent silvicultural operation sites.

Micro plan is found not prepared in all the forest divisions for most of the sites which includes plantation and/or silvicultural operations. Whereas, treatment map observed for 32.3 percent plantation sites and 28.6 percent sites covered under silvicultural operations. In Nabarangpur, all the plantation sites and sites covered under silvicultural operations have treatment map while in Koraput, all the sites covered under silvicultural operations have treatment map. Details are presented in the diagram.





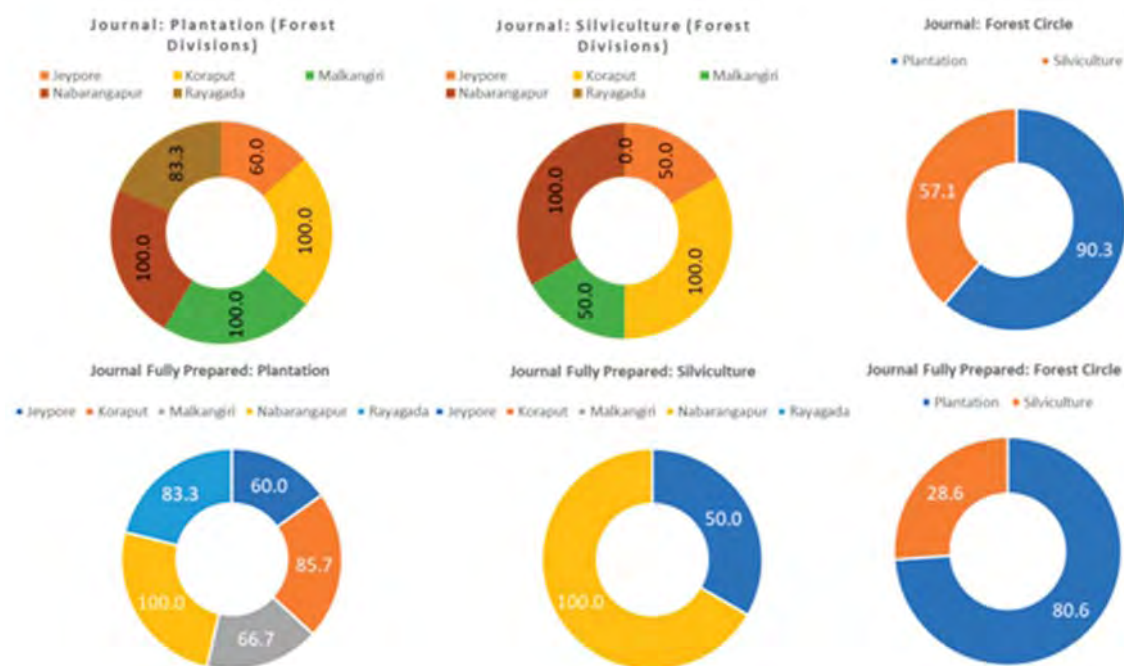


Figure 8:28: Plantation Journal



Figure 8:29: Map of Plantation Sites



Figure 8:30: Micro Planning





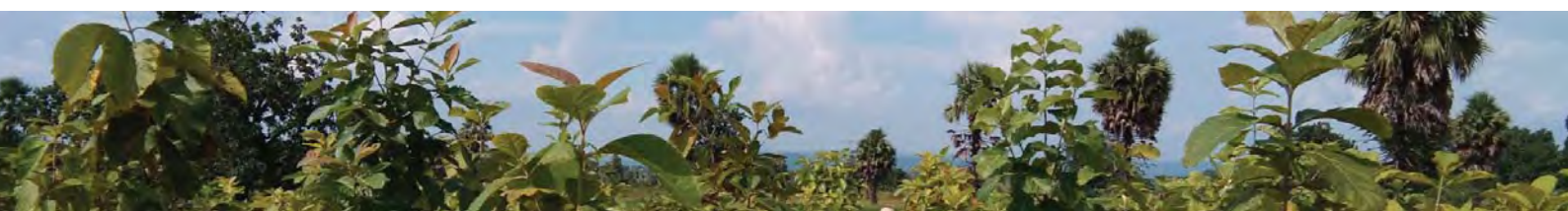
Figure 8:31: Treatment Map

## 8.14 Ama Jungle Yojna

Out of 5 forest divisions in Koraput circle, AJY is promoted under CAMPA in all five forest divisions. Basing on the information obtained from all five sample AJYs, it is found that all the functioning VSSs involved in AJY are adhering CAMPA guidelines in their day to day operations. There are pre planning before undertaking plantation activities. The VSS members were found involved in various stages of activities. They maintain good relationship with forest department officials.

Table 8.12: VSSs involvement in CAMPA Activities

Sl. No.	Name of the VSS/ Division/ Range/ Section / Beat/ Village	Following CAMPA Guidelines	Pre planning	Involvement in various stages	Project planning	Adhering to Project Implementation	Good relationship and cooperation
1	Ghodakhunta VSS Nabarangpur/ Umarkote/ Singisani/ Godakhunta / Ghodakunta	Yes	Yes	Yes	Yes	Yes	Yes
2	Simagudi VSS Malkanagiri/ Malkanagiri / Malkanagiri / Champakhari/ Simagudi	Yes	Yes	Yes	Yes	Yes	Yes
3	Pradhaniput Koraput/ Balda/ Padua /Dadiput / Pradhaniput	Yes	Yes	Yes	Yes	Yes	Yes
4	Jodaput Jeypur/ Boriguma/ Boriguma/ Boriguma/ Jodaput	Yes	Yes	Yes	Yes	Yes	Yes





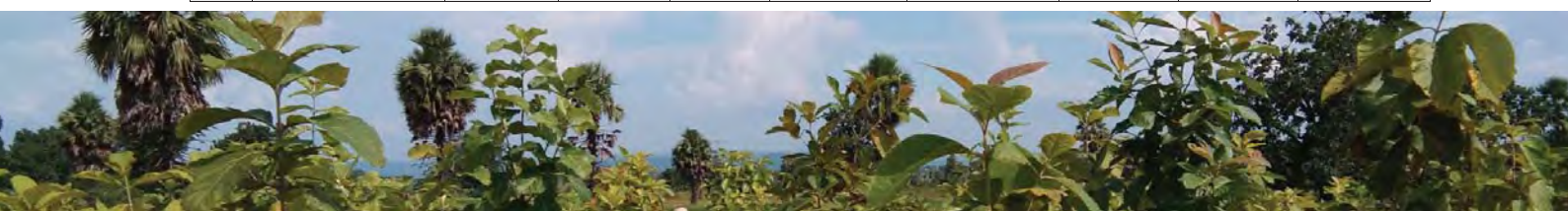
Sl. No.	Name of the VSS/ Division/ Range/ Section / Beat/ Village	Following CAMPA Guidelines	Pre planning	Involvement in various stages	Project planning	Adhering to Project Implementation	Good relationship and cooperation
5	Chinariguda VSS Rayagada/ Gunupur/ Gunupur/ Chinariguda/ Chinariguda	Yes	Yes	Yes	Yes	Yes	Yes

#### 8.14.1 Practices followed

It was found that the VSSs are regularly conducting meetings and attendance rate in the meetings is found good. Records and registers are properly maintained. The wage payment for the labourers is made in cash and on daily basis.

Table 8.13: Type of Major Practices followed by the VSSs

Sl.	Name of the VSS/ Division/ Range/ Section / Beat/ Village	Frequency of JFA meeting	Attendance rate in meeting	Held of awareness prog	Traind of forest coverage/ plantation	Maintenance of VSS Register	Wage payment system	Mode of payment	Training prog. Organised in your area
1	Ghodakhunta VSS Nabarangpur/ Umarkote/ Singisani/ Godakhunta / Ghodakunta	Always	Good	No	Improved	Properly maintained	Daily	Cash	Yes
2	Simagudi VSS Malkanagiri/ Malkanagiri / Malkanagiri / Champakhari/ Simagudi	Always	Good	No	Improved	Properly maintained	Weekly	Cash	Yes
3	Pradhaniput Koraput/ Balda/ Padua /Dadiput /Pradhaniput	Always	Good	yes	Improved	Properly maintained	Daily	Cash	No
4	Jodaput Jeypur/ Boriguma/ Boriguma/ Boriguma/ Jodaput	Always	Good	yes	Improved	Properly maintained	Daily	Cash	No
5	Chinariguda VSS Rayagada/ Gunupur/ Gunupur/ Chinariguda/ Chinariguda	Always	Average	No	Improved	Partly Maintained	Daily	Cash	No



### 8.14.2 Impacts of CAMPA

Due to CAMPA support, status of plantation is found to be improved in all the VSS areas, and frequency of forest fire incidences is rarely witnessed, there is no Podu cultivation which was practiced by the villagers previously. Frequency human animal conflict is rarely reported. Due to CAMPA supported plantation and SMC works, water level in forest fringe villages tended to increase.

*Table 8.14: Type of major impacts of CAMPA led AJY*

Sl.	Name of the VSS/ Division/ Range/ Section / Beat/ Village	Mode of protection of plantation	Frequency of fire incident	Practice of Podu cultivation	wild animal visit	Mitigation plan for human animal conflict	Frequency the human Animal conflict	Change of water level after plantation under CAMP
1	Ghodakhunta VSS Nabarangpur/ Umarkote/ Singisani/ Godakhunta / Ghodakunta	Villagers	Never	No	Yes	No	Never	Increased
2	Simagudi VSS Malkanagiri/ Malkanagiri / Malkanagiri / Champakhari/ Simagudi	Labour	Rarely	No	No	No	Never	Increased
3	Pradhaniput Koraput/ Balda/ Padua /Dadiput /Pradhaniput	Labour	Never	No	Yes	No	Rarely	Increased
4	Jodaput Jeypur/ Boriguma/ Boriguma/ Boriguma/ Jodaput	Labour	Never	No	Yes	No	Rarely	Increased
5	Chinariguda VSS Rayagada/ Gunupur/ Gunupur/ Chinariguda/ Chinariguda	Labour	Never	No	No	No	Never	Increased





## 8.15 Assessment Observations:

Table 8.15: Jeypore Forest Division

Type of Assets	Observations
Block Plantation/ Baipariguda/ Dusmantapur/ Dusmantapur	Plantation is done in the hill side which is prone to forest fire incidences. The area is prone to farming despite of heavy supervision from the forest department. A/ttempt is being made to develop a barren land to a green cover through plantation. Cutting of plants by the locals is also reported and now attempt is made to grow the coppices. Many Natural species have started growing in the area.
SSO Bamboo/Jaipur/ Balhigaam/Cheraka	The site observed impacted from illegal cutting for commercial and/or local consumption. Even some clumps have no bamboo; There were many low-grade bamboos which have low growth. Even people were cutting 1st year bamboos for different uses.
ANR without Gap (AJY)/ Bariguma/Bariguma/ Bariguma	Before CAMPA intervention, Teak was planted. Species like Kendu, Sal, Bamboo were naturally present in the site. SMC and boundary clearance works have been done on higher heights.
Bald Hill Plantation/ Bariguma/Katharagada/ Katharagada	The fencing was damaged and therefore trees near the road were not fully grown. Planted trees used as fodder by the local cattle. Trees up the hill and away from road found well grown in comparison to road side trees.
ANR with Gap/ Baipariguda/Matpada/ Doroguda	This sit has been protected by local people and control the illegal cutting. Natural regeneration species also dominated to plantation
ANR with Gap/Jaipur/ Patraput/Patrapu	The site is having medicinal plantations. Regeneration of indigenous species is observed along with new plantations; A trench is being constructed at simaruba.
ANR with Gap/Boriguma/ Katharagada	The site is on the hill and near to the agricultural field. Naturally grown trees found in the site like Kendu, Sal, Simli, Mango, Bija, Mahua.



Table 8.16: Koraput Forest Division

Type of Assets	Observations
<b>Bald Hill Plantation Koraput/Koraput/Mangra</b>	<p>The Bald Hill Plantation found to be successful in this site.</p> <p>The site was completely degraded before CAMPA operation and now coming back to greenery.</p> <p>Tree species observed are like Amla, Kendu, Kurai, Sal, Sahaja and Jamun are naturally regenerated species.</p> <p>The villagers have been very supportive and they protect the forest from being cut or damaged.</p> <p>Regular consultation of local forest department officials with villagers were held before and during plantation.</p> <p>Green fencing with bamboo, chillar, agave and lantana is done.</p> <p>Fireline is also created for plant protection.</p> <p>Cleaning of the site is also done up to 4th year of plantation.</p> <p>NTFP like sal seeds, amla, curry leaves are collected by the local villagers without affecting the trees.</p>
<b>Bald Hill Plantation / Similiguda/Similiguda / Kunduli</b>	<p>Trees were in sapling stage, planted with 2.5*2.5m spacing.</p> <p>Green fencing with bamboo and wood fencing is done for protection.</p> <p>Plant species like Mango, Jamun, Jackfruit and Kendu which can be used by the villagers started growing.</p> <p>It was a barren hill before CAMPA intervention which is now emerging as a greenery patch.</p> <p>Plant casualties observed due to the white ant attack.</p> <p>Villagers collect Mango, Jamun, fuelwood from the forest after the forest is regenerated due to CAMPA intervention.</p>
<b>Block Plantation / Similiguda/Similiguda / Pitaguda</b>	<p>It is an old plantation site on a hilly and rocky area.</p> <p>Species like Chakunda has grown relatively well in the site.</p> <p>The villagers are protecting and maintaining the forest.</p> <p>Villagers involvement in forest protection caused forest growth and its improvement possible.</p>
<b>Block Plantation /Koraput/ Podagada/Janiguda</b>	<p>Plantation is done on a hill with spacing of 2.5m*2.5m..</p> <p>The site is rocky for which growth of trees is comparatively less.</p> <p>Tree species found in the site and grown are like Teak, Ghambhari, Sana Chakunda, Acacia, Karanjia, Amla, Simaruba, Balua.</p>
<b>ANR with gap Similiguda/Nandapur/ Nandapur</b>	<p>Plantation is done in 2 patches in the site.</p> <p>A new recreational site is being prepared near the plantation site. People come to spend time in the evening and enjoy the nature.</p> <p>Trees found are like Mango, Jamun, Sandal, Asana, Kendu, Kari, Sunari, Karanjia, Jackfruit, Kusum etc. were grown.</p> <p>Local villagers collect NTFP along with Mango, jackfruit etc.</p>



Type of Assets	Observations
<b>ANR with gap / Koraput/Podaguda/Janiguda</b>	The site selected for ANR-GP was a degraded forest area. It is a well-maintained forest done on a hilly area. Tree species found in the site are like Kusum, Kurai, Kumbhi, Sahaja, Chera, Mango, Jamun, Sinduramundi, Karanjia, Mahua etc. Regeneration of indigenous species observed in the site. Community use Simaruba seeds for oil. Mango and banana are also grown for local and commercial use. People also collect curry leaves from this forest patch along with other forest produces.
<b>ANR with gap/ Balda/Padhua/Undrgoda</b>	The site is located besides the road (road side). Good growth of silver oak observed in the site but jamun hasn't grown well enough. Trees observed are like Chara, Jamun, Mankada Kendu, Simili, Kurai.
<b>ANR without Gap (AJY) Balda/Padhua/Darliput</b>	The area taken up for rejuvenation was a barren land and rocky topography. It is an open patch with very low vegetation. It was previously used as agricultural field but after the formation of VSS, the forest land was recovered and converted to plantation site. Tree species observed in the site are like Mahula, jackfruit, curry leaf, siali, sahaja, jamun, simaruba, kendu, karanj, bahada, tamarind, sirisa etc. Trees are not yet grown fully in this forest patch.

Table 8.17: Malkangiri Forest Division

Type of Assets	Observations
<b>ANR with Gap Mathili/ Mathili/ Godiali</b>	The ANR-GP is done in a suitable patch in the roadside. The site is having indigenous species like Mahua, Asana, Sahaj, Kusum, Kurua, Bela, Palasa and Banyan trees. Use of the site for cattle grazing is observed which may have impact on plantation.
<b>ANR with Gap Mathili/ Mathili/ Chedinga</b>	Before plantation, the site was encroached by the locals for different uses and later the area was taken back for plantation. The ANR-GP is done in a suitable patch in the roadside. The site is having indigenous species like Mahula, Asana, Sahaj, Kusum, Kurua, Bela, Palasa, Banyan trees etc. Use of the site for cattle grazing is observed which may have impact on plantation. Involvement of villagers in the plantation activity is observed.
<b>ANR with Gap/ Mathili/Pangam/ Pangam</b>	The plantation site is located beside the road (Roadside plantation). Vegetation in the site is sparse, plantation is done in recent years for which growth of the plant is limited. Indigenous species observed are like Mahula, Siddha, Palaso, Kendu, Kusuma, Sal etc. Plantation is done in a block plantation mode within the spacing of 2.5 m. The site is having a percolation pit, as a part of SMC measure, having dimension of 0.9*0.9*0.3. Villagers collect fuel wood and different NTFP, based on its availability from the forest.





Type of Assets	Observations
Block Plantation - Mutam Konda RF/ Balimela/ Balimela/Nilakamberu	Under block plantation, about 4,200 seedlings were planted. The site has no proper fencing and therefore goats/cattle easily come to graze on the bamboo shoots which is affecting bamboo regeneration. The site has Kanta bamboo species. Fire incidences is common in the interior patches of forest. Firewood collection by villagers is a common sight. Villagers also venture in to the forest site for the collection of fuel wood and Mahua flower.
SSO Bamboo/ Balimela/Somnathpur /Somnathpur	The site is located near the hill and the side is dry and arid. Occurrence of fire incidences in this area, mostly in Feb-April is common. The site is having Kanta bamboo species. Local villagers collect and use bamboo for household purpose (fencing, house construction). Villagers collect Mahua flower in the season from this forest.
ANR with Gap/ Malkangiri/ Padmagiri/Akur	The site was an encroached and cultivated forest land which was again converted back and used for plantation. The forest is having indigenous tree species like Kendu, Tamarind and Mahula. It is observed that the local villagers are involved in the plantation and management activities.
ANR with Gap (AJY)/ Malkangir /Malkangiri/ Champakhari	After maintenance activities taken up, new trees started growing in the site. Indigenous species observed like Mahula, Chara, koli, Kurai, Mahaneem, Dhaura, Bana Bhalia. Local villagers are helpful and supportive in forest protection.
Block Plantation /Malkanagiri/ Padamgiri/Akur	The site was an encroached forest land, which was used for agricultural purpose by the locals. Later the land was recovered and used for plantation activities. The villagers took a strong initiative in making it a forest and now they are also supporting in the protection work.

Table 8.18: Observations: Nabarangpur Forest Division

Type of Assets	Observations
Block plantation/ Dabugaon/Dabugaon/ Koilari	The plantation site is plain and the plantation has been done inside an existing natural forest. So huge Sal trees observed in the plantation site. Well maintained and road side cultivation. However, growth of the newly planted trees seems less due to the shade of the large trees around.
Block plantation / Dabugaon/Dabugaon/ Sulia	It was a well grown patch (another site) with heavy canopy cover of about 80-90%. Trees like Acacia and Chakunda had bifurcation at the base (3-4). Well maintained and clean plantation site. As the trees have grown up, it is used for animal grazing which may be the reason for no shrubs in the site. Sign board found damaged. Earlier it was a forest land which was later encroached and converted to agricultural field by the locals. But now due to VSS involvement it is recovered and converted to a plantation site.



Type of Assets	Observations
Block plantation / Nawarangpur/ Tumbarla/Tumbarla	<p>Plantation in the 35 ha. is done in block mode in 7 different patches. Plantation site is well maintained.</p> <p>The land was previously encroached by the locals and used as an agricultural land. But due to community support and involvement and efforts of forest department it is converted to a good forest through AR plantation.</p> <p>No indigenous species present.</p> <p>Villagers protect the plantation site voluntarily.</p>
Block plantati Umarkot/ Dhora/Karagaon	<p>Plantation is done in 3 different patches in the site.</p> <p>Sign board in the plantation site found damaged.</p> <p>SMC structures not visible properly due to heavy sedimentation as the structure was done many years before.</p> <p>The plantation site is close to human habitation.</p> <p>Maintenance of the site observed to be poor.</p>
ANR with Gap / Dabugaon/ Dabugaon/ Sulia	<p>Plantation in the 50 ha. site is done through block mode in different patches. Well maintained site with variety of species planted.</p> <p>The land was previously a forest land which was encroached and used as agricultural land by the locals. But due to community support and involvement and efforts of forest department it is converted to a forest through ANR plantation.</p> <p>No regenerated species found, barring a few cases.</p> <p>Villagers protect the plantation site voluntarily.</p>
ANR with Gap/ Nawarangpur/ Nawarangpur/ Nawarangpur	<p>Plantation of a total of 8000 trees total done in the site is at the growing stage.</p> <p>The plantation site is well maintained</p> <p>The site adopted for ANR with GP was degraded due to grazing. But now it is again coming to live due to CAMPA.</p> <p>Villagers protect voluntarily through VSS.</p>
ANR with Gap / Nawarangpur/ Papadahandi/ Tonguda	<p>Earlier, the site was a forest land which was converted it into agricultural land by the locals to meet production requirement. However, after regular consultation and motivational inputs, it is now again converted back to a plantation site.</p> <p>Due to recent storm, the standing trees were damaged and villagers (ladies) came for fuel wood collection and further damaged it by cutting the branches of the trees.</p> <p>The site includes indigenous species like Arjuna and Kendu.</p>
ANR without Gap (AJY)/ Umorkot/ Singsari/ Godkhunta	<p>No plantation is done under CAMPA.</p> <p>SMC structures have been created and maintenance has been done under CAMPA.</p> <p>The site has indigenous species like Sal, Chara, Dhaura, Bahada, Amla, Karada. Some planted trees include Chakunda, Nilgiri, Simaruba, Teak, Kanranja (Plantation not under CAMPA).</p>





Table 8.19: Observations: Rayagada Forest Division

Type of Assets	Observations
Bald Hill Plantation/ Rayagada/Nathama/ Nathama	Chillar plantation boundary, side branches forking not done properly
Bald Hill Plantation/ Muniguda/ Kuntabadi/ Salima	Trench fencing of dimension topped with 1 m, bottom width 0.7m and length of 1.2km. Was done to prevent soil erosion. Two rows of green bamboo fencing and chillar plant fencing is done around the plantation area.
Block Plantation/ Gunupur/Gunupu/ Gatalpadar	Roadside water harvesting structure to drink, medicinal plants in that regions. No weed removal process.
SSO timber/Muniguda/ Dangasorada/	SSO works have been done like climber cutting, high stump cutting etc.. LBCD structure- 15ft l, 3.3 ft top, upstream slope-1:1, downstream 1:2, head Wall extension is done both sides of LBCD.
ANR with GAP/ Muniguda/Ramnaguda/ Penkam	Roadside water harvesting structure to drink, medicinal plants in that regions. Weeds found growing in the plantation sites which require removal. Indigenous species found like Bela, Jamun, Amla, Asan, Bahada, Karada, Char, Sal, Kumbhi, Harida, Kendu, Piasal, Sunari, Sirisa, Mai etc.
Bamboo Plantation/ Muniguda/Kuntabadi/ Salima	Movement of Elephant herd witnessed two years ago, no pathway is visible currently. Congestion removal and thinning has been done.





## 9.15 Infrastructural Facilities:

Table 8.20: Usability of Buildings

Sl. No.	Type of Assets/ Location (Division/ Range/ Section/ Beat)	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Poor
1	Range Office Koraput Koraput Koraput Koraput	<ul style="list-style-type: none"> <li>Very well-organized office</li> <li>Used as Range Office.</li> </ul>	<ul style="list-style-type: none"> <li>Official works have been done smoothly.</li> </ul>	8	High
2	Common Toilet Koraput Koraput Koraput Koraput	<ul style="list-style-type: none"> <li>Well maintained toilet in DFO Office compound.</li> <li>Water supply to Common toilet.</li> </ul>	<ul style="list-style-type: none"> <li>Toilet facility available for all staff and civic sense developed among staff and visitors.</li> </ul>	8	High
3	Barrack Koraput Koraput Koraput Koraput	<ul style="list-style-type: none"> <li>2 storey building where 7-8 staffs are currently staying. The building is adjacent to the DFO office.</li> </ul>	<ul style="list-style-type: none"> <li>Staying facility available for Para staff helped in undertaking immediate patrolling work.</li> </ul>	9	High
4	Ranger Quarter Koraput Simliguda Simliguda Simliguda	<ul style="list-style-type: none"> <li>A good building with all facilities including electricity and sanitation. It has become easy for official works.</li> </ul>	<ul style="list-style-type: none"> <li>The forest work has been managed easily. The direct field supervision of the Range officer made easy. Information sharing became easy within a short period of time.</li> </ul>	9	High
5	Forester Quarter cum office Koraput Simliguda Simliguda Simliguda	<ul style="list-style-type: none"> <li>Fencing/ gate/ barbed wire</li> <li>Well protected</li> <li>Open area within the residence compound.</li> </ul>	<ul style="list-style-type: none"> <li>It is convenient to stay and perform his office and field responsibilities undertaking.</li> </ul>	8	High
6	Range Office Koraput Simliguda Simliguda Simliguda	<ul style="list-style-type: none"> <li>Well maintained office, Garden in front of office, Huge parking space</li> </ul>	<ul style="list-style-type: none"> <li>Official works have been made smooth with all available facilities.</li> </ul>	9	High
7	F.G Quarter Koraput Simliguda Simliguda Kunduli	<ul style="list-style-type: none"> <li>Forest Guard staying in this quarter.</li> </ul>	<ul style="list-style-type: none"> <li>Helped performing his duty regularly as compared to earlier because of distance to residential place where he was staying</li> </ul>	8	High



Sl. No.	Type of Assets/ Location (Division/ Range/ Section/ Beat)	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Poor
8	Range Office Koraput Balda Balda Balda	<ul style="list-style-type: none"> <li>Well maintained office,</li> </ul>	<ul style="list-style-type: none"> <li>Official works done smoothly and intime.</li> <li>Access to internet helped in better staff coordination of official communication.</li> </ul>	9	High
9	Forester Quarter cum office Koraput Balda Padua Balda	<ul style="list-style-type: none"> <li>Tubewell water is available.</li> <li>Operated the section office and forester of section has staying there.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building section office work done properly and smoothly.</li> </ul>	9	High
10	F.G Quarter Koraput Balda Padua Balda	<ul style="list-style-type: none"> <li>Tubewell water is available.</li> <li>Broken road which lead to the building. Car cannot reach there.</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard staying in this quarter and could abled to give more time for plantation activities as compared to earlier.</li> </ul>	8	High
11	F.G Quarter Jeypore Baipariguda Baipariguda Baipariguda	<ul style="list-style-type: none"> <li>Near Range office have a very good condition</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard staying in this quarter and it helped him to give more time for field activities.</li> </ul>	9	High
12	F.G Quarter Jeypore Baipariguda Baipariguda Baipariguda	<ul style="list-style-type: none"> <li>Forest guard quarter should be available drinking water and electricity</li> </ul>	<ul style="list-style-type: none"> <li>Since forest guard is staying this quarter enabled him to give more time for field activities.</li> </ul>	8	High
13	Range Office Jeypore Baipariguda Baipariguda Baipariguda	<ul style="list-style-type: none"> <li>A good building with all facilities including electricity and sanitation. It has become easy for official works as well as the management work from the forest area.</li> </ul>	<ul style="list-style-type: none"> <li>Office functioning made easy with availability of facilities.</li> </ul>	8	High
14	F.G Quarter Jeypore Jeypore Patraput Dimala	<ul style="list-style-type: none"> <li>No water facility</li> <li>Well water is not safe for consumption</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard staying in this quarter and could abled to give more time for plantation activities as compared to earlier.</li> </ul>	8	High



Sl. No.	Type of Assets/ Location (Division/ Range/ Section/ Beat)	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Poor
15	Barrack Jeypore Jeypore Patraput Dimala	<ul style="list-style-type: none"> <li>2 storey building.</li> <li>CCTV camera available.</li> </ul>	<ul style="list-style-type: none"> <li>Helped staff to doing patrolling smoothly as and when needed.</li> <li>Increased the team spirit of the patrolling staff.</li> </ul>	9	High
16	Ranger Quarter Jeypore Jeypore Patraput Dimala	<ul style="list-style-type: none"> <li>Building condition is good.</li> </ul>	<ul style="list-style-type: none"> <li>Helped range officer to execute, supervised and implement field activities.</li> </ul>	9	High
17	Boundary Wall Jeypore Jeypore Jeypore Naktidangara	<ul style="list-style-type: none"> <li>Cemented wall .</li> </ul>	<ul style="list-style-type: none"> <li>Helped in giving protection to the office premises of prevented trespassers.</li> </ul>	9	High
18	Forester Quarter cum office Jeypore Boriguma Boriguma Borigama	<ul style="list-style-type: none"> <li>A Office -cum- residential quarter with all required facilities.</li> </ul>	<ul style="list-style-type: none"> <li>Office work done properly with all facilities.</li> <li>The staff abled to give more time for office work.</li> </ul>	8	High
19	F.G Quarter Jeypore Boriguma Boriguma Borigama	<ul style="list-style-type: none"> <li>Well-furnished building</li> </ul>	<ul style="list-style-type: none"> <li>Helped forest guard to give time as per field requirement.</li> </ul>	8	High
20	Barrack Jeypore Boriguma Boriguma Borigama	<ul style="list-style-type: none"> <li>Patrolling staffs are staying here.</li> </ul>	<ul style="list-style-type: none"> <li>Due to the staff Barak, staff abled to do patrolling work smoothly and immediately. Helped them to work under emergent situation.</li> </ul>	8	High
21	Range Office Jeypore Boriguma Boriguma Dimala	<ul style="list-style-type: none"> <li>Operating Range office</li> <li>All facilities are available in this office</li> </ul>	<ul style="list-style-type: none"> <li>After having Range Office Building all the staff abled to work smoothly.</li> </ul>	8	High
22	F.G Quarter Jeypore Jeypore Patraput Dimala	<ul style="list-style-type: none"> <li>No drinking water facility, fencing is done</li> </ul>	<ul style="list-style-type: none"> <li>Increased security for forest guard who abled to give more time for plantation activities.</li> </ul>	7	Medium





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23	F.G Quarter Jeypore Jeypore Patraput Patraput	<ul style="list-style-type: none"> <li>Forest Guard staying in this quarter.</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard staying in this quarter able to give more time for departmental activities.</li> </ul>	8	High
24	Barrack Jeypore Boriguma Kalhaguda Baipariguda	<ul style="list-style-type: none"> <li>Patrolling staffs are staying here.</li> </ul>	<ul style="list-style-type: none"> <li>Become useful for accommodation and mobility of staff.</li> </ul>	6	Medium
25	F.G Quarter Jeypore Baipariguda Baipariguda Papadhandi	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet</li> <li>Used as forest guard quarter</li> <li>A single room with kitchen and toilet is available. No electricity and water supply</li> </ul>	<ul style="list-style-type: none"> <li>It is convenient for monitoring the plantation sites with team.</li> </ul>	8	High
26	F.G Quarter Nabarangpur Umarkot Dharra Umarkot	<ul style="list-style-type: none"> <li>Tube well water is used</li> <li>Forest Guard staying in this quarter.</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard staying this quarter so implementation forest activities become smoothened.</li> </ul>	7	Medium
27	Range Office Nabarangpur Umarkot Umerkot Umerkot	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Movement of forest work made easily. Facilitated the direct supervision of the Range officer in field activities. Information sharing became easy within a short period of time among staff and it helped in timely decision making.</li> </ul>	9	High
28	F.G Quarter Nabarangpur Umarkot Singisari Malgada	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet, electricity, tube well for drinking water and boundary wall for protection etc. are available.</li> <li>Used as forest guard quarter</li> </ul>	<ul style="list-style-type: none"> <li>Become convenient to monitoring the plantation sites their team.</li> </ul>	7	Medium



Sl. No.	Type of Assets/ Location (Division/ Range/ Section/ Beat)	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Poor
29	Barrack Nabarangpur Umarkot Umarkot	<ul style="list-style-type: none"> <li>Building with Common toilet, rooms, kitchen are available</li> <li>Used by squads and Para staff</li> <li>10 squads are staying in this barrack</li> </ul>	<ul style="list-style-type: none"> <li>Enabled Protection staff &amp; Para staffs to attend the patrolling works immediately.</li> </ul>	8	High
30	Range Office Nabarangpur Nabarangpur Nabarangpur Nabarangpur	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Movement of forest work made easily. Facilitated the direct supervision of the Range officer in field activities. Information sharing became easy within a short period of time among staff and it helped in timely decision making.</li> </ul>	7	Medium
31	F.G Quarter Nabarangpur Nabarangpur Nabarangpur	<ul style="list-style-type: none"> <li>One bed room, one drawing room, kitchen, toilet, electricity, tube well for drinking water and boundary wall for protection etc. are available.</li> <li>Used as forest guard quarter</li> </ul>	<ul style="list-style-type: none"> <li>Become convenient for monitoring the plantation sites with their team.</li> </ul>	7	Medium
32	F.G Quarter Nabarangpur Dabugam Dabugam Sarguli	<ul style="list-style-type: none"> <li>A single room with kitchen and toilet etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Become convenient for monitoring the plantation sites with their team.</li> </ul>	8	High
33	Forester Quarter cum office Nabarangpur Dabugam Dabugam Dabugam	<ul style="list-style-type: none"> <li>One office room, one bed room, kitchen, drawing room, toilet, electricity and open well for drinking.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building since the forester is staying, it helped him to join the patrolling team as and when required.</li> <li>Also functioning of office made easy.</li> </ul>	7	High



Sl. No.	Type of Assets/ Location (Division/ Range/ Section/ Beat)	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Poor
34	Range Office Malkangiri Balimela Balimela Orkil	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Fully functional office with all facilities available promoted better working environment.</li> </ul>	8	High
35	Watcher Shed Malkangiri Balimela Balimela Orkil	<ul style="list-style-type: none"> <li>One single room without electricity and water facility.</li> </ul>	<ul style="list-style-type: none"> <li>Made easy to move and perform office duties in checking fire incidents.</li> </ul>	7	Medium
36	Common toilet Malkangiri Balimela Balimela Orkil	<ul style="list-style-type: none"> <li>Well maintained toilet.</li> <li>Water supply to Common toilet.</li> </ul>	<ul style="list-style-type: none"> <li>Availabilities of toilet facility for all staff and improved civic sense among staff and visitors.</li> </ul>	8	High
37	F.G Quarter Malkangiri Balimela Balimela Orkil	<ul style="list-style-type: none"> <li>A single room with kitchen and toilet etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>It is convenient for monitoring the plantation sites with team.</li> </ul>	8	High
38	Range Office Malkangiri Mathili Gobindpalli Gobindpalli	<ul style="list-style-type: none"> <li>Well maintained office.</li> </ul>	<ul style="list-style-type: none"> <li>Movement of forest work made easily. Facilitated the direct supervision of the Range officer in field activities. Information sharing became easy within a short period of time among staff and it helped in timely decision making.</li> </ul>	8	High
39	Range Office Malkangiri Malkhangiri Malkhangiri Malkhangiri	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, internet facility etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Movement of forest work made easily. Facilitated the direct supervision of the Range officer in field activities. Information sharing became easy within a short period of time among staff and it helped in timely decision making.</li> </ul>	9	High





Sl. No.	Type of Assets/ Location (Division/ Range/ Section/ Beat)	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Poor
40	Barrack Malkangiri Malkhangiri Malkhangiri	<ul style="list-style-type: none"> <li>Building with Common toilet, rooms, kitchen are available</li> <li>Used by squads and Para staff.</li> </ul>	<ul style="list-style-type: none"> <li>Helped the patrolling staff to stay in the operation area and perform their duty perfectly.</li> </ul>	8	High
41	F.G Quarter Malkangiri Malkhangiri Padmagiri Akru	<ul style="list-style-type: none"> <li>A single room with kitchen and toilet etc. are available.</li> <li>Electricity is not available.</li> </ul>	<ul style="list-style-type: none"> <li>Helped forest guard to give more time for field activities.</li> </ul>	6	Medium
42	Range Office Rayagada Rayagada Rayagada Rayagada	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, etc. are available.</li> <li>CCTV cameras, well furnished buildings</li> </ul>	<ul style="list-style-type: none"> <li>Helped in improving work efficiency of forest staff.</li> </ul>	8	High
43	Common Toilet Rayagada Rayagada Rayagada Rayagada	<ul style="list-style-type: none"> <li>Have adequate water facility and separate toilet for both male and female</li> </ul>	<ul style="list-style-type: none"> <li>Availability of toilet facility for all staff and visitors.</li> </ul>	7	Medium
44	Barrack Rayagada Rayagada Rayagada Rayagada	<ul style="list-style-type: none"> <li>Used by para staff, anti poaching squad, anti depredation squad.</li> </ul>	<ul style="list-style-type: none"> <li>Protection staff &amp; Para staff able to attend their patrolling work smoothly and immediately.</li> </ul>	7	Medium
45	F.G Quarter Rayagada Rayagada Rayagada Rayagada	<ul style="list-style-type: none"> <li>A single room with kitchen and toilet etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Facilitated better field supervision of forest guard.</li> </ul>	8	High



Sl. No.	Type of Assets/ Location (Division/ Range/ Section/ Beat)	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Poor
46	Ranger Quarter Rayagada Rayagada Rayagada	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Movement of forest work made easily. Facilitated the direct supervision of the Range officer in field activities. Information sharing became easy within a short period of time among staff and it helped in timely decision making.</li> </ul>	9	High
47	Forester Quarter cum office Rayagada Rayagada Rayagada	<ul style="list-style-type: none"> <li>Forester with his family is staying there.</li> </ul>	<ul style="list-style-type: none"> <li>Helped in doing office work properly and on time.</li> </ul>	8	High
48	Range Office Rayagada Rayagada Muniguda Gunpur	<ul style="list-style-type: none"> <li>One room for range officer, one computer room, one second officer room, two hazats with attached toilet for gents and ladies, common space, electricity, toilet, pipe water supply, etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Movement of forest work made easily. Facilitated the direct supervision of the Range officer in field activities. Information sharing became easy within a short period of time among staff and it helped in timely decision making.</li> </ul>	8	High
49	Forester Quarter cum office Rayagada Rayagada Muniguda Gunpur	<ul style="list-style-type: none"> <li>Forester with his family is staying there.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building since the forester is staying, it helped him to join the patrolling team as and when required.</li> <li>Also functioning of office made easy.</li> </ul>	7	Medium
50	Watcher Shed Rayagada Rayagada Muniguda Gunpur	<ul style="list-style-type: none"> <li>Maintenance is highly required. Other facility should be improved.</li> </ul>		3	Poor
51	F.G Quarter Rayagada Rayagada Gumma Gumma	<ul style="list-style-type: none"> <li>A single room with kitchen and toilet etc. are available.</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard staying this quarter so implementation forest activities become smoothened.</li> </ul>	6	Medium



Table 8.21: Usability of Forest Road, Causeway, Culvert

SL. No	Type of Assets/ Location (Division/ Range/ Section/ Beat)	Special Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - Good, Average, Poor
1	Forest road Malkangiri Balimela Somnathpur Somnathpur	<ul style="list-style-type: none"> <li>Used as forest road</li> </ul>	<ul style="list-style-type: none"> <li>Ensured easy accessibility to the forest by staff and frieng village people.</li> </ul>	8	High
2	Causeway Malkangiri Balimela Somnathpur	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> </ul>	<ul style="list-style-type: none"> <li>Accessibility to the forest even during rainy season made easy.</li> </ul>	8	High
3	Culvert Malkangiri Mathili Gobindpalli Gobindpalli	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Used as culvert on the forest road.</li> </ul>	<ul style="list-style-type: none"> <li>Made the mobility in all season easy for forest people and villagers.</li> </ul>	8	High
4	Causeway Malkangiri Malkhangiri pandripani Padripani	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms on the forest road.</li> </ul>	<ul style="list-style-type: none"> <li>Promoted easy mobility of forest staff in all seasons.</li> </ul>	9	High
5	Culvert Malkangiri Malkhangiri Padripani Padripani	<ul style="list-style-type: none"> <li>Concrete structure constructed following all norms</li> <li>Used as culvert on the forest road.</li> </ul>	<ul style="list-style-type: none"> <li>Helped in timely execution of activities of the site level.</li> <li>Improved mobility facilities.</li> </ul>	8	High

Table 8.21: Usability of Forest Road, Causeway, Culvert

Sl. No.	Type of Assets/ Division/ Range/ Section/ Beat	Special Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset -Good, Average, Poor
1	Water body Koraput Koraput Podagarh Janiguda	<ul style="list-style-type: none"> <li>It is a perennial water body used for animal use. It is also for fishing but the fishes died due to high temperature in last year.</li> <li>The seepage water from the water body is used for agriculture purpose</li> </ul>	<ul style="list-style-type: none"> <li>Availability of drinking water for wild animal throughout the year.</li> </ul>	8	Good





Sl. No.	Type of Assets/ Division/ Range/ Section/ Beat	Special Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset -Good, Average, Poor
2	Water body Malkangiri Balimela Somnathpur	<ul style="list-style-type: none"> <li>Villagers use it for bathing and agriculture through canals.</li> <li>It is even used for fish cultivation.</li> <li>There has been increase in ground water level also as the water seeps in the ground.</li> </ul>	<ul style="list-style-type: none"> <li>Water source available for wild animals and irrigation purpose.</li> <li>Tended to increase ground water level in forest fringe villages.</li> </ul>	9	Good
3	Water body Koraput Balda Padua Bhimdul	<ul style="list-style-type: none"> <li>It is a perennial water body. It is used for agriculture by the villagers when the water is sufficient in it. Currently it has relatively less.</li> </ul>	<ul style="list-style-type: none"> <li>Available drinking water for wild animal throughout the year.</li> </ul>	8	Good
4	Water Body Jeypore Jeypore Jaynagar Kuntakhal	<ul style="list-style-type: none"> <li>It is a perennial water body.</li> <li>Bank slope is available</li> </ul>	<ul style="list-style-type: none"> <li>Wild animals used this water throughout the year</li> </ul>	7	Good
5	Water body Nabarangpur Nabarangpur Tumbarla Podagarah	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes</li> </ul>	<ul style="list-style-type: none"> <li>Availability of water for wild animals round the year.</li> </ul>	8	Good
6	water body Nabarangpur Dabugam Dabugam Jhaliguda	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Wild animals used water water throughout the year for drinking and bathing purposes.</li> </ul>	7	Medium
7	Water body Malkangiri Mathili Gobindpuri Gobindpuri	<ul style="list-style-type: none"> <li>Seasonal water body.</li> <li>Periphery of water body is planted with fruit bearing trees to attract wild animals.</li> <li>Steps are made to reach to the water level.</li> </ul>	<ul style="list-style-type: none"> <li>Water for drinking and bathing purpose of wild animals made available round the year.</li> </ul>	8	Good



Sl. No.	Type of Assets/ Division/ Range/ Section/ Beat	Special Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset -Good, Average, Poor
8	Water Body Rayagada Rayagada Muniguda Khudliga	<ul style="list-style-type: none"> <li>Wild animals are using this water body for drinking and bathing purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Wild animals used this water throughout the year</li> </ul>	8	Good

Table 8 23: Nursery and zoo management

SL. No	Type of Assets/ Location (Division/ Range/ Section/ Beat)	Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset -High, Medium, Poor
1	Central Nursery Koraput Koraput Koraput Koraput	<ul style="list-style-type: none"> <li>Drying yard, pump house, work station, compost pit, motor, bore well, gate, watchmen shed, ,masonry and equipment, compost go down,etc. are available</li> </ul>	<ul style="list-style-type: none"> <li>Availability of quality planting materials for sites with reasonable cost as compared to local nursery.</li> </ul>	8	High
2	Deer Park Nabarangapur Papadahandi Berajharan	<ul style="list-style-type: none"> <li>A lot of types of infrastructures such as water body, road, steps, beautification and electrification has been done under CAMPA.</li> </ul>	<ul style="list-style-type: none"> <li>Developed as recreation spot and local people had access for site seen.</li> </ul>	8	High

Table 8.24: Created Infrastructural Facilities under CAMPA

SN	Facilities	Jeypore	Koraput	Malkangiri	Nabarangapur	Rayagada	Total
A	Infrastructure						
1	Range Office	3	3	3	2	2	13
2	Range officer's Residence	1	1			1	3
3	Forester Quarter cum residence	1	2		1	3	7
4	Forest Guard Quarter	7	2	2	5	3	19
5	Malkahana				1		1
6	Common Toilet		2	1		1	4
7	Seizure Yard			1	1	2	4
8	Causeway			2			2



SN	Facilities	Jeypore	Koraput	Malkangiri	Nabarangapur	Rayagada	Total
9	Culvert			3			3
10	Forest Road			1			1
11	Boundary Wall	1				1	2
12	Barrack	3	1	1	1	1	7
13	Tube Well					2	2
14	Watcher Shed			1		1	2
15	Well	1					1
16	Nursery Fencing			1			1
17	Water Facility (Syntax)			1			1
B	Wild life infrastructure						
18	Deer Park				1		1
19	Water Body	1	3	1	2	1	8
C	Nursery						
20	Central Nursery		1				1
21	Mega Nursery					1	1

Table 8.25: Number of Infrastructures Rated “Good”

SN	Rated Good Infrastructures	Forest Division					Total
		Jeypore	Koraput	Malkangiri	Nabarangapur	Rayagada	
<b>A</b>	<b>Infrastructure</b>	3	3	3		2	11
1	Range Office	1	1			1	3
2	Range officer's Residence	1	2		1	1	5
3	Forester Quarter	6	2	1	3	3	15
4	Forest Guard Quarter				1		1
5	Malkahana		2	1			3
6	Common Toilet			1	1	2	4
7	Seizure Yard			2			2
8	Causeway			3			3
9	Culvert			1			1
10	Forest Road	1				1	2
11	Boundary Wall	2	1	1			4
12	Barrack					2	2
13	Tube Well						0
14	Watcher Shed	1					1
15	Well			1			1
16	Nursery Fencing			1			1
17	Water Facility (Syntex)						
<b>B</b>	<b>Wild life infrastructure</b>				1		1
18	Deer Park	1	3	1	2	1	8





19	Water Body						
<b>C</b>	<b>Nursery</b>		<b>1</b>				<b>1</b>
20	Central Nursery					1	1
21	Mega Nursery						

Table 8.26: Infrastructures Rated Average

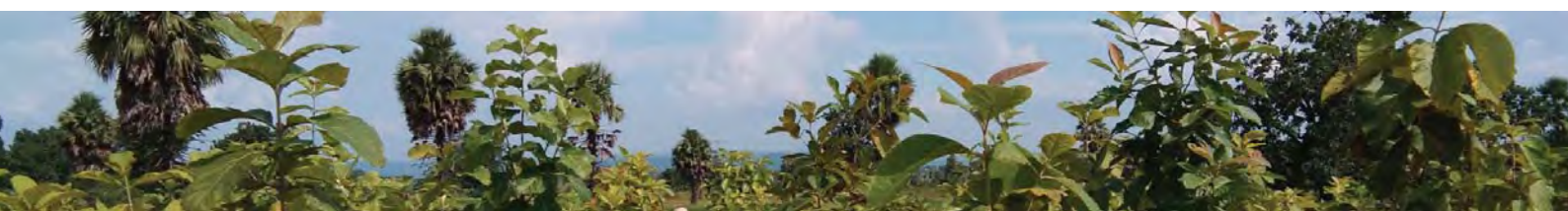
SN	Average	Jeypore	Koraput	Malkangiri	Nabarangapur	Rayagada	Total
A	Infrastructure						
1	Range Office				2		2
2	Forester Quarter					2	2
3	Forest Guard Quarter			1	2	2	5
4	Common Toilet					1	1
5	Barrack	1			1	1	3
6	Watcher Shed			1			1

Table 8.27: Infrastructures Rated Poor

SN	Infrastructure	Jeypore	Koraput	Malkangiri	Nabarangapur	Rayagada	Total
1	Forest Guard Quarter	1					1
2	Watcher Shed					1	1

## 8.16 Summary of Key Findings

- Koraput forest circle is spread over four districts, namely Koraput, Malkangiri, Nabarangpur and Rayagada.
- It is having five forest divisions, i.e., (1) Jeypore, (2) Koraput, (3) Malkangiri, (4) Nabarangpur and (5) Rayagada.
- The district of Koraput is having geographical area of 8,807 sq. km. of which 94.48 sq. km is under very dense forest category, 740.41 sq. km. is moderately dense forest and 1,263.38 sq. km is open forest.
- Key plantation activities that have been taken up in the circle are block plantation, ANR with enrichment planting, bald hill plantation, avenue plantation and CA PCA.
- Block plantation was taken up in 2009-10, covering a total of 2,662 ha. ANR with gap plantation covered a total area of 3,430 ha. in 2014-15 and 9,800 ha. in 2015-16. Avenue plantation in the year 2009-10 covered a total area of 2,662 ha. In bald hill plantation, 250 ha. covered in the year 2011-12, 197 ha. in 2012-13 and 180 ha. in 2015-16.
- Under silvicultural operations, activities taken up are like SSO-Timber, SSO-Bamboo, ANR without Gap plantation, maintenance of old Teak plants and management of economic species.
- The study covered all the five forest divisions of the circle under different components of CAMPA. The forest divisions covered are (1) Jeypore, (2) Koraput, (3) Malkangiri, (4) Nabarangpur and (5) Rayagada. Under the forest divisions, 15 ranges were covered under the study.
- The plantation sites cover (1) ANR with gap plantation (46.9 percent), (2) bald hill plantation (15.6 percent), (3) bamboo plantation (6.3 percent) and (4) block plantation sites (31.3 percent). In silvicultural operation, the study covered (1) ANR without gap plantation (57.1 percent), (2) SSO-Bamboo (28.6 percent) and (3) SSO timber (14.3 percent).
- Overall, mortality rate is calculated to be 9.6 percent. Highest plant mortality is reported in Koraput forest division (19.1 percent) followed by Malkangiri (12.6 percent) and lowest in Rayagada forest



division (4.9 percent).

- In block plantation, average no. of plants per ha. enumerated to be 1,474 with highest average number of plants in Nabarangpur (1596) and lowest in Malkangiri (1380).
- In bald hill plantation, average no. of plants per ha. enumerated to be 1,478 with highest average number of plants in Rayagada (1,555) and lowest in Koraput (1,410).
- Average number of plants per ha. enumerated to be 175 with highest number of plants per ha. in Jeypore (187) and lowest in Koraput (155).
- It is observed in the assessment that the canopy cover varies by plantation types and year of plantation.
- No. of pillars have been erected based on the plantation / silviculture area and shape of the plot.
- Different SMC works have been taken up based on its locational suitability and assessed requirements. Different SMC activities taken up in plantation sites are staggered trench, half-moon trench, LBCD, check dam structure etc.
- The mean maximum height of the plants, irrespective of the year of plantation and plant species, calculated to be 7.06 mt. The mean minimum height of the plants at the circle level found to be 3.86 mt. for the plantation sites. Similarly, mean maximum GBH/GCH has been 25.73 cm and mean minimum GBH/GCH has been 13.05 cm.
- Plant protection measures taken are like fencing, fire protection measures, watch and ward etc. In certain cases, villages and VSS have been found taking care of the local forest area and plantation sites.
- Survival percentage and Growth rate of plants under Block plantation is better as compared to ANR plantations indicating adoption of better after care practices.
- Timber species are mostly preferred for plantation under CAMPA.
- A lot of encroached land have been converted into plantation site due to CAMPA intervention. It has made possible due to peoples motivation and involvement of VSS.
- Different records / documents are maintained at the range office level with respect to plantation / silvicultural activities, such as plantation journal, plantation site map, treatment map and other registers.

### 8.17 Suggestion

- Plantations done in the year 2009-10 are mostly mono-culture and need to be diversified.
- SMC works were not done during the 1st phase of CAMPA during 2009-10
- Watch & ward and maintenance is done only upto 3 years after plantation. This may be given upto 10 years of plantation to ensure minimum casualty
- In some sites, sign boards are either not made or are broken which makes it difficult to identify the sites. Thus new sign boards may be installed for transparency and identification of site location.
- Poly culture mode of plantation should be practised in all plantation type so that the plantation patches have different canopy layers.
- Indigenous plant species may be planted
- Fruit bearing tree species may be planted along with other species as it will promote interest of the locals for protection and will also give some livelihood to them.
- Initiatives should be taken to include local VSS for protection of all type of plantations.
- RCC pillar should be constructed in every plantation site.
- Provision for fencing should be made compulsory for all type of plantations.
- A lot of infrastructures have been made under CAMPA fund. Most of the Range offices, Quarters, Section offices, Beat House were constructed. But provisions for repairing and maintenance may be made for future use and durability of the assets.





- Permanent electricity connection and water connection were not provided to some of the buildings. For better use permanent electricity and water supply connection should be made at all of the offices and buildings created under CAMPA.

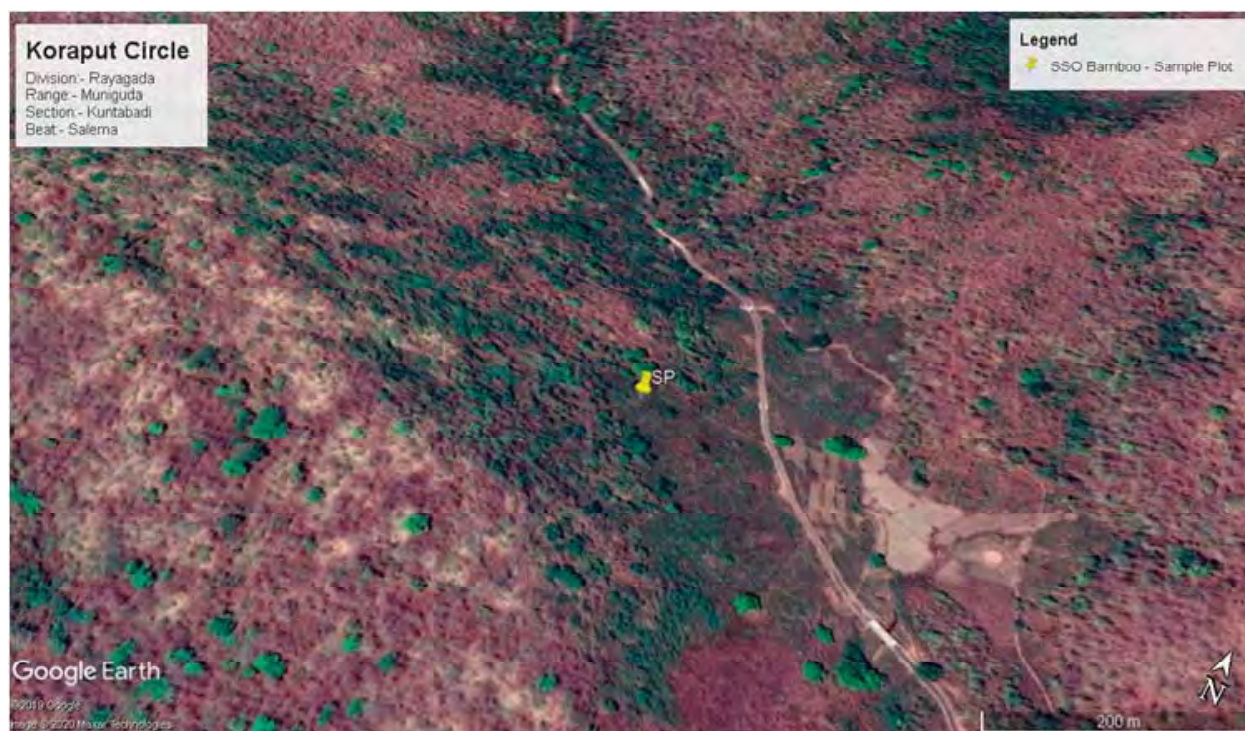
## 8.18 Satellite imagery of sample plots

















## CHAPTER - IX







## 9. Evidence of CAMPA implementation in Rourkela Circle

Rourkela Forest Circle spreads over five territorial forest divisions Bonei, Rourkela, Sundargarh in Sundargarh districts, Deogarh in Deogarh district and Keonjhar in Keonjhar district and Keonjhar wildlife division covering Sundargarh, Keonjhar and Deogarh districts. In the process of development, due to massive industrial and mining activities including highway and road expansion projects, Sundargarh and Keonjhar districts have marked maximum environment degradation in the shape of tree felling. On the basis of geo-morphological classification, Rourkela circle is covered under Northern Plateau (old districts of Mayurbhanj, Keonjhar and Sundargarh), and Central Table Land (old districts of Bolangir, Dhenkanal and Sambalpur). The forest region also hosts important elephant corridors in Odisha.

During the period 2009-10 to 2016-17, a number of CAMPA enabled activities were undertaken separately by all of the forest divisions of this circle. Present chapter seeks to establish evidences of CAMPA intervention by analysing outcome performances of all types of assets created under CAMPA. With this purpose, on sample basis different plantation as well as non-plantations assets from three selected forest ranges of each of the forest divisions under Rourkela circle were evaluated during the period October 2019 to January 2020. Section-1 of this chapter analyses the outcome performance of plantation activities and the subsequent section deals outcome performance of other than plantation activities.

### 9.1 Sample Coverage

The study covers all the forest divisions and all types of plantation related activities undertaken under CAMPA. Division wise forest ranges covered in the study is shown in the chart given alongside.

The details of sampled out activities under plantation activities, SSO, and CRM Activities is as per the following table. The study cover AR plantations consisting of bamboo plantation, bald-hills plantation, block plantation, Safety zone Plantation; ANR Plantation comprising of ANR with gap and ANR without gap plantation; SSO Activities for Bamboo Plantation; CRM activities pertaining to Old teak management and AJY and MWS involved plantation activities.

Division and range wise sampled out plantation sites is as per the following table-9.1. For the purpose of evaluation, the study covers 130 plots under 40 plantations sampled out plantation sites. On an average, three plots systematically chosen from each of the sample sites are covered in the study.

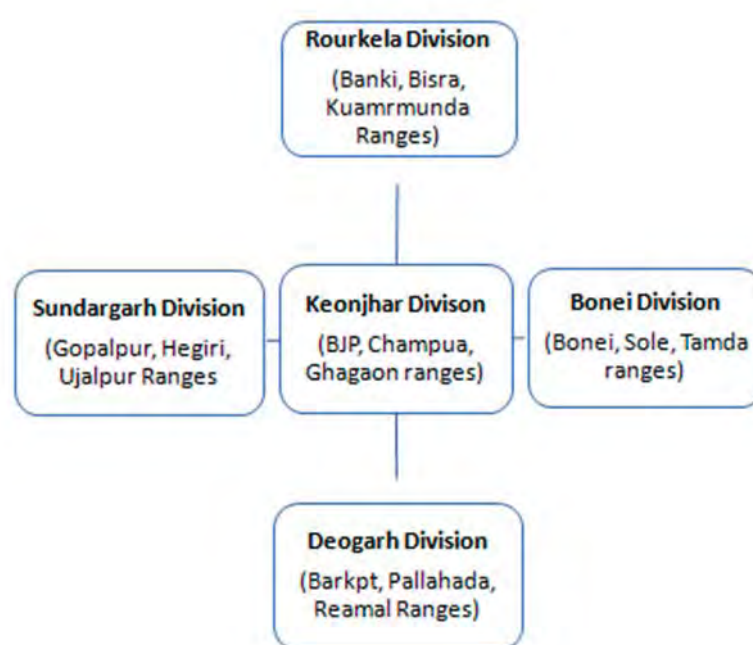


Figure 9.1: Sample Coverage of Rourkela Circle

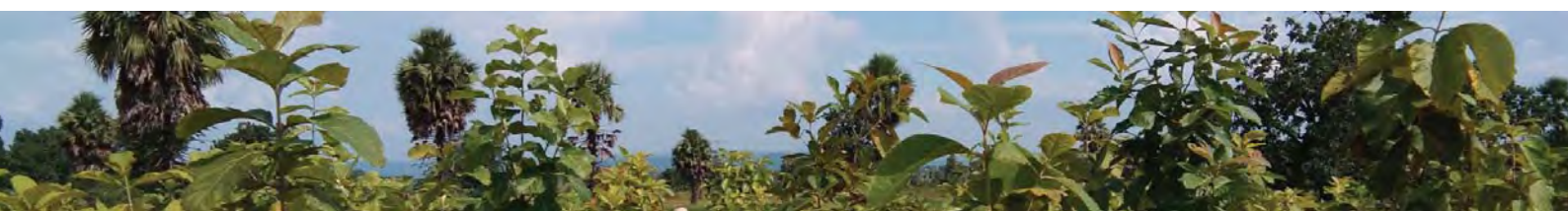




Table 9.1: Sample Coverage of Plantation related Assets

Sl.	Type of Assets	Divisions	No of Sites	Total no of plots
A	ANR with Gap Plantation	Bonei	2	6
		Deogarh	3	10
		Keonjhar	4	16
		Rourkela	2	10
		Sundargarh	3	15
		Total	14	57
B	ANR without Gap AJY	Bonei	1	2
		Deogarh	1	2
		Keonjhar	1	2
		Total	3	6
C	Baldhill Plantation	Keonjhar	1	1
		Rourkela	1	2
		Sundargarh	1	1
		Total	3	4
D	Bamboo plantation	Bonei	1	5
		Total	1	5
E	Block Plantation	Bonei	1	5
		Deogarh	1	5
		Keonjhar	1	2
		Rourkela	1	1
		Total	4	13
F	Block plantation AJY	Rourkela	1	1
		Total	1	1
G	Block Plantation (MWS)	Rourkela	1	2
		Total	1	2
H	CA ANR with Gap Plantation	Sundargarh	1	5
		Total	1	5
I	CA Block Plantation	Deogarh	1	2
		Keonjhar	1	1
		Rourkela	1	1
		Total	3	4
J	CA Safety Zone Plantation	Keonjhar	1	1
		Total	1	1
K	Old Teak Management	Bonei	1	5
		Deogarh	1	2
		Sundargarh	1	1
		Total	3	8
L	PCA ANR with gap Plantation	Bonei	1	4



Sl.	Type of Assets	Divisions	No of Sites	Total no of plots
		Total	1	4
M	SSO Bamboo	Bonei	1	5
		Deogarh	1	5
		Rourkela	1	5
		Sundargarh	1	5
		Total	4	20
		<b>Grand Total</b>	<b>40</b>	<b>130</b>
	<b>Number of plots per sample site</b>			<b>3.25</b>

Apart from plantation related activities, a lot of other than plantation activities are also taken up under CAMPA. The details of the sample out other than plantation assets that are created under CAMPA during the period 2009-10 to 2016-17 is as mentioned in table 9.2.

*Table 9.2: Sample coverage of other than Plantation Assets*

Sl.	Components	Deogarh	Keonjhar	Bonei	Rourkela	Sundargarh	All Divisions
1	Forest guard quarter	1	1	1	1	2	6
2	Forester quarter	2	1	0	0	1	4
3	Range office	1	1	1	1	1	5
4	Staff Barak	0	1	0	1	0	2
5	Watcher shed	0	1	0	0	0	1
6	Labour Shed	0	0	0	1	0	1
7	Check gate with Rest shed	0	0	0	1	0	1
8	Causeway	0	0	1	0	1	2
9	Small bridge	0	0	0	0	1	1
10	Nursery	1	0	2	1	1	5
11	Antipoaching check gate	0	0	1	0	0	1
12	Sacred Grove	1	0	1	0	2	4
13	Solar Fencing	0	0	1	0	1	2
14	Seizure Yard	1	0	2	1	0	4
15	Malkhana	0	0	1	0	0	1
16	Residence of Ranger	0	0	1	0	1	2
17	Boundary well	0	0	1	0	1	2
18	Water body	2	1	0	1	1	5
19	Elephant Trench	1	1	0	1	0	3
20	VH Tower	0	1	0	0	0	1
21	Salt lick	1	0	0	0	1	2
22	Forest Road	0	0	0	1	0	1
23	Entry point Activity (Road)	1	0	0	0	0	1
24	Tube well	1	0	0	0	0	1
25	Protection squad	0	0	0	0	1	1



Sl.	Components	Deogarh	Keonjhar	Bonei	Rourkela	Sundargarh	All Divisions
26	Para staffs	0	0	0	0	1	1
	Total other assets	13	8	13	10	16	60

## 9.3 AR Plantation

### 9.3.1 Tree Diversity under AR Plantation

Mostly seedlings of 25 varieties of tree species are transplanted in CAMPA plantation activities including ANR with gap plantation. Tree diversity is calculated by examining number of trees transplanted per 10000 trees. Accordingly, teak, acacia, karanja, simaruba, sanachakunda constitute to be the five major tree species undertaken under CAMPA aided plantation activities.

*Table 9.3: Diversity and Intensity of trees under AR & ANR Plantation.*

Sl.	Tree Diversity	No of trees witnessed	Intensity of trees
1	Teak	4550	3806
2	Acacia	1614	1350
3	Karanja	889	744
4	Simaruba	849	710
5	Sanachakunda	746	624
6	Bamboo	658	550
7	Neem	563	471
8	Badachakunda	499	417
9	Sishoo	408	341
10	Chatiyana	266	223
11	Gambhari	151	126
12	Cashew	145	121
12	Mangium	112	94
14	Mahaneem	102	85
15	Salia Bamboo	97	81
16	Amla	84	70
17	Khaira	60	50
18	Arjun	51	43
19	Sirisa	46	38
20	Jamu	18	15
21	Kanchan	13	11
22	Eucalipotus	12	10
23	Bahada	9	8
24	Bela	7	6
25	Mango	6	5
	Grand Total	11955	10000





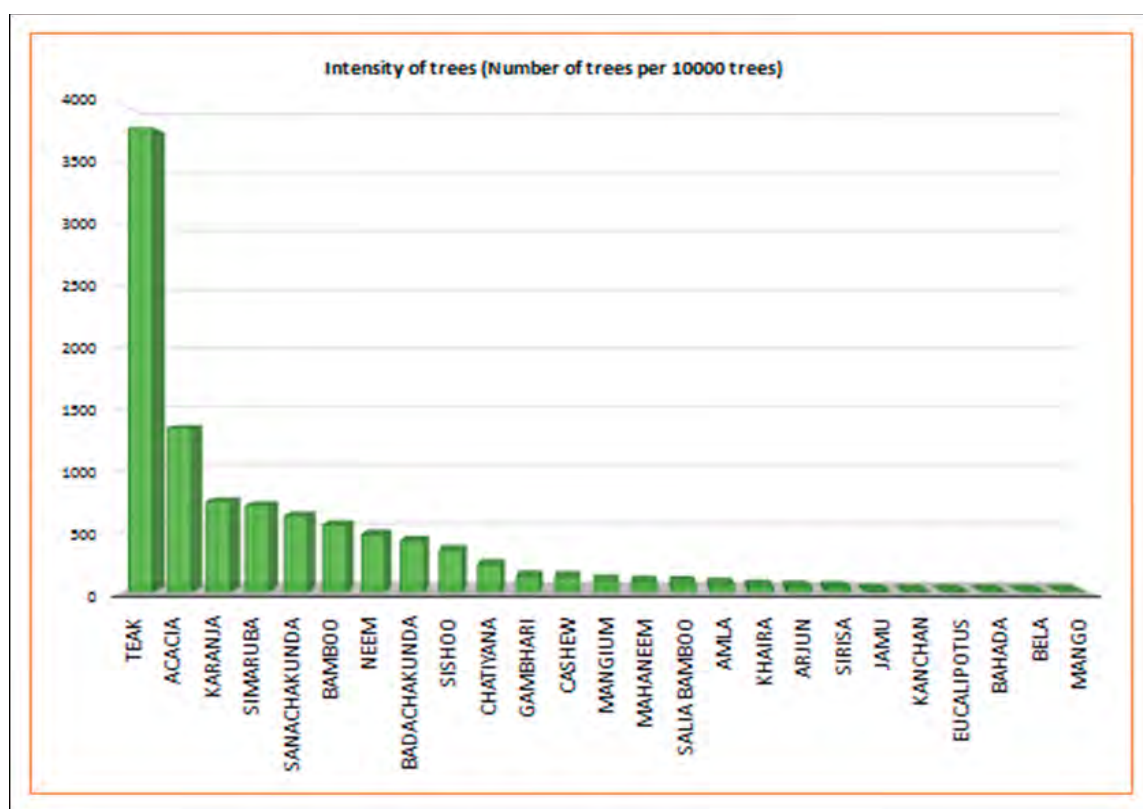


Figure 9:2: Intensity of trees -number of trees per 10000 trees

### 9.3.2: Average Area per site under AR Plantation

AR plantation under Rourkela forest circle comprises of bald hills plantation, bamboo plantation, block plantation and safety zone plantation. The average area under AR plantation per site stands at 51.3 hectares which is higher in the case of bamboo plantation. Average area per site of safety zone plantation found stands lowest at 1.7 hectares. The safety zone plantation is carried out in Rungta Mines area with financial support of Rungta mines.

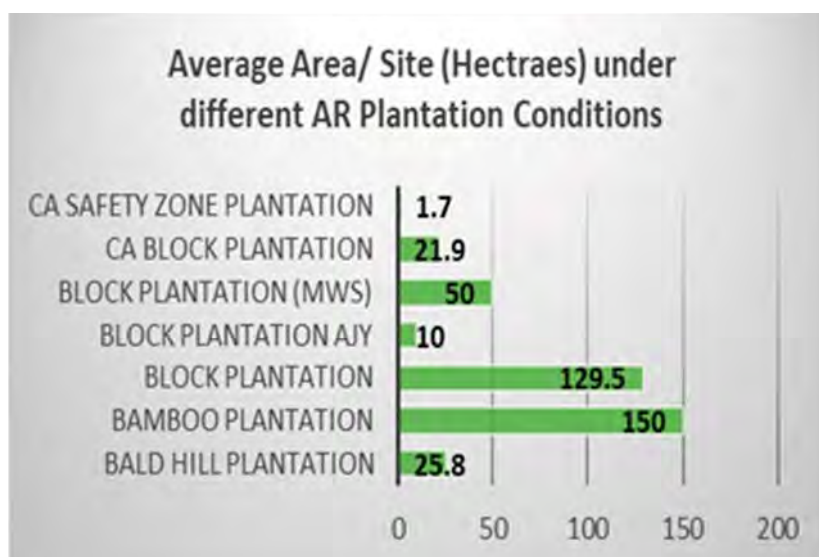


Figure 9:3: Average Area / Site under different AR plantation conditions



Table 9.4: Average Area under AR Plantation

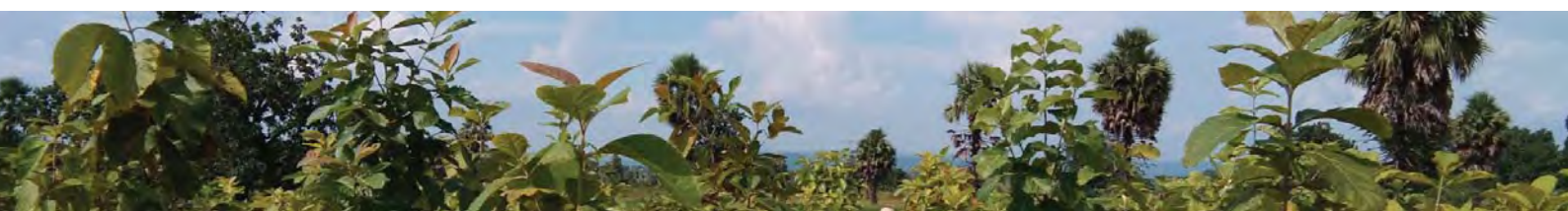
Sl.	Type of Plantation Activity	Average forest area under CAMPA intervention (Hectares)					
		Bonei	Deogarh	Keonjhar	Rourkela	Sundargarh	All Divisions
1	Bald hill Plantation			20.0	30.0	23.0	25.8
2	Bamboo plantation	150.0					150.0
3	Block Plantation	192.0	130.0	30.0	13.5		129.5
4	Block plantation AJY				10.0		10.0
5	Block Plantation (MWS)				50.0		50.0
6	CA Block Plantation		35.0	8.2	9.3		21.9
7	CA Safety Zone Plantation			1.7			1.7
	Total	114.0	55.0	15.0	22.6	11.5	51.3

### 9.3.3 Survival and Casualty Performance

The survival and casualty of trees under different type plantation conditions as shown in the following table 5 reveals that overall casualty and survival considering all plantation categories and all forest divisions is found at 8.05 and 91.95 percent respectively. On the basis of survivals performance criteria as mentioned in the last column of the table, overall performance of all AR plantations stands 'high'. The performance of bald hills plantations, Block plantations with AJY involvement, MWS supported block plantations and CA block plantations are found high. However, the performance of general block plantation is found 'medium'. The same is the case of bamboo plantation.

Table 9.5: AR Plantation performance on the basis of survival and Casualties per hectare of plantation area

Sl.	Type of Plantation	Division	Average No. of surviving trees	Average no of casualties of trees	Total	Survival (%)	Survival based Plantation Performance (High, > or = 90 percent, Medium <90 10 to > or= 80 percent, Low<80 percent)
1	Baldhill Plantation	Keonjhar	1600	0	1600	100.0	
		Rourkela	1500	110	1610	93.1	
		Sundargarh	1560	50	1610	96.9	
		Total	1540	70	1610	95.8	High
2	Bamboo plantation	Bonei	190	40	230	84.0	
		Total	190	40	230	84.0	Medium
3	Block Plantation	Bonei	1360	190	1540	87.9	
		Deogarh	1440	160	1600	89.8	
		Keonjhar	1360	250	1600	84.7	
		Rourkela	1260	340	1600	78.8	





Sl.	Type of Plantation	Division	Average No. of surviving trees	Average no of casualties of trees	Total	Survival (%)	Survival based Plantation Performance (High, > or = 90 percent, Medium <90 10 to > or= 80 percent, Low<80 percent)
		Total	1380	200	1580	87.4	Medium
4	Block plantation AJY	Rourkela	1470	130	1600	91.9	High
5	Block Plantation (MWS)	Rourkela	1460	50	1510	96.7	High
6	CA Block Plantation	Deogarh	1450	140	1590	91.5	
		Keonjhar	1540	60	1600	96.3	
		Rourkela	1430	170	1600	89.4	
		Total	1470	130	1590	92.2	High
7	CA Safety Zone Plantation	Keonjhar	1510	90	1600	94.4	
8	Over all		1370	120	1490	91.9	High

### 9.3.4 Canopy Performance

The coverage of canopy in percentage terms indicates that overall canopy coverage in all AR plantation categories stands at 49.8 percent which is found higher in Bonei and Sundargarh divisions. The canopy-based plantation performance as mentioned in the last row of table- 9.6 points out that the overall performance of AR plantation on the basis of canopy coverage. Out of five forest divisions, canopy-based performance of AR plantations in Bonei, Deogarh and Sundargarh is found 'medium' relative to 'low' for Keonjhar and Rourkela divisions.

Table 9.6: AR Plantations performance by Canopy performance.

Type of Plantation	Bonei	Deogarh	Keonjhar	Rourkela	Sundargarh	All
Baldhill Plantation			40.0	30.0	55.0	38.8
Bamboo plantation	60.0					60.0
Block Plantation	65.0	80.0	30.0	60.0		65.0
Block plantation AJY				20.0		20.0
Block Plantation (MWS)				70.0		70.0
CA Block Plantation		20.0	20.0	40.0		25.0
CA Safety Zone Plantation			70.0			70.0
Grand Total	62.5	50.0	40.0	44	55.00	49.8
Plantation performance on the basis of canopy performance (High, > or= 70 percent, Medium <70 or > and =50 percent, Low <50 percent)	Medium	Medium	Low	Low	Medium	Low



### 9.3.5 Height and GBH/GCH Performance

The performance of AR plantations on the basis of height and GBH/GCH is assessed as per the analysis made in the table- 9.7. With the objective of height performance, the difference between average of maximum heights and minimum heights per year for all the trees are separately analysed for all types of AR plantation situations. are considered. It is viewed that less is the difference between the two, better is the intervention results. Similarly, GBH/GCH performance is also calculated for all types of trees under all types of plantation situations. It is found that performance of all type of AR plantations on the basis of height as well as GBH/GCH is found 'high'.





Table 9.7 : Height and GBH/GCH Performance of Trees

Type of Plantation	Type of trees	Average of Max Height in Metre	Average of Min Height in Metre	Average of MAX HEIGHT PER YEAR	Average of MIN HEIGHT PER YEAR	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average of MAX GBH/ GCH PER YEAR	Average of MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ year & Ave Minimum GHH/ Year	Height Performance (High < or =0.5, Medium >0.5 or =1, Low >1,)	GBH/GCH Performance (High < or =3.0, Medium >3.0 or =5, Low >5, )
Bald-hill Plantation	Acacia	6.6	4.5	1.2	0.8	14.5	12	2.6	2.1	0.4	0.5		
	Badachakunda	3.7	1.7	0.9	0.4	10.5	3.5	2.6	0.9	0.5	1.7		
	Cashew	3	2	0.7	0.5	10.5	6.5	2	1.1	0.2	0.9		
	Gambhari	3.5	2.2	0.9	0.6	9	6.5	2.3	1.6	0.3	0.7		
	Karanja	2.4	2	0.7	0.6	13.7	6.7	3.7	1.9	0.1	1.8		
	Mango	3.7	3.2	1.2	1.1	13	10	4.3	3.3	0.1	1		
	Neem	3	2.3	0.8	0.6	11.7	8	3.3	2.2	0.2	1.1		
	Sanachakunda	5.6	3.7	0.7	0.5	9	7	1.1	0.9	0.2	0.2		
	Simaruba	4	3.2	1.1	0.9	14.3	11	3.9	2.9	0.2	1		
	Teak	5.3	5.1	1.3	1	13.8	10.5	3.4	2.6	0.3	0.8		
	Total	4	3.1	1	0.7	12.4	8.4	3.1	2	0.3	1.1	High	High
Bamboo plantation	Salia Bamboo	1.1	0.7	0.2	0.1			0	0	0.1	0		
	Total	1.1	0.7	0.2	0.1			0	0	0.1	0	High	High
Block Plantation	Acacia	7.1	6.3	1.1	0.9	21	14.3	3.2	2.2	0.2	1		
	Amla	1.2	1	0.3	0.3	7	5	1.8	1.3	0	0.5		
	Badachakunda	4.2	3.8	0.9	0.8	23	15	4.3	2.8	0.1	1.5		
	Cashew	5.7	4.7	1.4	1.2	29.6	17.8	7.4	4.5	0.2	2.9		
	Chatiyana	4.1	2.1	0.7	0.3	19.4	11	3.2	1.8	0.4	1.4		



Type of Plantation	Type of trees	Average of Max Height in Metre	Average of Min Height in Metre	Average of MAX HEIGHT PER YEAR	Average of MIN HEIGHT PER YEAR	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average of MAX GBH/ GCH PER YEAR	Average of MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ GCH/ year & Ave Minimum GHH/ Year	Height Performance (High < or =0.5, Medium >0.5 or =1, Low >1,)	GBH/GCH Performance (High < or =3.0, Medium >3.0 or =5, Low >5, )
	Eucaliptus	6.9	6.2	1.7	1.6	22	17	5.5	4.3	0.1	1.2		
	Gambhari	5.2	4.3	0.9	0.7	36	24	6	4	0.2	2		
	Karanja	3.7	2.5	0.8	0.6	14.8	10.3	3.3	2.4	0.2	0.9		
	Khair	3.6	3.2	0.9	0.8	9	6	2.3	1.5	0.1	0.8		
	Mahaneem	6.3	5.6	1.6	1.4	37.3	22.7	9.3	5.7	0.2	3.6		
	Mangium	5.4	4.9	0.9	0.8	18	6	3	1	0.1	2		
	Neem	4.6	2.8	0.8	0.5	30	10.5	5	1.8	0.3	3.2		
	Sanachakunda	6.6	5.3	1.5	1.2	27.7	16.3	5.8	3.4	0.3	2.4		
	Simaruba	3.9	2.1	0.8	0.4	18.6	10.4	3.9	2.2	0.4	1.7		
	Sishoo	3.3	2.1	0.6	0.4	12	6.5	2	1.1	0.2	0.9		
	Teak	4.3	2.7	0.8	0.5	16.7	10	2.9	1.8	0.3	1.1		
	Total	4.8	3.5	1	0.7	21.2	12.5	4.3	2.6	0.3	1.7	High	High
Block plantation AJY	Amla	3.2	2.6	1.1	0.9	10	8	3.3	2.7	0.2	0.6		
	Badachakunda	1.6	1	0.5	0.3	10	7	3.3	2.3	0.2	1		
	Bahada	1.9	1	0.6	0.3	7	5	2.3	1.7	0.3	0.6		
	Bamboo	2.6	1.8	0.9	0.6			0	0	0.3	0		
	Jamu	1.4	1	0.5	0.3	9	4	3	1.3	0.2	1.7		
	Karanja	2.6	1.8	0.9	0.6	10	8	3.3	2.7	0.3	0.6		
	Teak	2.8	1.9	0.9	0.6	13	9	4.3	3	0.3	1.3		
	Total	2.3	1.6	0.8	0.5	9.8	6.8	2.8	2	0.3	0.8	High	High





Type of Plantation	Type of trees	Average of Max Height in Metre	Average of Min Height in Metre	Average of MAX HEIGHT PER YEAR	Average of MIN HEIGHT PER YEAR	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average of MAX GBH/ GCH PER YEAR	Average of MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ GCH/ year & Ave Minimum GBH/ GCH/ Year	Height Performance (High < or =0.5, Medium >0.5 or =1, Low >1,)	GBH/GCH Performance (High < or =3.0, Medium >3.0 or =5, Low >5, )
Block Plantation (MWS)	Chatiyana	3.6		0.5	0	30		3.8	0	0.5	3.8		
	Simaruba	6	4.1	0.8	0.5	35.5	24.5	4.4	3.1	0.3	1.3		
	Teak	4.8	3.7	0.6	0.5	44.5	13	5.6	1.6	0.1	4		
	Total	5	3.9	0.6	0.4	38	18.8	4.8	1.9	0.2	2.9	High	High
CA Block Plantation	Bamboo	1.3	1	0.4	0.3			0	0	0.1	0		
	Chatiyana	3.1	1.5	1	0.5	28	9	9.3	3	0.5	6.3		
	Gambhari	1.3	0.9	0.4	0.3	8		2.7	0	0.1	2.7		
	Karanja	2.5	1.7	0.8	0.6	11.3	9	3.8	3	0.2	0.8		
	Neem	2.7	2.2	0.7	0.6	11.3	8	3.3	2.3	0.1	1		
	Sanachakunda	1.9	1.4	0.6	0.5	21	12	2.3	1.3	0.1	1		
	Simaruba	2.8	1.7	0.6	0.4	12.8	10.5	3.5	1.3	0.2	2.2		
	Sirisa	1	0.8	0.3	0.3	9		3	0	0	3		
	Sishoo	1.3	0.9	0.4	0.3	9	6	3	2	0.1	1		
	Teak	6	3	0.7	0.3	17	9	1.9	1	0.4	0.9		
	Total	2.4	1.6	0.6	0.4	13.1	8.9	3.1	1.6	0.2	1.5	High	High



Type of Plantation	Type of trees	Average of Max Height in Metre	Average of Min Height in Metre	Average of MAX HEIGHT PER YEAR	Average of MIN HEIGHT PER YEAR	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average of MAX GBH/ GCH PER YEAR	Average of MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ GCH/ year & Ave Minimum GHG/ Year	Height Performance (High < or =0.5, Medium >0.5 or =1, Low >1,)	GBH/GCH Performance (High < or =3.0, Medium >3.0 or =5, Low >5, )
CA Safety Zone Plantation	Karanja	3.7	3.1	0.6	0.5	14	0.8	2.3	0.1	0.1	2.2		
	Sanachakunda	6.1	3.6	1	0.6	19	6	3.2	1	0.4	2.2		
	Simaruba	3.3	2.5	0.6	0.4	11	6	1.8	1	0.2	0.8		
	Total	4.4	3.1	0.7	0.5	14.7	4.3	2.4	0.7	0.2	1.7		
PCA ANR with gap Plantation	Amla	0.5		0.2	0			0	0	0.2	0		
	Neem	1.9	1.5	0.6	0.5	6	5	2	1.7	0.1	0.3		
	Simaruba	2.6	1.8	0.9	0.6	9.3	6.3	3.1	2.1	0.3	1		
	Sishoo	1.5	1.1	0.5	0.4	7	5	2.3	1.1	0.1	1.2		
	Teak	1.1	0.7	0.4	0.2	7.3		1.8	0	0.2	1.8		
	Total	1.6	1.2	0.5	0.4	7.5	5.6	2.1	1	0.1	1.1	High	High





## 9.4 ANR Plantation

For the purpose of assessing the performance of ANR plantations, 13 sample sites covering ANR with gap plantation, ANR without gap plantation, CA ANR With gap and PCA ANR with gap are covered. Altogether 57 plots consisting of 1000 square metres each are considered for assessment of different parameters of ANR sites. The average area of ANR sites is 175.6 hectares. The average area for CA-ANR with gap plantation is about 300 hectares followed by ANR with gap plantation at 165.4 hectares, PCA- ANR with gap plantation at 89 hectares and ANR without gap -AJY at 51.3 hectares. Table 9.8 also reveals that that average area of the site under ANR plantation stands maximum at Sundargarh district followed Keonjhar and Rourkela districts.

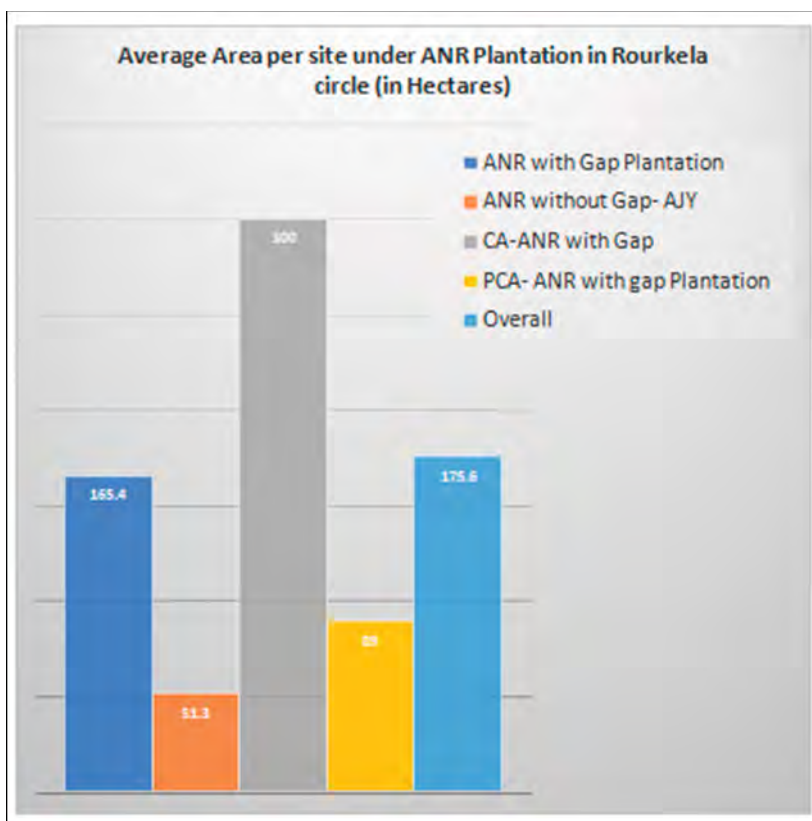


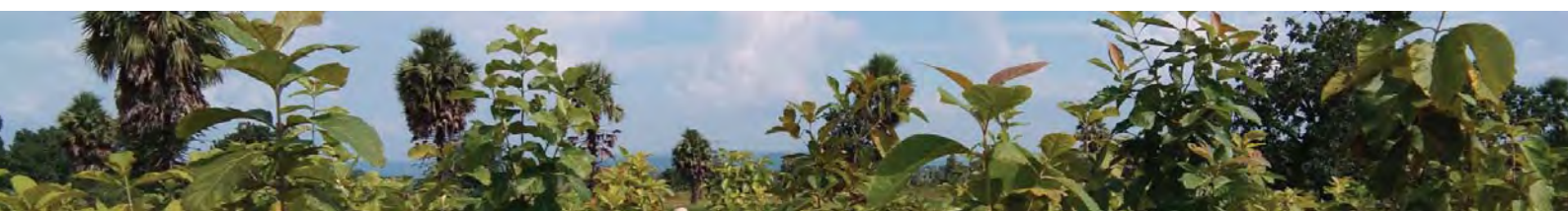
Figure 9.4: Average area per site under ANR Plantation in Rourkela circle (in hectares)

Table 9.8: Sample coverage of ANR Plantation

S I. No	Division	No of Sites	No of Plots	Average area per site (Hectares)				Overall ANR Plantation (Hect.)	Type of tree species regenerated
				ANR with Gap Plantation	ANR without Gap- AJY	CA-ANR with Gap	PCA- ANR with gap Plantation		
1	Bonei	3	6	83.3	50		89	83.3	Rohini, Karda, Sal, Asana, Sidha, Bheru, Chara, Kendu, Mahula, Dhatuki, Kurei, Amla, Bheru
2	Deogarh	2	10	92.0	54			92.0	
3	Keonjhar	4	16	219.3	50			219.3	
4	Rourkela	1	10	175.0				175.0	
5	Sundargarh	3	15	183.3		300		222.2	
	All Divisions	13	57	165.4	51.3	300	89	175.6	

### 9.4.1 Survival and Casualty

Plant survival and casualty of ANR with gap plantation activities as summarized in the following table reveals that overall, there are 186 surviving trees per 200 trees planted. The same is found at 173 and 187 for CA ANR with gap plantation and PCA ANR with gap plantation respectively. The survival and casualty



performance for ANR with gap plantation is found at 93.0 percent and 7.0 percent respectively. The casualty performance for CA ANR with gap plantation and PCA ANR with gap plantation is found at 14.0 and 6.0 percent respectively. The performance of all types of ANR plantations as mentioned in table 9.9, on the basis of casualty performance is found high.

*Table 9.9: Plantation Performance by casualty*

Type of Plantation	Division	Average No. of surviving trees/ Plot	Average no of casualties of trees/ Plot	Total no. of trees/ Plot	Total No of surviving tress per 200 trees planted	Total No. of trees casualty per 200 trees	Survival (%)	Survival based Plantation Performance (High, > or = 90 percent, Medium <90 to > or= 80 percent, Low<80 percent)
ANR with Gap Plantation	Bonei	109	7	116	188	9	94	High
	Deogarh	109	4	113	193	4	96	High
	Keonjhar	129	14	143	180	18	90	High
	Rourkela	117	8	125	187	10	94	High
	Sundargarh	127	12	139	183	15	91	High
		118	9	127	186	12	93	High
CA ANR with Gap Plantation	Sundargarh	113	18	131	173	23	86	Medium
PCA ANR with gap Plantation	Bonei	88	7	94	187	8	94	High

#### 9.4.2 Canopy Performance of ANR Plantation

The plantation performance on the basis of canopy coverage is as per the following table 9.10. The overall canopy coverage considering all the years and all divisions is found at 61.2 percent. Considering all plantation years, the canopy coverage for ANR with gap plantations stands maximum at Sundargarh division followed by Bonei and Keonjhar divisions. The plantation performance on the basis of canopy performance reveals that overall performance of ANR plantation on the basis of canopy performance is 'medium'. However, it is found 'low' in all divisions

*Table 9.10: Plantation performance on the basis of canopy performance*

Sl.	Type of ANR Plantation	Years	Bonei	Deogarh	Keonjhar	Rourkela	Sundargarh	All Divisions
1	ANR with Gap Plantation	2013-14		20.0	40.0			36.7
		2014-15	60.0			35.0	40.0	42.9
		2015-16		20.0	51.8	60.0	40.0	45.0
		2016-17	45.0	30.0				35.0
		Total	55.0	24.0	48.1	47.5	40.0	42.4
2	CA ANR with Gap Plantation	2014-15					55.0	55.0





Sl.	Type of ANR Plantation	Years	Bonei	Deogarh	Keonjhar	Rourkela	Sundargarh	All Divisions
3	PCA ANR with gap Plantation	2016-17	20.0					20.0
	Overall		43.3	24.0	32.1	23.8	45.0	61.2
	Plantation Performance by Canopy performance (High, > or= 70 percent, Medium <70 or > and =50 percent, Low <50 percent)		Low	Low	Low	Low	Low	Medium

#### 9.4.3 Height and GBH/GCH Performance

Overall height and GBH/GCH performance considering all ANR with gap plantations across forest divisions in Rourkela circle are found at 0.4 metre and 1.4 CMs respectively. By fixing Height and GBH/GCH based performance criteria, the performance of ANR with gap plantation with respect to height and GBH/GCH is found high.



Table 9.11: Height and GBH/GCH Performance

Type of Plantation	Type of trees	Average of Max Height in Metre	Average of Min Height in Metre	Average of MAX HEIGHT PER YEAR	Average of MIN HEIGHT PER YEAR	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average of MAX GBH/ GCH PER YEAR	Average of MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ year & Ave Minimum GBH/ Year	Height Performance (High < or =0.5, Medium >0.5 or =1, Low >1,)	GBH/ GCH Performance (High < or =3.0, Medium >3.0 or =5, Low >5,)
ANR with Gap Plantation	Acacia	4	2.5	0.9	0.6	15	9.6	3.4	2	0.3	1.4	High	High
	Amla	2.4	1.3	0.4	0.3	9.3	5.3	1.2	0.5	0.1	0.7	High	High
	Arjun	2.8	1.8	0.7	0.5	17	10	2.8	1.7	0.2	1.1	High	High
	Badachakunda	2.8	1.7	0.5	0.3	9.4	5.9	1.8	1.1	0.2	0.7	High	High
	Bamboo	3.3	2.4	0.7	0.5			0	0	0.2	0	High	High
	Bela	3.3	2.1	0.7	0.2	12	10	2.4	1	0.5	1.4	High	High
	Chatiyana	3.5	2.3	0.9	0.6	17.4	9.8	4.4	2.5	0.3	1.9	High	High
	Gambhari	2	1.3	0.4	0.2	10.6	7.3	2.3	1.3	0.2	1	High	High
	Kanchan	3.7	2.5	0.7	0.5	11	8	2.2	1.6	0.2	0.6	High	High
	Karanja	6	1.8	1.8	0.4	9.9	6.9	2.2	1.4	1.4	0.8	Low	High
	Khaira	4.1	2.8	0.8	0.4	8.5	7	1.7	1.1	0.4	0.6	High	High
	Mahaneem	4.2	3.1	0.9	0.6	18.9	9.1	4.1	1.8	0.3	2.3	High	High
	Mangium	4.8	3.4	1.2	0.8	17.1	7.7	4.3	1.9	0.4	2.4	High	High
	Neem	3.3	2.1	0.9	0.6	8.4	5.5	2.3	1.3	0.3	1	High	High
	Sanachakunda	3.7	2.1	0.7	0.4	10.3	8.4	2.1	1.6	0.3	0.5	High	High
	Simaruba	3.1	2.8	0.7	0.5	11.7	7	2.5	1.3	0.2	1.2	High	High
	Sirisa	1.7	0.9	0.3	0.2	8.6	6.3	1.7	0.8	0.1	0.9	High	High
	Sishoo	3.6	2.4	1	0.6	10.7	7.4	2.7	1.8	0.4	0.9	High	High
	Teak	6.9	2.3	2	0.6	12.4	7.3	2.9	1.7	1.4	1.2	Low	High
	Total	4.4	2.2	1.1	0.5	12	7.6	2.4	1.4	0.6	1	High	High





Type of Plantation	Type of trees	Average of Max Height in Metre	Average of Min Height in Metre	Average of MAX HEIGHT PER YEAR	Average of Min GBH/ GCH in cm	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH PER YEAR	Average of MAX GBH/ GCH PER YEAR	Average of MIN GBH/ GCH PER YEAR	Diff between Av Max Height/ year & Ave Minimum height / Year	Diff between Av Max GBH/ year & Ave Minimum GHH/ Year	Height Performance (High < or =0.5, Medium >0.5 or =1, Low >1,)	GBH/ GCH Performance (High < or =3.0, Medium >3.0 or =5, Low >5,)
CA ANR with Gap Plantation	Acacia	5.6	4.5	1.1	0.9	23.4	17.2	4.7	3.4	0.2	1.3	High	High
	Bamboo	4.8	4	1	0.8			0	0	0.2	0	High	High
	Sanachakunda	5.5	3.6	1.1	0.7	24.3	17.3	4.9	3.5	0.4	1.4	High	High
	Teak	6.4	4.3	1.3	0.9	30	22.6	6	4.5	0.4	1.5	High	High
	Total	5.7	4.2	1.1	0.8	26.2	19.3	4.5	3.3	0.3	1.2	High	High
PCA ANR with gap Plantation	Amla	0.5		0.2	0			0	0	0.2	0	High	High
	Neem	1.9	1.5	0.6	0.5	6	5	2	1.7	0.1	0.3	High	High
	Simaruba	2.6	1.8	0.9	0.6	9.3	6.3	3.1	2.1	0.3	1	High	High
	Sishoo	1.5	1.1	0.5	0.4	7	5	2.3	1.1	0.1	1.2	High	High
	Teak	1.1	0.7	0.4	0.2	7.3		1.8	0	0.2	1.8	High	High
All Plantation sites	Total	1.6	1.2	0.5	0.4	7.5	5.6	2.1	1	0.1	1.1	High	High
		3.9	2.5	0.9	0.6	15.2	10.8	3.0	1.9	0.3	1.1	High	High





#### 9.4.4 ANR without gap Plantation

ANR without gap interventions include SSO activities at the site. The type of activities include thinning, pruning and high stumps cutting. In Rourkela circle, the ANR without gap sites are considered in Bonei, Deogarh and Keonjhar forest divisions. The performance of the sites on the basis of canopy performance reveals that the performance of Deogarh and Keonjhar divisions is 'high' and for Bonei division, it is 'medium'

Table 9.12: No of sites, Plots and Average area/ Site for ANR with Gap Plantations

Type of Plantation	Details ANR without gap plantation sites					
	Bonei	Deogarh	Keonjhar	Rourkela	Sundargarh	Grand Total
No of sites	1	1	1	--	-	
No of Plots	2.0	2.0	2.0			6.0
Average Area (Hectares)	50.0	54.0	50.0			51.3
Canopy Performance (% of Area)	60.0	72.5	75.0			70.0
Plantation Performance by Canopy performance (High, > or= 70 percent, Medium <70 or > and =50 percent, Low <50 percent)	Medium	High	High	-	-	

### 9.5 Subsidiary Silvicultural Operations (SSOs)

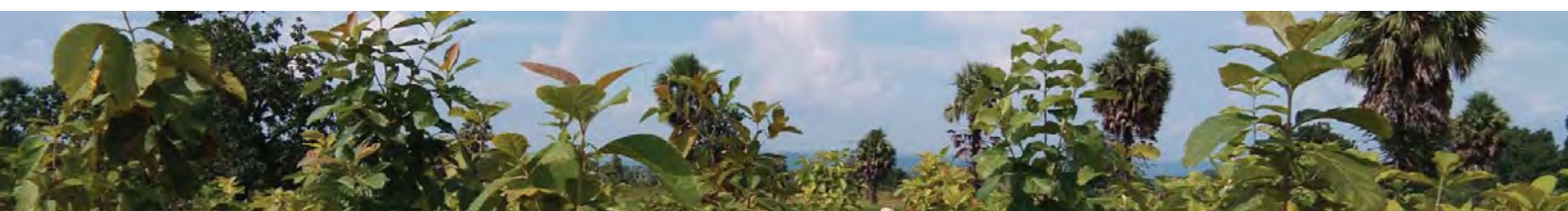
With the objective of assessing SSO performance, 20 plots under four sample sites of SSO- Bamboo operations at Bonei, Deogarh, Rourkela and Sundargarh are examined. On an average five plots per site are examined. Overall, the average area for bamboo plantation is about 1115.9 hectares.

#### 9.5.1 Canopy Performance

The average canopy percentages vary in the range of 45.0 percent at Bonei division and 90.0 percent in Deogarh division. The performance of SSO bamboo plantation on the basis of canopy performance is overall found 'medium' as against it is 'high' in Deogarh division, 'medium' in Sundargarh division and 'low' in Bonei and Rourkela divisions.

Table 9.13: Sample Coverage of SSO- Bamboo activities.

Division	No of sites	No of Plots	Average of Area of the site (Ha)	Average of Canopy %	Plantation performance on the basis of canopy Performance (High, > or= 70 percent, Medium <70 or > and =50 percent, Low <50 percent)
Bonei	1	5	500.00	45.0	Low
Deogarh	1	5	2000.00	90.0	High
Rourkela	1	5	562.06	40.0	Low
Sundargarh	1	5	1401.46	60.0	Medium
<b>Total</b>	<b>4</b>	<b>20</b>	<b>1115.9</b>	<b>58.8</b>	<b>Medium</b>



### 9.5.2 Survival and Casualty performance of SSO Bamboo

On an average, considering all divisions, there are 92 surviving clumps and 7 damaged clumps are found per hectare of forest area. Altogether there are 99 clumps found per hectare forest area. The survival of clumps varies between 88 to 98 percent in all the sites visited. Consequently, causality behaviour is noted in the range of 2 to 12 percent. The performance of SSO bamboo on the basis of survival performance criteria as mentioned in table 9.14 indicates 'high' for all bamboo SSO sites in all of the reporting divisions except Rourkela division.

*Table 9.14: Survival and Casualty performance of SSO- Bamboo Plantation (Per Hectare of Plantation Area)*

Divisions	Clumps found/ Hectare	Clumps damaged/ Hectare	Total	Survival (%)	Survival based Plantation Performance (High, < or = 90 percent, Medium <90 to > or= 80 percent, Low>80 percent)
Bonei	82	2	84	98	High
Deogarh	84	6	90	93	High
Rourkela	88	12	100	88	Medium
Sundargarh	114	6	120	95	High
All Divisions	92	7	99	93	High

### 9.5.3 Clumps and Culms Performance

Considering all sites in all forest divisions, it is found that number of culms is positively linked with time. There are 344 first year culms per hectare of forest area which increased to 600 culms in second year and beyond second year it increased to 1067 culms. The total culms performance for Sundargarh division is found highest at 4004 culms per hectare of forest area.

*Table 9.15: Clumps and culms performance in SSO bamboo forests (Per Hectare of forest Area)*

Row Labels	Average of 1st year culms	Average of 2nd year culm	Average of more than 2 years	Total
Bonei	244	426	642	1312
Deogarh	436	100	612	1148
Rourkela	288	532	758	1578
Sundargarh	408	1342	2254	4004
Grand Total	344	600	1067	2011

## 9.6 CRM- Old Teak Management Plantation

As a part of CRM activities, management of old teak plantations are found in Rourkela circle. Three sample sites each in Bonei, Deogarh and Sundargarh divisions are considered to assess the performance of old teak management plantation. As it can be seen from the following table, there are 610 surviving trees found per hectare of plantation area and casualty of trees could not be traced because of the nature of old plantations. However, canopy performance is found 'high' because in all of the site average canopy (%) is more than 70 percent.



Table 9.16: Performance of Old teak Management Plantations

Divisions	Bonei	Deogarh	Sundargarh	Total
Number of Sites	1	1	1	3
Number of Plots	5.0	2.0	1.0	8.0
Average area/ Site (Hectares)	99.3	30.0	10.0	70.8
Average Number of trees found per hectare of forest are	530	800	580	610
Canopy Performance (%)	80.0	80.0	70.0	78.8
Plantation performance on the basis of canopy Performance (High, > or= 70 percent, Medium <70 or > and =50 percent, Low <50 percent)	High	High	High	High

### 10.6.1 Height Performance

The plantation performance on the basis of height performance indicates that overall plantation performance of CRM-old teak management is medium. The performance of Bonei, Deogarh and Sundargarh is found 'high', 'medium' and 'high' respectively.

Table 9.17: Height based Performance of Old Teak Management Plantation.

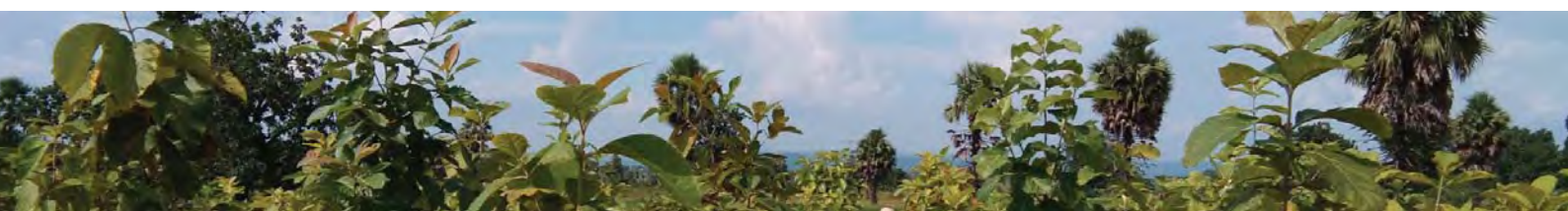
Divisions	Year of Plantation	Average Max Height (in Metre)	Average of Min Height in Metre	Average Max Height / Year	Average Min Height / Year	Difference of Max Height / Year and Average Min Height / Year	Height Performance (High < or =0.5, Medium >0.5 or =1, Low >1,)
Bonei	2013-14	31.2	28.2	3.9	3.5	0.4	High
Deogarh	2016-17	6.2	4.5	2.1	1.5	0.6	Medium
Sundargarh	2012-13	9.0	7.0	1.0	0.8	0.2	High
Total		22.2	19.6	2.1	1.5	0.6	Medium

### 9.6.2 GBH/GCH Performance

The performance of old teak management on the basis of GBH/GCH criteria, overall, it is found 'medium'. For Sundargarh district, the performance is found 'high' and for Bonei and Deogarh divisions, it is found 'low'.

Table 9.18: GBH/GCH based Performance of Old Teak Management Plantation.

Divisions	Years	Average Max GBH/ GCH in cm	Average Min GBH/ GCH in cm	Average Max GBH/ GCH/ Year	Average Min GBH/ GCH/ Year	Difference of Average Max GBH/ GCH/ Year & Average Min GBH/ GCH/Year	Plantation performance on the basis of GBH/ GCH Criteria (High < or =3.0 , Medium > 3.0 or =5, Low >5,)
Sundargarh	2012-13	32	22	4.0	2.8	1.3	High
Bonei	2013-14	154.2	101.8	22.0	14.5	7.5	Low
Deogarh	2016-17	46.5	16.5	11.6	4.1	7.5	Low
	<b>Total</b>	<b>112</b>	<b>70.5</b>	<b>12.2</b>	<b>7.4</b>	<b>4.9</b>	<b>Medium</b>

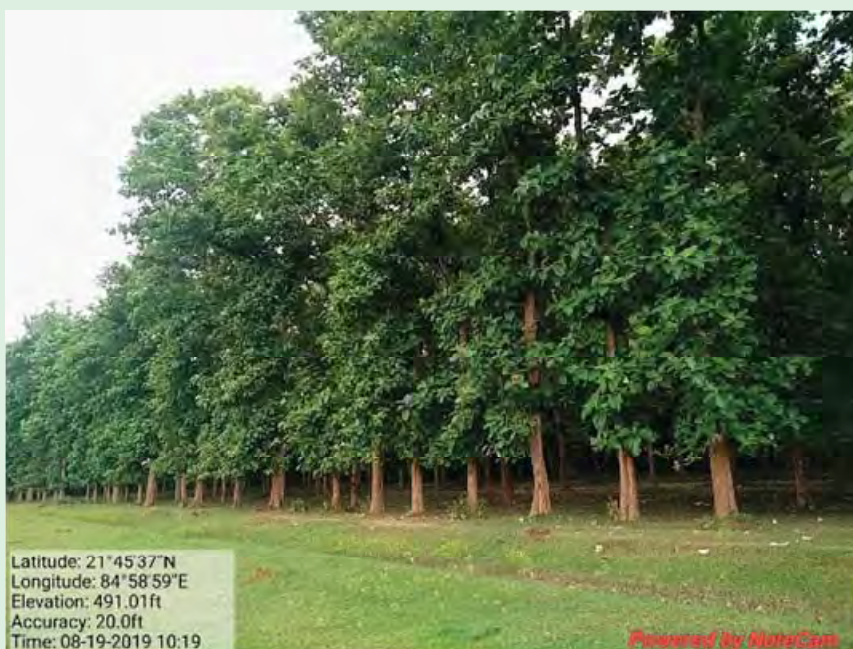




## Case Study: Management of Old Teak Plantation

Circle- Rourkela, Range- Bonei, Section - Bonei, Beat - Badposh, RF - Jankinagar, Lat / Long - 21° 45' 20.64" N / 84° 59' 12.96" E

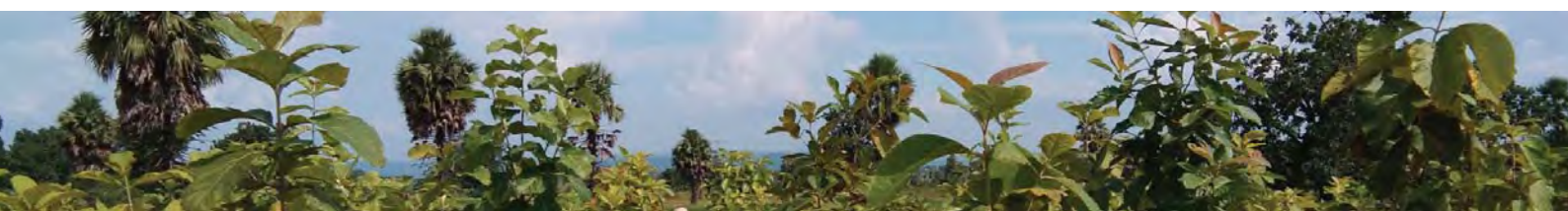
The Teak plants have been widely planted throughout the tropics to produce high quality of timber. Many factors affect the success of plantation like site, seed supply and seed quality, management and other biological factors such as insects etc. Plantation site is the primary factor influencing the growth and development. With the precise site selection, growth and yield can be improved more than cent percent. Silvicultural operation



of teak plantation practices like weeding, thinning and fire protection is essential for growth.

During 1972-73 the teak plantation has been done in the Bonei Division and the same site has been taken up under Old Teak Management Practices of CAMPA APO 2013-14 in Jakeikana RF about 99.03 hectare. The VSS members and Department both of them were looking after the teak site for better growth and protection. Since long time the VSS is managing the plantation under the guidance of department and the growth preformance of the teak plantation observed better.

Presently the villagers of "Jakeikana" were able to get the dry wood log and thinning branches from this site for some occasion with prior permission of VSS members and department. VSS members were also involved in the maintenance and protection of the teak plantation. Due to the CAMPA intervention and support from the villagers the teak plantation site become the second most successful site in Odisha as reported by the department officials. As the site has been under intensive care the growth of the teak trees is remarkably high i.e. height 70 to 100 ft. and girth 60 to 70 cm. Naturally regeneration of teak has also been observed which indicates the good maintenance of the site. Department also collect the regenerating seedlings and planting it in nursery bed to produce good number of teak saplings which can be used for plantation purpose.



## 9.7 Soil and Moisture Conservation Works

### 9.7.1 Number of SMC Structures at Plantation Sites

Normally under CAMPA intervention in all plantation related activities at intervention site level, a number of SMC structures are taken up. However, about there are no SMC structures found in about 13.8 percent of the sites visited by the study team. Majority of plantation sites about 55.4 percent of the sites have two types of SMC structures. Proportionately 16.2 percent of the sites have two SMC structures and 14.6 percent of the structures have more than two SMC structures on plantation sites. In the case of bald hill plantations, for all of the sampled-out sites two types of SMCs are evidenced. For all of the SSO bamboo plantation sites, two types of SMCs are found.

*Table 9.19: Type of Plantation Activities and SMC works.*

Sl.	Type of Plantation	Divisions	% of Plantations sites having number of SMC structures				
			0	1	2	>2	Total
1	ANR with Gap Plantation	Bonei	0.0	0.0	100.0	0.0	100.0
		Deogarh	0.0	10.0	40.0	50.0	100.0
		Keonjhar	0.0	31.3	37.5	31.3	100.0
		Rourkela	0.0	0.0	100.0	0.0	100.0
		Sundargarh	0.0	0.0	100.0	0.0	100.0
		Total	0.0	10.5	71.9	17.5	100.0
2	ANR without Gap AJY	Bonei	50.0	0.0	50.0	0.0	100.0
		Deogarh	50.0	0.0	50.0	0.0	100.0
		Keonjhar	50.0	0.0	50.0	0.0	100.0
		Total	50.0	0.0	50.0	0.0	100.0
3	Baldhill Plantation	Keonjhar	0.0	0.0	100.0	0.0	100.0
		Rourkela	0.0	0.0	100.0	0.0	100.0
		Sundargarh	0.0	0.0	100.0	0.0	100.0
		Total	0.0	0.0	100.0	0.0	100.0
4	Bamboo plantation	Bonei	0.0	100.0	0.0	0.0	100.0
5	Block Plantation	Bonei	80.0	20.0	0.0	0.0	100.0
		Deogarh	0.0	100.0	0.0	0.0	100.0
		Keonjhar	100.0	0.0	0.0	0.0	100.0
		Rourkela	100.0	0.0	0.0	0.0	100.0
		Total	53.8	46.2	0.0	0.0	100.0
5	Block plantation AJY	Rourkela	0.0	0.0	100.0	0.0	100.0
6	Block Plantation (MWS)	Rourkela	100.0	0.0	0.0	0.0	100.0
7	CA ANR with Gap Plantation	Sundargarh	0.0	0.0	0.0	100.0	100.0
8	CA Block Plantation	Deogarh	0.0	100.0	0.0	0.0	100.0





Sl.	Type of Plantation	Divisions	% of Plantations sites having number of SMC structures				
			0	1	2	>2	Total
		Keonjhar	0.0	0.0	100.0	0.0	100.0
		Rourkela	0.0	0.0	100.0	0.0	100.0
9	CA Safety Zone Plantation	Keonjhar	100.0	0.0	0.0	0.0	100.0
10	Old Teak Management	Bonei	100.0	0.0	0.0	0.0	100.0
		Deogarh	0.0	100.0	0.0	0.0	100.0
		Sundargarh	0.0	0.0	100.0	0.0	100.0
		Total	62.5	25.0	12.5	0.0	100.0
11	PCA ANR with gap Plantation	Bonei	0.0	0.0	0.0	100.0	100.0
12	SSO Bamboo	Bonei	0.0	0.0	100.0	0.0	100.0
		Deogarh	0.0	0.0	100.0	0.0	100.0
		Rourkela	0.0	0.0	100.0	0.0	100.0
		Sundargarh	0.0	0.0	100.0	0.0	100.0
		Total	0.0	0.0	100.0	0.0	100.0
		Overall	13.8	16.2	55.4	14.6	100.0

### 9.7.2 Type of SMC Structures

Staggered trenches, Half-moon trenches, LBCD, stone packing and percolation pits are different type of SMC structures were witnessed by the study team in all of the plantation sites except a very few like block plantations in Keonjhar and Rourkela; CA city zone safety zone management in Keonjhar and old teak management in Bonei. Half-moon trenches as well as stone packing are noticed in all of the bamboo plantation (SSO) sites. Staggered trenches are found in all ANR with gap plantation, bald-hill plantation, CA block plantation sites along with other types of SMC structures.





Table 9.20: Type of SMC works

Sl.	Type of Plantations	Divisions	% of Plantation sites					Total
			Staggered Trenches	Half-moon Trenches	LBCD	Stone Packing	Percolation Pits	
1	ANR with Gap Plantation	Bonei	100.0	0.0	100.0	0.0	0.0	100.0
		Deogarh	100.0	0.0	90.0	0.0	50.0	100.0
		Keonjhar	100.0	0.0	68.8	0.0	31.3	100.0
		Rourkela	100.0	0.0	100.0	0.0	0.0	100.0
		Sundargarh	100.0	0.0	100.0	0.0	0.0	100.0
		Total	100.0	0.0	89.5	0.0	17.5	100.0
2	ANR without Gap AJY	Bonei	50.0	0.0	50.0	0.0	0.0	100.0
		Deogarh	50.0	0.0	50.0	0.0	0.0	100.0
		Keonjhar	50.0	0.0	50.0	0.0	0.0	100.0
		Total	50.0	0.0	50.0	0.0	0.0	100.0
3	Baldhill Plantation	Keonjhar	100.0	100.0	0.0	0.0	0.0	100.0
		Rourkela	100.0	0.0	100.0	0.0	0.0	100.0
		Sundargarh	100.0	100.0	0.0	0.0	0.0	100.0
		Total	100.0	50.0	50.0	0.0	0.0	100.0
4	Bamboo plantation	Bonei	0.0	100.0	0.0	0.0	0.0	100.0
5	Block Plantation	Bonei	20.0	0.0	0.0	0.0	0.0	100.0
		Deogarh	100.0	0.0	0.0	0.0	0.0	100.0
		Keonjhar	0.0	0.0	0.0	0.0	0.0	100.0
		Rourkela	0.0	0.0	0.0	0.0	0.0	100.0
		Total	46.2	0.0	0.0	0.0	0.0	100.0
6	Block plantation AJY	Rourkela	100.0	0.0	100.0	0.0	0.0	100.0
7	Block Plantation (MWS)	Rourkela	0.0	0.0	0.0	0.0	0.0	100.0
8	CA ANR with Gap Plantation	Sundargarh	100.0	0.0	100.0	0.0	100.0	100.0
9	CA Block Plantation	Deogarh	100.0	0.0	0.0	0.0	0.0	100.0
		Keonjhar	100.0	0.0	100.0	0.0	0.0	100.0
		Rourkela	100.0	100.0	0.0	0.0	0.0	100.0
		Total	100.0	25.0	25.0	0.0	0.0	100.0
10	CA Safety Zone Plantation	Keonjhar	0.0	0.0	0.0	0.0	0.0	100.0
11	Old Teak Management	Bonei	0.0	0.0	0.0	0.0	0.0	100.0
		Deogarh	0.0	0.0	100.0	0.0	0.0	100.0
		Sundargarh	100.0	0.0	100.0	0.0	0.0	100.0
		Total	12.5	0.0	37.5	0.0	0.0	100.0



Sl.	Type of Plantations	Divisions	% of Plantation sites					Total
			Staggered Trenches	Half-moon Trenches	LBCD	Stone Packing	Percolation Pits	
12	PCA ANR with gap Plantation	Bonei	100.0	0.0	100.0	0.0	100.0	100.0
13	SSO Bamboo	Bonei	0.0	100.0		100.0	0.0	100.0
		Deogarh	0.0	100.0		100.0	0.0	100.0
		Rourkela	0.0	100.0		100.0	0.0	100.0
		Sundargarh	0.0	100.0		100.0	0.0	100.0
		Total	0.0	100.0		100.0	0.0	100.0
		<b>Overall</b>	<b>65.4</b>	<b>21.5</b>		<b>15.4</b>	<b>14.6</b>	<b>100.0</b>

### 9.7.3 Extent of Siltation

Considering the basic objective of SMC structures as soil and moisture, the extent of siltation of different type of SMC structures under different plantation conditions is assessed. Overall, it is found that there is 34.1 percent deposition of silts on SMC structures. The average extent of siltation for two and more than two SMC structures on plantations sites has yielded marginally higher results at 36.2 and 37.1 percent respectively. The overall plantation performance on the basis of SMC performance in Rourkela circle is found 'medium'. For Bonei and Deogarh divisions, it is found 'low' and for the remaining divisions, it is observed 'medium'.

Table 9.21: Average extent of Siltation

Divisions	Average of Extent of Siltation (%) by number of SMC structure				Plantation performance on the basis of SMC performance (If siltation percentage is > or =50, High, <50 and > or= 30, Medium, <30, Low)
	One SMC structure	Two SMC structures	More than two SMC structures	Total	
Bonei	38.3	43.3	30.0	38.1	Medium
Deogarh	16.8	36.6	20.0	23.2	Low
Keonjhar	30.0	44.2	60.0	44.7	Medium
Rourkela		18.1		18.1	Low
Sundargarh		36.6		36.6	Medium
<b>Grand Total</b>	<b>27.1</b>	<b>36.2</b>	<b>37.1</b>	<b>34.1</b>	<b>Medium</b>

## 9.8 Overall Plantation Management

Delineated four hectares plantation sites generally maintained for ANR with gap plantation and for plantations where SSO activities are undertaken. On the basis of sample-based verification of different plantation-based activities, it is found that delineated four hectares sites are not maintained by any of the plantation sites. Overall, 72.3 percent of the sites maintain plantation journals. Plantation journals in Dundergarh division is found entirely partially maintained or non-maintained in all the plantation sites required for maintaining plantation journals. Micro plans are maintained by some 5.4 percent of the



plantation sites undertaking plantations under AJY. Treatment Maps are maintained by 21.5 percent of the plantation sites. Majority of plantation sites to the extent of 78.5 percent are found to have installed pillars around plantation sites. As per table 9.22, it is evident that out of the total pillars installed, about 97 percent of the pillars are either broken or damaged or shifted by miscreants for their personal uses.

*Table 9.22: Overall Plantation Management*

Divisions	% of plantation sites maintained								Status of Pillars at Plantation sites	
	Plantation Journal	Plantation Journal-fully maintained	Plantation Map	Micro Plan	Treatment Map	Plantation Register	Pillars at plantation sites	Sign Boards at Plantation sites	Average of No. of pillars installed/Plantation site	% of pillars witnessed
Bonei	62.5	62.5	78.1	6.3	37.5	31.3	100	65.6	60	11.9
Deogarh	57.7	61.5	73.1	7.7	30.8	34.6	100	76.9	49	10.5
Keonjhar	91.3	91.3	91.3	8.7	8.7	0.0	100	95.7	32	9.1
Rourkela	77.3	77.3	77.3	4.5	22.7	22.7	100	68.2	35	8.7
Sundargarh	77.8	0.0	77.8	0.0	3.7	22.2	100	77.8	96	20.0
Grand Total	72.3	56.9	79.2	5.4	21.5	23.1	100	76.2	56	12.6

## 9.9. Protection Measures

The various types of protection measures introduced under different plantation activities for all divisions is separately summarized as per the following table. It is found that watch and word is a common protection measure followed at majority of plantation sites. The plantation sites taken care of AJY is also protected by the respective local VSSs. Besides fire protection measures, Boundary walls in some cases are also noticed.

*Table 9.23: Plantation wise Protection Measures*

Type of Plantation	Type of Protection Measures	% of Plantation Sites by divisions adopting security Measures					
		Bonei	Deogarh	Keonjhar	Rourkela	Sundargarh	Grand Total
ANR with Gap Plantation	Fire line tracing	0.0	0.0	31.3	0.0	0.0	9.1
	No protection measures	100.0	0.0	6.3	0.0	66.7	27.3
	Watch & ward	0.0	10.0	0.0	0.0	0.0	1.8
	Watch and ward, 2 watchers deployed for watch and ward. Fire line creation to protect from forest fire.	0.0	90.0	62.5	100.0	33.3	61.8
	Total	100.0	100.0	100.0	100.0	100.0	100.0
ANR without Gap AJY	Watch & Ward	100.0					100.0





Type of Plantation	Type of Protection Measures	% of Plantation Sites by divisions adopting security Measures					
		Bonei	Deogarh	Keonjhar	Rourkela	Sundargarh	Grand Total
Baldhill Plantation	Local VSS is taking care of the site	100.0	100.0	100.0			100.0
Bamboo plantation	watch & ward					100.0	100.0
Block Plantation	Local VSS taking care of the plantation site	0.0		33.3	66.7		27.3
	No Protection Measures has taken now	100.0		0.0	0.0		45.5
	Watch & Ward	0.0		66.7	33.3		27.3
	Total	100.0		100.0	100.0		100.0
Block plantation AJY	Watch & Ward	100.0					100.0
Block Plantation (MWS)	Watch & Ward		100.0				100.0
CA ANR with Gap Plantation	Fire Line creation				100.0		100.0
CA Block Plantation	No protection measures			0.0	100.0	0.0	28.6
	Watch & ward			100.0	0.0	100.0	71.4
	Total			100.0	100.0	100.0	100.0
CA Safety Zone Plantation	Both side barbed wire fencing		2				2
Old Teak Management	Department has engaged watcher for watch and ward.	0.0		0.0	100.0		14.3
	No Protection measure	0.0		100.0	0.0		14.3
	Watch & ward	100.0		0.0	0.0		71.4
	Total	100.0		100.0	100.0		100.0
PCA ANR with gap Plantation	Watch & Ward					100.0	100.0
SSO Bamboo	No protection measures has been taken	0.0	100.0			0.0	28.6
	Watch & Ward	100.0	0.0			0.0	57.1
	Total	100.0	100.0			100.0	100.0



## 9.10 Major Fauna

*Table 9.24: Division wise major fauna reported*

Divisions	Major Fauna reported
Bonei	Elephant, Barking Deer, Bear, Jungle fowl, Rabbit, , Peacock, Snake, Jackal, Wild Boar, Leopard, Spotted deer, Fox, Porcupine
Deogarh	Barking Deer, Elephant, Porcupine, Wild Boar, Bear, Rabbit, Snake
Keonjhar	Bear, Barking Deer, Porcupine, Elephant, King Cobra, Spotted Deer, Monkey, Elephant, Rabbit, Wild Boar, Jackel
Rourkela	Deer, Barking Deer, Elephant, Bear, Rabbit, Peacock, Pangolin, Wild Boar
Sundargarh	Bear, Barking Deer, Elephant, Porcupine, Sambar, Wild Boar, Wild Dog

### Case Study: SOLAR FENCING A BARRICADE TO AVOID HUMAN-ANIMAL CONFLICT

**Circle - Rourkela, Division - Sundargarh, Range- Hemgiri, Section - Purna, Beat - Purna, Village - Purna, Behramunda, Badarampur, Khursi & Khajuribhal, Lat / Long - 21° 51' 56.43" N / 83° 38' 27.19" E**

Solar fencing system is a popular and sought-after system for protecting premises, agriculture area, restricting animals to enter villages, etc. Forest department also used to opt the solar fencing system to restrict animal human conflict. Sundargarh division has constructed a solar fencing of 20 Kms covering Purna, Behramunda, Badarampur, Khursi & Khajuribhal villages under CAMPA APO



2016-17. This solar fencing is one of the successful and well operated fences. The locals of stated village have also cooperated the forest department for proper functioning of the fence. Before installation of the solar fence, cases of human-animal conflict had occurred very frequently in the villages. But after this intervention, human-animal conflict cases have not been observed since last two years.



## 9.11 Key Observations and Impacts of the Plantation sites

Table 9.25: Key Observations and Impact of the Plantation

Sl.No	Plantation/ Division/ Range/ Section/ Beat	Observation	Impact of the Plantation
1	Old Teak Management / Deogarh/ Riamal /Rengalibeda / Budhideo	<ul style="list-style-type: none"> <li>Only LBCD has been done in the treatment area to increase soil moisture.</li> <li>During APO 2009-10 teak plantation is done at the site and management of teak is undertaken in APO 2016-17.</li> <li>Species like Bada chakunda, Bheru, Kurei, Neem, Sidha, Kendu were regenerated in teak management site.</li> <li>However, from 2016-17, silviculture &amp; SMC works are being carried out for soil moisture conservation and prevent erosion of top soil.</li> <li>Regeneration of teak also observed in the site along with other natural species.</li> </ul>	<ul style="list-style-type: none"> <li>Due to presence of LBCD the soil erosion has been checked.</li> <li>Due to teak management practice Green coverage of the area has increased.</li> </ul>
2	Old Teak Management/ Bonei/ Bonei/ Bonei/ Badposh	<ul style="list-style-type: none"> <li>Teak plantation has undertaken in the year of 1975 and now the growth of the teak is very well.</li> <li>No SMC work has been done at the site.</li> <li>Sal, Kurei &amp; bushes were observed. Some of the trees were damaged by lightening and thundering.</li> <li>During festival time local villagers collect the uprooted or dry logs by taking permission from the department and VSS members.</li> <li>Illicit felling was not observed.</li> <li>Regeneration of teak has also observed.</li> </ul>	<ul style="list-style-type: none"> <li>In 1975 the teak was planted and in 2013-14 the site was covered under Teak management scheme. Due to CAMPA intervention the growth of teak remarkable and average height varies from 80ft to 100ft.</li> <li>The regeneration of teak is also observed there and the growth of the newly regenerated plants is quite well.</li> </ul>
3	Old Teak Management/ Sundargarh/ Hemgiri/ Kanika/ Kanika	<ul style="list-style-type: none"> <li>Sal is a major dominating species followed by sidha, kuri, dhaura, karda, kendu etc.</li> <li>Protection of teak trees are done by forest department.</li> <li>SMC works like loose boulder structures are constructed.</li> <li>Weeding, cleaning, high stump cutting and SMC work has done in the site.</li> <li>Local people are dependent on forest produce and collect forest products for livelihood.</li> </ul>	<ul style="list-style-type: none"> <li>Due to maintenance works, soil moisture of the site has improved. It is reported that there has been a positive change in the wild animal population in the forest.</li> </ul>





Sl.No	Plantation/ Division/ Range/ Section/ Beat	Observation	Impact of the Plantation
4	ANR with Gap Plantation/ Deogarh/ Reiamal/ Rengalibeda/ Gundeipali	<ul style="list-style-type: none"> <li>Regeneration of Natural species like Rohini, Karda, Sal, Asana, Sidha, Bheru was observed. Sal is a dominated species there.</li> <li>Cleaning, high stump cutting, weeding was done.</li> <li>2.5 meter spacing was maintained</li> <li>Species diversity is observed in the plantation site.</li> </ul>	<ul style="list-style-type: none"> <li>Before plantation the area was degraded and some of the patches were total barren but after plantation the green coverage has increased</li> </ul>
5	ANR with Gap Plantation/ Deogarh/ Barkot/ Kalla/Sarankot	<ul style="list-style-type: none"> <li>Sal is a dominated species observed in the site.</li> <li>Silt deposit is high in the d/s of LBCD.</li> <li>Natural species like Sal, Chara, Kendu, Mahula, Sunari, Dhatuki, Sidha are observed and also regeneration of the same species found.</li> <li>Weeding, cleaning and high stump cutting was done. Coppices were regenerated from the stumps.</li> <li>Growth of the plants has not enough due to poor soil quality.</li> </ul>	<ul style="list-style-type: none"> <li>Due to plantation activity the green cover has increased in degraded patches of the site.</li> <li>Soil and moisture content of the site has increased due to SMC work.</li> </ul>
6	ANR without Gap AJY/ Deogarh/Barkot/ Dantaribahal/ Kurkunda	<ul style="list-style-type: none"> <li>Natural species like Amla, Sal, Mahula, Chara, Asana, Kendu, Sidha, bamboo etc were observed in the AJY forest patch</li> <li>Forest produce like Mahula, Sal leaves, Kendu leaves, Tola, Harida, Bahada are collected.</li> <li>15 numbers of LBCD has constructed in the site along with staggered trench and percolation pits.</li> </ul>	<ul style="list-style-type: none"> <li>Protection measures have been enhanced.</li> <li>Ground water level has recharged due to SMC activity.</li> <li>Watch &amp; ward helps for natural regeneration of species.</li> </ul>
7	ANR with Gap Plantation/ Deogarh/ Pallahara/ Pallahara/ Batisuan	<ul style="list-style-type: none"> <li>Species like Sal, Asana, Kurei, Sunari, Dhakuti, Amla, Khajuri, Kendu were observed.</li> <li>On an average 2 to 3 coppices were generated. Khajuri &amp; kendu regeneration are like bushes.</li> <li>Due to heavy water flow in the nallahs, LBCDS were in not in good shape. Siltation is high in the above of the LBCDS.</li> <li>Gully ploughing is constructed in site and observed to be in good condition.</li> <li>More LBCDs may be constructed to check soil erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Soil conservation measures have been beneficial in arresting top soil erosion.</li> </ul>



Sl.No	Plantation/ Division/ Range/ Section/ Beat	Observation	Impact of the Plantation
8	ANR with Gap Plantation/ Keonjhar/BJP/ Suakati/Suakati	<ul style="list-style-type: none"> <li>Sign Board was destroyed by elephant. It was helping for demarcation of the site.</li> <li>Biotic interference was observed. Weeds and other bushes were grown up there. Weeding and cleaning is required.</li> <li>Species like Sal, Mango, Kurei, Kendu, Mahula, Asana, Bahada, Sunari were observed there.</li> </ul>	<ul style="list-style-type: none"> <li>Before CAMPA intervention or plantation activity Podu cultivation (Shifting cultivation) were done by Bhuniya PTG. But after intervention no such activity performed.</li> </ul>
9	ANR with Gap Plantation/ Keonjhar/ Ghatagaon/ Ghatagaon/ Ghatagaon	<ul style="list-style-type: none"> <li>Species like Sal, Chara, Mahula, Kurei, Bhaliya, Karada are observed.</li> <li>Weeding, Cleaning, high stump cutting was done during 2016-17</li> <li>Kendu, Mahula, Char, Bhaliya etc are regenerated</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage of the site has increased.</li> <li>Naturally regeneration of species has increased due to SSO work.</li> <li>Soil erosion is controlled due to SMC work</li> </ul>
10	ANR with Gap Plantation/ Keonjhar/ Ghatagaon/ Ghatagaon/ Ghatagaon	<ul style="list-style-type: none"> <li>Sal is a major dominating species followed by Chara, Kendu, Mahula.</li> <li>Soil erosion was one of the major problems in the site so 70 LBCD are constructed within the 300 Ha. Plantation site.</li> <li>Fruit bearing species are planted in place of casualty.</li> <li>Renovation of staggered trench is required.</li> <li>Staggered trench was unevenly excavated.</li> <li>Naturally regeneration has been observed for species like Kendu, Mahula, Chara etc.</li> </ul>	<ul style="list-style-type: none"> <li>Soil erosion is controlled and green coverage has increased.</li> </ul>
11	ANR with Gap Plantation/ Keonjhar/ Ghatagaon/ Dhenkikote/ Dhenkikote	<ul style="list-style-type: none"> <li>Watch &amp; ward and protection measures are provided.</li> <li>Due to poor soil condition growth of plants are not good.</li> </ul>	<ul style="list-style-type: none"> <li>This site has come under CA of Roida Iron ore mines.</li> <li>The plantation has been done on the barren patch in block mode.</li> </ul>
12	ANR with Gap Plantation/ Bonei/Sole/ Mahuldihi/ Sirgida	<ul style="list-style-type: none"> <li>Naturally regeneration of species like Sal, Asan, Kendu, Bhaliya, Sidha, Char, Sunari were observed.</li> <li>Due to SMC work soil moisture condition has increased.</li> <li>Due to protection measures survivability and growth of the plants are good.</li> </ul>	<ul style="list-style-type: none"> <li>Forest fire control due to fire line creation.</li> <li>Control of illegal cutting of trees.</li> <li>Green coverage of the site has increased</li> </ul>



Sl.No	Plantation/ Division/ Range/ Section/ Beat	Observation	Impact of the Plantation
13	PCA ANR with gap Plantation/ Bonei/Tamda/ Bhaludunguri/ Bartengla	<ul style="list-style-type: none"> <li>Teak is the dominating species followed by Simaruba in the site.</li> <li>Fire protection activities are done with the help of local villagers.</li> <li>Villagers are dependent on kendu leaves which are abundantly available there. It enhanced their livelihood.</li> <li>Forest density is increased after intervention. Due to SMC work, moisture content is increased.</li> </ul>	<ul style="list-style-type: none"> <li>Due to SMC work ground water has increased in the nearby village.</li> <li>Forest density has increased.</li> </ul>
14	ANR with Gap Plantation/ Bonei/Bonei/ Tikayatpali/ Khajuribahal	<ul style="list-style-type: none"> <li>Natural species like Sal, Char, sidha, Asana, Kurai, khajuri, mahula, bija are observed there and also naturally regeneration of the species</li> <li>Weeding, Cleaning, high stump cutting are undertaken in the plantation area.</li> <li>Grass &amp; bushes are observed in the plantation area.</li> </ul>	<ul style="list-style-type: none"> <li>The villagers get benefited due to SMC works measures. It generates income for them.</li> <li>The soil erosion has been decreased.</li> </ul>
15	ANR with Gap Plantation/ Rourkela/ Bishra/ Khirtola/ Khirtola	<ul style="list-style-type: none"> <li>500-meter fire line has been created to protect the site from fire incidence.</li> <li>Sal is the main dominating species. Natural species like Neem, Kendu, Mahula, char are observed and also regeneration of the same has been observed</li> </ul>	<ul style="list-style-type: none"> <li>Forest fire incidence has been minimized in the site. Soil moisture condition is increased.</li> </ul>
16	ANR with Gap Plantation/ Rourkela/ Kunarmunda/ BadDalki/ Birda	<ul style="list-style-type: none"> <li>Total treatment area is 200ha and plantation is carried out in 45 ha (5 patches).</li> <li>390 LBCD and 1610 Staggered Trench were created.</li> <li>Erosion of soil has been minimised due to SMC work.</li> <li>Species like Kendu, Kurei, Salei, Sunari, Amla has been observed in the site. Along with bushes and herbs are also observed.</li> </ul>	<ul style="list-style-type: none"> <li>Soil moisture condition is increased.</li> <li>Green cover is increased significantly.</li> </ul>
17	ANR with Gap Plantation/ Sundargarh/ Gopalpur/ Gopalpur/ Tikinipada	<ul style="list-style-type: none"> <li>Growth of the plantation is affected due to growth of other species.</li> <li>Natural species like Asan, Sal, Rohini, Piasal, Kendu, Mahula, Sidha were observed in the site.</li> <li>Soil erosion is observed high in some of the sample plot for which growth and survival of the plants are affected.</li> <li>Growth of bamboo is observed comparatively higher than other species.</li> <li>Out of 150ha treatment area plantation activities are undertaken in 33.2ha only.</li> </ul>	<ul style="list-style-type: none"> <li>Bankibahal, Kuisera &amp; Mahisinadhepa villagers are dependent on forest produce like fire wood and brushwood for fuel purpose. Also, they collect minor forest produce like tooth stick, brushwood and natural log for different purpose. Availability of forest produce has increased.</li> </ul>





Sl.No	Plantation/ Division/ Range/ Section/ Beat	Observation	Impact of the Plantation
18	ANR with Gap Plantation/ Sundargarh/ Gopalpur/ Tihuria/Jamkani	<ul style="list-style-type: none"> <li>The plantation site is nearer to Chhattisgarh boarder area. Reserve pillar also used as demarcation of plantation boundary.</li> <li>Out of 300 ha. Plantation has done in 37.5 ha area only.</li> <li>In sample plot of 2 &amp; 3 mostly bamboo and teak has planted</li> <li>Natural species like Bheru, Sinha, Kendu, Asan has observed there.</li> </ul>	<ul style="list-style-type: none"> <li>Due to no biotic interference growth of bamboo and other species are good.</li> <li>Green coverage of the site has increased.</li> <li>Soil moisture has also increased.</li> </ul>
19	CA ANR with Gap Plantation/ Sundargarh/ Ujalpur/ Kindrikela/ Kinjirikela	<ul style="list-style-type: none"> <li>Teak is dominating species observed in the site.</li> <li>Weeding, Cleaning, High stump cutting were done in the site at the time of silviculture operation.</li> <li>Growth of the plantation is good.</li> <li>Natural species like Neem, Kendu, Char, has observed. Putush bushes also observed there</li> </ul>	<ul style="list-style-type: none"> <li>Soil moisture and green coverage of the site have increased.</li> </ul>
20	ANR with Gap Plantation/ Sundargarh/ Hemgiri/ Daghora/ Daghora	<ul style="list-style-type: none"> <li>Acacia is the major species followed by karanja.</li> <li>Sign board is broken by the elephant.</li> <li>Regeneration of species like Sal, Kurda, Char, Kendu, Mahula are observed.</li> <li>Soil moisture condition is increased.</li> </ul>	<ul style="list-style-type: none"> <li>Local peoples are getting livelihood support from forest produce.</li> </ul>
21	CA Block Plantation/ Deogarh/ Reiamal/ Chadheimara/ Sunaposi	<ul style="list-style-type: none"> <li>2.5 meter spacing is maintained</li> <li>Bamboo fencing is provided on one side of the plantation to protect it from grazing</li> </ul>	<ul style="list-style-type: none"> <li>Green coverage of the site has been increased.</li> </ul>
22	Block Plantation/ Deogarh/ Pallahara/ Jamardiha/ Nagira	<ul style="list-style-type: none"> <li>This is a mixed plantation site where AR &amp; ANR plantation has done i.e. AR 130 Ha. &amp; ANR 51.14 Ha.</li> <li>Previously the area was encroached by Nagira villagers. In plot 2 illicit feeling were observed. In fact local people also planted cashew in some parts of the plantation area</li> <li>The growth of the plant is good. 2.5 meter spacing maintained.</li> </ul>	<ul style="list-style-type: none"> <li>The major impact of the plantation is that the department makes this site encroachment free and made it forest again. The green coverage of the site has increased in comparison to before CAMPA intervention.</li> </ul>



Sl.No	Plantation/ Division/ Range/ Section/ Beat	Observation	Impact of the Plantation
23	Block Plantation/ Keonjhar/ Champua/ Champua/ Champua	<ul style="list-style-type: none"> <li>The plantation has created on revenue land of sarei village. On 4 patches of plantation has been done.</li> <li>since last 3 years there were forest fire incidence in the patch which results to high mortality rate.</li> <li>illicit felling was also observed. The Sarei villager's cut down the trees without taking permission. But after intervention cutting activity has reduced.</li> <li>No SMC work has been done due to plain land.</li> </ul>	<ul style="list-style-type: none"> <li>There was no forest growth before plantation. Bushes of Kendu, Char, Asan, Karei, were there before plantation. Cashew plantation were also done under Cashew beautification scheme but project was not successful.</li> </ul>
24	CA Block Plantation/ Keonjhar/ Ghatagaon/ Dhenkikot/ Dhenkikot	<ul style="list-style-type: none"> <li>Due to small area no watch &amp; ward given to the plantation area.</li> <li>As the evaluation team had visited the site in the rainy season so enormously grass had grown in the site.</li> <li>There is a nala in the north direction of the plantation site for which soil erosion has observed.</li> </ul>	<ul style="list-style-type: none"> <li>The site was taken to compensate the forest plantation.</li> </ul>
25	Block Plantation/ Bonei/ Bonei/ Dhamendragadi/ Kinjirikela	<ul style="list-style-type: none"> <li>It is a road side plantation. Plant has setup nearby plantation site.</li> <li>Illegal cutting of trees was observed.</li> <li>Watch &amp; Ward required for proper protection. Biotic interference was observed.</li> <li>Grass &amp; bushes were spread out through the plantation area.</li> <li>Simaruba &amp; Acacia has grown comparatively high with respect to other plants</li> </ul>	<ul style="list-style-type: none"> <li>Increased in soil moisture composition and check in soil erosion</li> </ul>
26	Block Plantation/ Rourkela/ Bishra/ Birikera/ SanRamlei	<ul style="list-style-type: none"> <li>Illicit feeling hasn't observed in the site.</li> <li>No SMC work has done.</li> <li>No VSS has linked to the forest but Birkera VSS voluntary taking care of the forest and plantation site</li> <li>The growth of the teak plantation has good.</li> <li>It was a hilly site.</li> <li>Sidha, Sunari, Mahula were the naturally regenerated species observed in the site.</li> </ul>	<ul style="list-style-type: none"> <li>Before plantation the site was barren but after plantation green coverage of the site increased.</li> </ul>

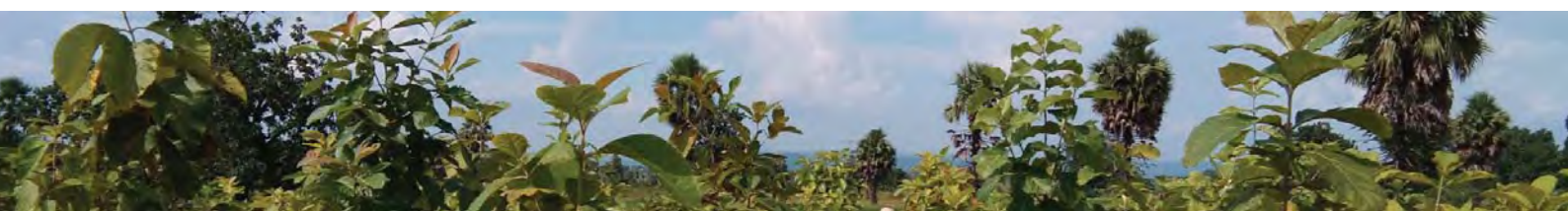


Sl.No	Plantation/ Division/ Range/ Section/ Beat	Observation	Impact of the Plantation
27	Block plantation AJY/Rourkela/ Bishra/ Bishra/ Mahipani	<ul style="list-style-type: none"> <li>VSS member participation is high in the forest protection and also they support the department for any kind of assistance.</li> <li>Natural species like Sal, Bahada, Char, Mahula, Kendu observed in the site.</li> <li>They received the training on SMC and nursery creation.</li> </ul>	<ul style="list-style-type: none"> <li>10 Ha. Plantation has taken under AJY scheme which helps to augmented the green coverage of the site.</li> <li>The sighting of wild animals is frequent.</li> <li>It supports the livelihood of locals.</li> </ul>
28	Block Plantation (MWS)/ Rourkela/ Kunarmunda/ Kunarmunda/ Ushra	<ul style="list-style-type: none"> <li>The plantation has been done in 4 patches.</li> <li>No SMC work has been done at the site.</li> <li>NTFP &amp; Bushes were collected by VSS members for fencing purposes.</li> </ul>	<ul style="list-style-type: none"> <li>The land was barren before plantation which is now converted to a forest.</li> </ul>
29	CA Block Plantation/ Rourkela/Banki/ Banki/Banki	<ul style="list-style-type: none"> <li>The plantation has done on the revenue land to compensate plantation on behalf of Tantre Iron ore Plant.</li> <li>Neem was planted for first year casualty replacement</li> <li>Growth of the plantation hasn't good enough due to poor soil quality.</li> </ul>	<ul style="list-style-type: none"> <li>The plantation was done on the land to compensate plantation on behalf of Tantre Iron ore Plant which leads to increase green coverage of the site.</li> </ul>
30	CA Safety Zone Plantation/ Keonjhar/ Champua/ Bamebari/ Dabuna	<ul style="list-style-type: none"> <li>The plantation has been done on hilly terrain.</li> <li>It is done inside of the ML Rungta mines</li> <li>2.5 meter spacing is maintained.</li> </ul>	<ul style="list-style-type: none"> <li>The plantation is inside the ML Rungta mines which created a green safety zone inside the mines area.</li> <li>It helped to control the pollution and to increase the green coverage inside the mines area.</li> </ul>





Sl.No	Plantation/ Division/ Range/ Section/ Beat	Observation	Impact of the Plantation
31	Bamboo plantation/ Bonei/Sole/ Saliguda/ Sole	<ul style="list-style-type: none"> <li>The forest is dominated by natural species like Sal followed by Kendu, Char, Sidha, Asana, Bhalia etc. 7500 seedlings were planted @ of 50 bamboo at 1 hector plot. Kanta Bamboo and salia bamboo both were planted.</li> <li>Half-moon trench is the only SMC work observed with siltation of more than 70 %. Due to lack of moisture content in soil more that 15% of Bamboo plants dry.</li> <li>Collection of “karadi” by nearby villagers observed which damaged the bamboo clumps.</li> <li>Barbed wire fencing was done to protect the plantation site.</li> <li>Elephant movement was high in the area so bamboo plantation will become a good fodder stuff for them. Before plantation the area was degraded and after that the green coverage increased</li> <li>Bamboo plantation has been done in Gap. Growth of the bamboo is not good.</li> </ul>	<ul style="list-style-type: none"> <li>Moisture content in the soil was very low but after creation of SMC structures like half-moon trench it helped to maintain the moisture.</li> <li>Due to watch and ward during plantation regeneration of new species like Bhalia, Kendu, Sal, Asan are observed in plantation area.</li> </ul>
32	ANR without Gap AJY/Keonjhar/ BJP/ Suakati/ Suakati	<ul style="list-style-type: none"> <li>Naturally regenerated species like, Sal, Piasal, Jamun, Asasna, Kendu, Chara, Bahada, Kusuma has observed in the site.</li> <li>After AJY intervention illicit felling has minimized and green coverage has increased.</li> <li>Cleaning, weeding, high stump cutting was done. The forest becomes dense.</li> <li>Cattle grazing has increased. Forest fire occurrence has reduced after VSS-AJY intervene.</li> <li>Villagers in this forest is very helpful and supportive in forest protection.</li> </ul>	<ul style="list-style-type: none"> <li>Illicit felling and forest fire reduced.</li> </ul>
33	ANR without Gap AJY/ Bonei/ Tamda/ Bhaludunguri/ Bhaludunguri	<ul style="list-style-type: none"> <li>Weeding, Cleaning, high stump cutting, digging of staggered trench and LBCD has done in the plantation site.</li> <li>Natural species like Karda, Sal, Piasaal, Kendu, Asan, Dhura, Sidha, Kuri, Dhatuki, Gangasuli were observed in the site.</li> <li>NTFP produce increased. This VSS has got the best VSS award in 2018.</li> <li>People get livelihood support. Density of the forest gradually increased.</li> </ul>	<ul style="list-style-type: none"> <li>Supports livelihoods of the people and sustainable use of forest. Sighting of wild animal increased. After AJY implementation Illicit felling cases have been minimized.</li> </ul>



Sl.No	Plantation/ Division/ Range/ Section/ Beat	Observation	Impact of the Plantation
34	Baldhill Plantation/ Rourkela/ Kunarmunda/ Kunarmunda/ Kunarmunda	<ul style="list-style-type: none"> <li>This site was covered earlier under social forestry where Simaruba had planted. Near about 18 trees has cut down by the local people.</li> <li>Regeneration of Coppices from the cutting stump has also observed.</li> <li>Soil moisture increased.</li> </ul>	<ul style="list-style-type: none"> <li>Developed green coverage after plantation of this site.</li> </ul>
35	Baldhill Plantation/ Sundargarh/ Ujalpur/ Ujalpur/ Tashladihi	<ul style="list-style-type: none"> <li>Acacia is the major dominating species planted followed by Teak, Sanachakunda, Cashew, Teak etc.</li> <li>Mahulipali VSS has linked with the site but the VSS member hasn't that much active.</li> <li>Acacia, Teak, Cashew were naturally regenerated in the site. The growth of the plantation has significantly high.</li> </ul>	<ul style="list-style-type: none"> <li>After plantation barren land converted to green coverage forest.</li> </ul>
37	SSO Bamboo/ Rourkela/ Banki/Banki/ Chandrapur	<ul style="list-style-type: none"> <li>All clumps were properly numbered.</li> <li>The site is dense hilly forest</li> <li>Due to elephant movement some of the clumps were shattered.</li> <li>Local people used to cut down the bamboo to collect Karadi for eating purpose.</li> <li>Removal of congestion has done</li> <li>Regeneration of new culms observed in the site</li> </ul>	<ul style="list-style-type: none"> <li>Due to stone and soil packing erosion of soil has minimised and regeneration of new culms observed.</li> </ul>
38	SSO Bamboo/ Sundargarh/ Hemgiri/ Hemgiri/ Ostali	<ul style="list-style-type: none"> <li>All clumps were properly numbered. Dense hilly forest. The density of bamboo clumps is high.</li> <li>Congestion removal and thinning has been done properly</li> <li>For boundary demarcation double coal tar ring has done at tree minimum height. Elephant movement in the area is high. Bamboo is being used as elephant fodder.</li> <li>Due to silvicultural operation regeneration new bamboo culms has observed</li> </ul>	<ul style="list-style-type: none"> <li>After SSO the Bamboo clumps regenerated more culms.</li> <li>Got word and wages of the frieng villagers.</li> <li>The soil erosion has been decreased. Due to stone and soil packing erosion of soil has minimised and moisture in soil increased.</li> </ul>
39	SSO Bamboo/ Deogarh/Barkot/ Thianal/ Thianal	<ul style="list-style-type: none"> <li>The SSO bamboo area has heavily dense forest. The SSO site has a B/C 'B' coupe.</li> <li>Congestion removal and thinning has been done properly</li> <li>All the clumps were numbered properly</li> <li>Due to silvicultural operation regeneration new bamboo culms has observed</li> </ul>	<ul style="list-style-type: none"> <li>Increased bamboo culms.</li> <li>Movement of the elephant is high in the area so bamboo is being used as elephant fodder</li> </ul>



Sl.No	Plantation/ Division/ Range/ Section/ Beat	Observation	Impact of the Plantation
40	SSO Bamboo/ Bonei/ Tamda/ Gurundia/ Kantapali	<ul style="list-style-type: none"> <li>For boundary demarcation double coal tar ring has done to reference tree at minimum height. Elephant movement in the area is high.</li> <li>Numbering has done for each clump. Stone and soil packing have done in each clump.</li> <li>Local people cut the culms for karadi collection</li> <li>Removal of congestion in the clumps has done</li> </ul>	<ul style="list-style-type: none"> <li>After SSO the Bamboo clumps regenerated more culms.</li> <li>The people of the nearby village got work and wages,</li> <li>The soil erosion has been checked.</li> </ul>

## 9.12 Performance of Ama Jungle Yojana

With the objective of assessing the performance of Ama Jungle Yojana, type of involvement of VSSs in plantation activities, practices followed by VSSs for AJY led plantation, and various impacts of CAMPA as undertaken four sampled out VSSs at Deogarh, Keonjhar, Bonei, and Rourkela divisions were assessed.

### 9.12.1 Involvement in Plantation Activities

As it is observed from the following table, all the sample VSSs follow CAMPA guidelines for plantation activities and undertake pre planning for plantation activities. All VSSs were to have been involved at various stages of plantation development. All the VSSs adhere to project implementation procedures. Three out of four VSSs do maintain good relationship and cooperation with department people.

Table 9.26: VSSs involvement in CAMPA Activities

Sl.	Name of the VSS/ Division/ Range/ Section / Beat/ Village	Following CAMPA Guidelines	Pre planning	Involvement in various stages	Project planning	Adhering to Project Impleme- ntation	Good relationship and cooperation
1	Bhalupali VSS / Deogarh/Barkot/ Dantaribahal Kurkunda/ Bhalupali	Yes	Yes	Yes	Yes	Yes	Yes
2	Sanda Baldiha / Keonjhar/ BJP/ Suakati/ Suakati/ Sanda Baldihi	Yes	Yes	Yes	Yes	Yes	No
3	Sisudihi VSS / Boniei/ Tamda/ Baludunguri/ Bhaludunguri/ Sisudihi	Yes	Yes	Yes	Yes	Yes	Yes
4	Mahipani Oramtola VSS / Rourkela/ Bisra/ Bisra / Mahipani/ Mahipani	Yes	Yes	Yes	Yes	Yes	Yes





### 9.12.2 VSS Practices

All the VSSs conduct meetings regularly. However, the attendance in the meeting in majority of VSSs is a found average implying that more than 50 percent of the VSS members participate in the meeting. All of the VSSs conduct awareness programmes regarding positive impacts of plantation programme. With respect to record maintenance, three VSSs out of four VSSs maintain and update records properly. For labour participation in plantation activities, wage payments are received fortnightly by majority of VSSs. DBT through bank A/Cs is reported by all the VSSs. Training programmes for capacity development of VSS members are undertaken by majority of VSSs.

*Table 9.27: Type of Major Practices followed by the VSSs*

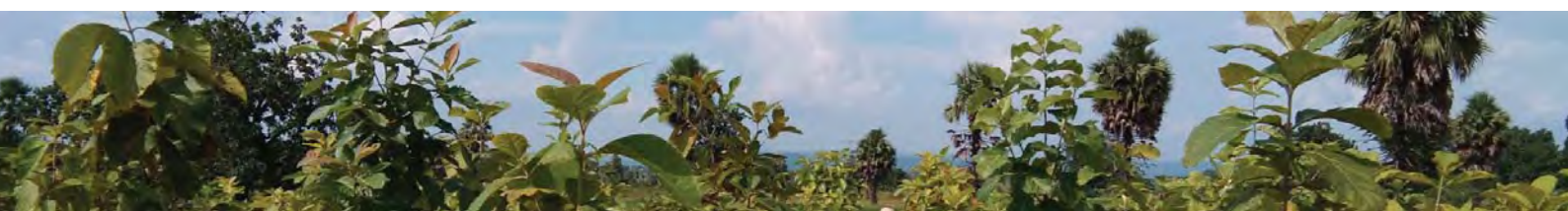
Sl.	Name of the VSS/ Division/ Range/ Section / Beat/ Village	Frequency of JFM Meetings	Frequency of JFA meeting	Attendance rate in meeting	Held of awareness prog	Trend of forest coverage/ plantation	Maintenance of VSS Register	Wage payment system	Mode of payment	Training prog. Organised in your area
1	Bhalupali VSS / Deogarh/Barkot/ Dantaribahal Kurkunda/ Bhalupali	Yes	Always	Average	Yes	Improved	Properly maintained	within 15 days	Bank A/C	Yes
2	Sanda Baldiha / Keonjhar/ BJP/ Suakati/ Suakati/ Sanda Baldihi	Yes	Always	Average	Yes	Improved	Partly Maintained	within 15 days	Bank A/C	No
3	Sisudihi VSS / Boniei/ Tamda/ Baludunguri/ Bhaludunguri/ Sisudihi	Yes	Always	Good	Yes	Improved	Properly maintained	within 15 days	Bank A/C	Yes
4	Mahipani Oramtola VSS / Rourkela/ Bisra/ Bisra Mahipani/ Mahipani	Yes	Always	Average	Yes	Improved	Properly maintained	More than 30 days	Bank A/C	Yes

### 9.12.3 Impact of CAMPA led AJY

Due to CAMPA support, status of plantation is found to have improved in all the VSS areas, and frequency of forest fire incidences are rarely witnessed, there is no Podu cultivation which was practiced by the villagers previously. Entry of wild animals into habitations is mainly controlled and out of four VSSs, it is reported only in one VSS. There is human animal conflict mitigation plan in two out of four VSSs. Frequency human animal conflict is rarely reported. Due to CAMPA supported plantation and SMC works, water level in forest fringe villages tended to increase.

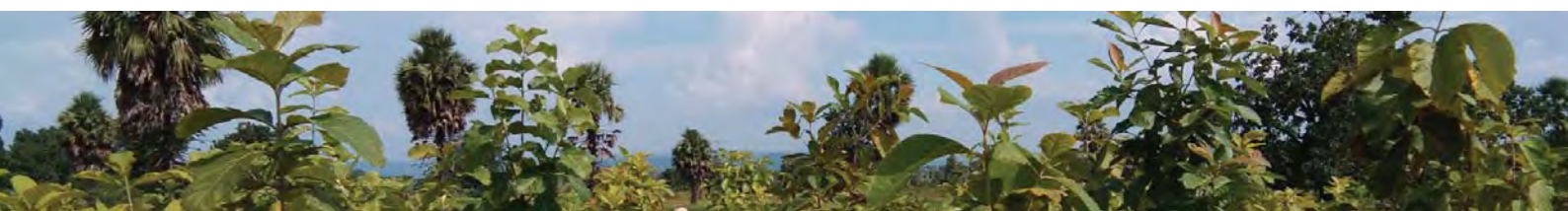
*Table 9.28: Type of major impacts of CAMPA led AJY*

Sl.	Mode of protection of plantation	Frequency of fire incident	Practice of Podu cultivation	wild animal visit	Mitigation plan for human animal conflict	Frequency the human Animal conflict	Change of water level after plantation under CAMP
1	Watch & Ward by VSS members	Rarely	No	No	Yes	Rarely	Increased
2	Watch & Ward by VSS members	Never	No	No	No	Rarely	Increased
3	2persons watch every day in day time	Never	No	Yes	Yes	Rarely	Increased
4	Watch & Ward by VSS members	Never	No	No	No	Never	Increased



### 9.13 Performance of Roads, Culvert & Causeway

Asset type/ Division/ Range/ Section/ Beat	Type of current use and Observations	Impacts	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality of Assets
Forest Road / Deograh / Reamal/ Rengalbeda/ Gundiapali	<ul style="list-style-type: none"> <li>The forest road is found in good condition.</li> </ul>	<ul style="list-style-type: none"> <li>Used by forest department to roam in the forest area for watch &amp; ward and also for other activities.</li> <li>The forest road also facilitates communication facility to the people of fringe villages.</li> </ul>	10	High
Causeway/ Bonei/ Sole/ Mahuldiha/ Sirgida	<ul style="list-style-type: none"> <li>With the objective of checking soil erosion and easy movement within the forest the causeway was created.</li> </ul>	<ul style="list-style-type: none"> <li>It helps to move vehicles in all seasons which made forest activity in the forest patch easy.</li> <li>It also checks the flow of water and prevents soil erosion in surrounding land area.</li> </ul>	7	Medium
Forest Road/ Rourkela/ Kuanrmunda/ Kuanrmunda/ Garjan	<ul style="list-style-type: none"> <li>The road is being used by local people and department people.</li> <li>Used for patrolling, monitoring &amp; supervision of plantation as well as non-plantation activity.</li> </ul>	<ul style="list-style-type: none"> <li>Shortest Road to Bad Dalki &amp; Musapali which helped department staff to monitor the different activity easily.</li> </ul>	7	Medium
Forest Road / undargarh/ Kuanrmunda/ Kuanrmunda/ Kuanrmunda	<ul style="list-style-type: none"> <li>Connect to Kalunga-Gurundia MDR-26 from Bad Dalki all-weather Road.</li> </ul>	<ul style="list-style-type: none"> <li>Patrolling of forest depart</li> <li>Local pement staff made easy.</li> <li>Local people used this road to access market when required.</li> <li>Tracking elephant movement becomes smooth by the tracker.</li> </ul>	9	High
Causeway/ Sundargarh/ Gopalpur/ Gopalpur/ Tikinipada	<ul style="list-style-type: none"> <li>Upper-side of the causeway is found silted.</li> </ul>	<ul style="list-style-type: none"> <li>Facilitates all weather vehicle movement round the year.</li> <li>It helps to move easily within the forest boundary in all seasons.</li> </ul>	7	Medium
Culvert/ Sundargarh/ Gopalpur/ Turia/ Jamkani	<ul style="list-style-type: none"> <li>The culvert is located on Gopalpur to Jamkani Road</li> </ul>	<ul style="list-style-type: none"> <li>Used for patrolling in all seasons.</li> </ul>	9	High





### 9.14 Performance of Buildings constructed under CAMPA

Type of Assets/ Division/ Range/ Section/ Beat	Type of current use and Observations	Impacts	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
Forester office cum Residence/ Deograh/ Reamal/ Rengalbeda/ Rengalbeda	<ul style="list-style-type: none"> <li>Used by Rengalbeda Forester for office as well as residence</li> <li>Due to non-availability of seizure yard, part of the building is also used to safekeep the seized items.</li> <li>Water and Electricity facility is found lacking.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building forester is staying here and it helped him to do patrolling work as per the requirement his field monitoring made easy.</li> </ul>	7	Medium
Forest Guard Quarter/ Deograh/ Reamal/ Rengalbeda/ Rengalbeda	<ul style="list-style-type: none"> <li>Used by Rengalbeda Forest guard.</li> <li>Constructed in the campus of forester residence cum quarter.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this forest guard is staying here and smoothly carrying out the forest activities.</li> </ul>	6	Medium
Forest Guard Quarter/ Deograh/ Reamal/ Rengalbeda/ Gundiapali	<ul style="list-style-type: none"> <li>Used by Gundapali Forest guard for staying</li> <li>Water and electricity facility is highly required.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this forest guard is staying here and smoothly carrying out the forest activities.</li> </ul>	6	Medium
Range Office/ Keonjhar/ Champua/ Champua/ Champua	<ul style="list-style-type: none"> <li>Range office is functioning from this building.</li> <li>All facilities are available at the site.</li> </ul>	<ul style="list-style-type: none"> <li>Range office made functional with good working environment.</li> </ul>	9	High
Forester office cum Residence/ Keonjhar/ Champua/ Bamebari/ -Kalimati	<ul style="list-style-type: none"> <li>Bamebari Forester is staying in the quarter.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this building forester is staying here and it helped him to do patrolling work as per the requirement his field monitoring made easy.</li> </ul>	7	Medium
Forest Guard Quarter/ Keonjhar/ Champua/ Bamebari/ Nayagarh	<ul style="list-style-type: none"> <li>Used for staying of the forest Guard.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this forest guard is staying here and smoothly carrying out the forest activities.</li> </ul>	3	Medium
Watcher Shed/ Deograh/ Champua/ Bamebari/ Malda	<ul style="list-style-type: none"> <li>Watcher staying facility is ensured.</li> <li>However, there is no electric facility.</li> </ul>	<ul style="list-style-type: none"> <li>It is easy to perform his duty in terms of good protection of the plantation as well as protection of forest from fire incidents.</li> </ul>	7	Medium



Type of Assets/ Division/ Range/ Section/ Beat	Type of current use and Observations	Impacts	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
Staff Barrack/ Deograh/ Ghatagaon/ Ghatagaon/ Ghatagaon	<ul style="list-style-type: none"> <li>Para staff, Watcher &amp; Guards are staying in barrack on regular basis.</li> </ul>	<ul style="list-style-type: none"> <li>Due to such facility, para staff and others are always in ready position to render their services for forest protection.</li> </ul>	10	High
Range office/ Bonei/ Bonei/ Bonei/ Bonei	<ul style="list-style-type: none"> <li>A good building with all facilities including electricity and sanitation.</li> <li>It has become easier for undertaking regular official works as well as the management work from the range office.</li> </ul>	<ul style="list-style-type: none"> <li>The forest work has been managed easily.</li> <li>The direct supervision of the Range officer could be done easily. Information sharing became easy within a short period of time</li> </ul>	10	High
Malkhana/ Bonei/ Tamda/ Bhaludunguri/ Bhaludunguri	<ul style="list-style-type: none"> <li>Use for keeping of seized wood log</li> </ul>	<ul style="list-style-type: none"> <li>All seized item is kept in safety conditions within building</li> </ul>	9	High
Ranger's Residence/ Bonei/ Tamda/ Gurundia/ Gurundia	<ul style="list-style-type: none"> <li>A good building with all facilities including electricity and sanitation.</li> <li>It has become easy for official works as well as the management work from the forest area</li> </ul>	<ul style="list-style-type: none"> <li>The forest work has been managed easily.</li> <li>The direct supervision of the Range officer could be done easily. Information sharing became easy within a short period of time</li> </ul>	9	Good
Forester office cum Residence/ Bonei/ Tamda/ Gurundia/ Gurundia	<ul style="list-style-type: none"> <li>Occupied by the Forester of Gurundia.</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forester to stay and perform his office &amp; supervision work from the forest area in a better manner.</li> </ul>	9	Good
Forest Guard Quarter/ Bonei/ Tamda/ Gurundia/ Gurundia	<ul style="list-style-type: none"> <li>The Forest Guard Quarter is well functioning with its intended purpose.</li> </ul>	<ul style="list-style-type: none"> <li>Due to this forest guard is staying here and smoothly carrying out the forest activities.</li> </ul>	9	High
Antipoaching check gate with rest shed/ Bonei/ Sole/ Mahuldiha/ Sirgida	<ul style="list-style-type: none"> <li>Check gate was constructed at Sirgida beat to control poaching cases and also a rest shed was constructed for resting facilities of staff.</li> </ul>	<ul style="list-style-type: none"> <li>It minimized the smuggling and poaching activities.</li> </ul>	9	High
Forester office cum Residence/ Rourkela/ Bisra/ Khiratola/ Khiratola	<ul style="list-style-type: none"> <li>The section office is operated and forester Khiratola staying there.</li> <li>Need for installation of deep bore well with casing PVC pipe due to high iron contamination water.</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forester to stay and perform his office &amp; supervision work from the forest area in a better manner.</li> </ul>	7	Medium



Type of Assets/ Division/ Range/ Section/ Beat	Type of current use and Observations	Impacts	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
Range office/ Rourkela/ Bisra/ Bisra/ Bisra	<ul style="list-style-type: none"> <li>Operating Range office with all other facilities</li> </ul>	<ul style="list-style-type: none"> <li>Range office made functional with good working environment.</li> </ul>	8	High
Staff Barrack/ Rourkela/ Bisra/ Bisra/ Bisra	<ul style="list-style-type: none"> <li>Occupied by Para staff, Protection squad, Elephant Trakker and check gate staff</li> <li>Around 30 Staff staying in the barrack.</li> </ul>	<ul style="list-style-type: none"> <li>It helped to undertake quick and emergent petrolling work.</li> </ul>	9	High
Forest Guard Quarter/ Sundargarh/ Hemgiri/ Kodabahal/ Kendudihi	<ul style="list-style-type: none"> <li>Kendudihi Guard is staying.</li> <li>Solar system is required.</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard is satying here and able to give more time for plantation activities.</li> </ul>	6	Medium
Forest Guard Quarter/ Sundargarh/ Hemgiri/ Kodbahal/ Kendudihi	<ul style="list-style-type: none"> <li>Jhumbahal Guard Residing here.</li> </ul>	<ul style="list-style-type: none"> <li>The forest Guard is performing better compared to the past when he was staying distantly in a rented accommodation.</li> </ul>	8	High
Forester office cum Residence/ Sundargarh/ Hemgiri/ Kodbahal/ Kendudihi	<ul style="list-style-type: none"> <li>The section office is being operated from this building and forester of Kodbahal section is staying there.</li> </ul>	<ul style="list-style-type: none"> <li>The forest work has been managed easily.</li> <li>The direct supervision of the Section officer could be done easily.</li> </ul>	8	High
Forest Guard Quarter/ Sundargarh/ Gopalpur/ Tihuria/ Bhagarkachhar	<ul style="list-style-type: none"> <li>Occupied by Bhagar kachhar Forest Guard.</li> <li>However, absence of compound wall around the quarter raises some safety issues.</li> </ul>	<ul style="list-style-type: none"> <li>Forest Guard is able to monitor the plantation sites conveniently.</li> </ul>	8	High
Range office/ Sundargarh/ Ujalpur/ Tihuria/ Jamkani	<ul style="list-style-type: none"> <li>The range office is operating with all facilities.</li> </ul>	<ul style="list-style-type: none"> <li>Range office made functional with good working environment.</li> </ul>	9	High





## 9.15 Performance of Nursery

Type of Assets/ Division/ Range/ Section/ Beat	Type of current use	Impacts	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
Permanent nursery Shed / Deograh/ Reamal/ Remal/ Taranga	<ul style="list-style-type: none"> <li>1 lakh saplings, seedling yard, composite pit, warehouse Water body, Bore well, store room, seizure yard, drying yard, watchman shed, Mixing Yard, Model Range office were in the permanent nursery shed.</li> <li>Types of sapling- Karanja, Sisoo, Jamun, Sirisa, Sana sirisa, Arjun, Sandalwood, Red Sandalwood, Gambhari, Khaira, Ganga Suili, Bamboo, Amla, Kanchan etc.</li> </ul>	<ul style="list-style-type: none"> <li>Helps to create one of the good sources of saplings.</li> </ul>	9	High
Upgraded Nursery/ Bonei/ Tamda/ Bhaludunguri/ Bhaludunguri	<ul style="list-style-type: none"> <li>Need to be constructed 150mtr. Boundary wall in backside of the Nursery</li> <li>Other infrastructure like seedling yard, compost pit, mixing yard, store house, seedling beds etc. were properly maintained</li> </ul>	<ul style="list-style-type: none"> <li>Promoted easy availability of quality seedling at the plantation sites.</li> </ul>	10	High
Nursery Shed/ Rourkela/ Bisra/ Bisra/ Bisra	<ul style="list-style-type: none"> <li>Temporary resting place for Labourers working in nursery.</li> </ul>	<ul style="list-style-type: none"> <li>It is used as store house to keep farming equipment being used at the nursery s site.</li> </ul>	8	High
Mega Nursery/ Rourkela/ Rajgangpur/ Rajgangpur/ Lima	<ul style="list-style-type: none"> <li>Infrastructure like seedling yard, compost pit, mixing yard, store house, seedling beds etc. are found. The mega nursery has the capacity to produce 5 lakhs of seedling per annum</li> <li>The place is planned by the Forest department for developing into an eco-Tourism site by constructing four cottages for staying facility of the tourists.</li> </ul>	<ul style="list-style-type: none"> <li>Promoted easy availability of quality seedling at the plantation sites.</li> </ul>	10	High
Mega Nursery/ Sundargarh/ Ujalpur/ Ujalpur/ Ujalpur	<ul style="list-style-type: none"> <li>Seedlings were found at the site.</li> </ul>	<ul style="list-style-type: none"> <li>Promoted easy availability of quality seedling at the plantation sites.</li> </ul>	7	Medium



### 9.16 Performance of seizure yard and other wild life management Activities undertaken under CAMPA

Type of Assets/ Division/ Range/ Section/ Beat	Type of current use	Impacts	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
Seizure Yard/ Deograh/ Pallahara/ Sergarh	<ul style="list-style-type: none"> <li>All the seized wood log and other items were stored within the yard.</li> </ul>	<ul style="list-style-type: none"> <li>Construction of the seizure yard helped to keep the seized item safely.</li> </ul>	8	High
Saltlick/ Deograh/ Barkot/ Thianal/ Thianal	<ul style="list-style-type: none"> <li>It is used by both wild animal and local cattle.</li> <li>Salt, crystal soil &amp; other minerals were mixed to make salt lick.</li> </ul>	<ul style="list-style-type: none"> <li>Wild animals are able to get the minerals and salt from this site. But it required for renovation.</li> </ul>	4	Medium
Elephant Trench/ Deograh/ Barkot/ Thianal/ Thianal	<ul style="list-style-type: none"> <li>The trench was constructed nearby Bastira village to restrict elephant movement in the village.</li> <li>There is a divider at CC road which makes the trench less effective because the passage can be alternatively used by elephants to enter the village.</li> </ul>	<ul style="list-style-type: none"> <li>Used for partial protection to the nearest habitation.</li> </ul>	5	Medium
Solar Fencing/ Bonei/ Tamda/ Gurundia/ Madhupur	<ul style="list-style-type: none"> <li>The fence was not in a working condition.</li> <li>Local people disturbed the functioning of the solar fencing as it was creating problems for their cattle to enter into the forest for grazing. Now only RCC pillars are found without any electric cable wire.</li> </ul>	<ul style="list-style-type: none"> <li>No impact due to damage of fencing</li> </ul>	1	Low
Seizure Yard/ Bonei/ Tamda/ Gurundia/ Gurundia	<ul style="list-style-type: none"> <li>In addition to normal functioning of the seizure yard, it is also used as watcher shed by the watcher.</li> </ul>	<ul style="list-style-type: none"> <li>Construction of the seizure yard helped keep the seized item under proper watch.</li> </ul>	9	High
Saltlick/ Sundargarh/ Hemgiri/ Kodbahal/ Kodbahal	<ul style="list-style-type: none"> <li>Local cattle also used the saltlick along with wild animals.</li> </ul>	<ul style="list-style-type: none"> <li>The intervention helped in meeting the mineral requirements of the wild animals.</li> </ul>	8	High



Type of Assets/ Division/ Range/ Section/ Beat	Type of current use	Impacts	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Quality
Elephant Trench / Rourkela / Kuanrmunda / Kuanrmunda	<ul style="list-style-type: none"> <li>6.4 Km long trench was constructed to avoid human animal conflict.</li> <li>Properly maintained trench.</li> </ul>	<ul style="list-style-type: none"> <li>Villagers are able to cultivate vegetables now because of obstacles created by the trench for the entry of elephants into agricultural fields.</li> <li>During last 5-6 years there is no case of human animal conflict.</li> </ul>	10	High
Solar fencing/ Sundargarh/ Hemgiri/ Puruna/ Purna	<ul style="list-style-type: none"> <li>Fence is properly working.</li> <li>Villagers of the Purna village has taken proper care of the solar fencing.</li> <li>Continuation of electricity flow owing to effective functioning of battery is observed.</li> <li>There is one operator specially engaged to operate the solar fencing system.</li> </ul>	<ul style="list-style-type: none"> <li>Since last two years no animal human conflict observed in the site.</li> <li>The villagers have started growing vegetables and other crops because of installation of solar fencing.</li> </ul>	9	High

### 9.17 Performance of Water Body and other SMCs

Type of Asset/ Division/ Range/ Section/ Beat	Type of current use & Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
Water Body/ Deograh/ Reamal/ Rengalbeda/ Gundiapali	<ul style="list-style-type: none"> <li>Used by wild animal for drinking purpose.</li> <li>No sign board has observed.</li> <li>No slope was constructed for easy access of animals.</li> <li>There are 150 Fruit bearing plantations were planted at the embankment of the water body.</li> </ul>	<ul style="list-style-type: none"> <li>Met the water requirement of wild animals for drinking and bathing purposes.</li> </ul>	8	High

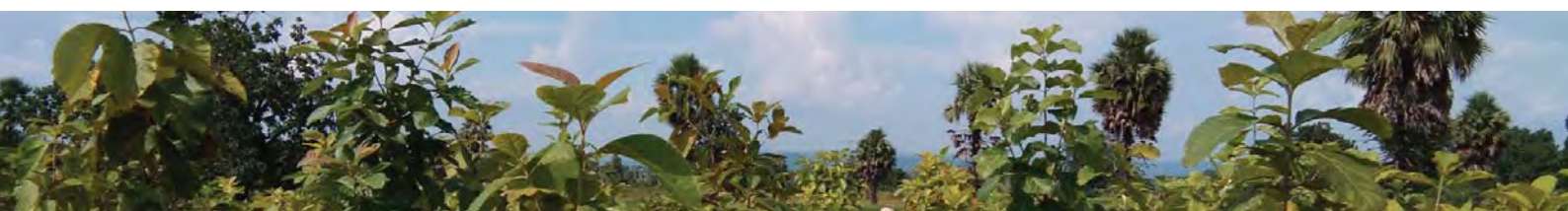




Type of Asset/ Division/ Range/ Section/ Beat	Type of current use & Observation	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Ranking
Water Body/ Deograh/ Barkot/ Thianal/ Thianal	<ul style="list-style-type: none"> <li>The site was nearer to salt lick so most of the wild animals came to the water body for drinking purpose.</li> <li>Nearby local cattle has also used the waterbody.</li> </ul>	<ul style="list-style-type: none"> <li>Water available throughout the year for drinking and bathing purpose for Wild Animal.</li> </ul>	9	High
Water Body/ Keonjhar/ Ghatagaon/ Ghatagaon/ Ghatagaon	<ul style="list-style-type: none"> <li>Used by wild animal for drinking purpose.</li> <li>Water is available throughout the year</li> </ul>	<ul style="list-style-type: none"> <li>Met the water requirement of wild animals for drinking and bathing purposes.</li> </ul>	10	High
Earthen check dam/ Bonei/ Tamda/ Saplat/ Tumbei	<ul style="list-style-type: none"> <li>1Km long earthen dam has constructed nearby village of Silikata.</li> <li>It is in good condition.</li> <li>Constructed to conserve rain water and check the top soil erosion.</li> </ul>	<ul style="list-style-type: none"> <li>4 to 6 months rain water has stored result of which water level get recharged in the upper side of the slope.</li> </ul>	8	High
Water Body/ Rourkela/ Kuanrmunda/ Kuanrmunda/ Balanda	<ul style="list-style-type: none"> <li>Used by wild animals like elephant, Barking deer, etc. The water body has created very close to Kolunga-Gurundia highway so the commuter who commute used the water for drinking and other purpose.</li> </ul>	<ul style="list-style-type: none"> <li>Met the water requirement of wild animals for drinking and bathing purposes.</li> </ul>	8	High
Water Body/ Sundargarh/ Hemgiri/ Kodbahal/ Kodbahal	<ul style="list-style-type: none"> <li>Only used by wild Animal.</li> </ul>	<ul style="list-style-type: none"> <li>Met the water requirement of wild animals for drinking and bathing purposes.</li> </ul>	8	High

## 9.18 Summary of Key Findings

- Teak, acacia, karanja, simaruba, sanachakunda constitute to be the five major tree species undertaken under CAMPA aided plantation activities.
- The average area under AR plantation per site stands at 51.3 hectares which is higher in the case of bamboo plantation. Average area per site of safety zone plantation found stands lowest at 1.7 hectares.
- Overall casualty and survival considering all plantation categories and all forest divisions is found at 8.91 and 91.6 percent respectively.



- The survival percentage of bald hill plantation stands highest compared to all other AR plantation categories.
- On the basis of casualty-based performance criteria as mentioned in the last column of the table, overall performance of all AR plantations stands 'high'.
- The coverage of canopy in percentage terms indicates that overall canopy coverage in all AR plantation categories stands at 49.8 percent which is found higher in Bonei and Sundargarh divisions.
- The coverage of canopy in percentage terms indicates that overall canopy coverage in all AR plantation categories stands at 49.8 percent which is found higher in Bonei and Sundargarh divisions.
- It is found that performance of all type of AR plantations on the basis of height as well as GBH/GCH is found 'high'.
- The average area of ANR sites is 175.6 hectares. The average area for CA-ANR with gap plantation is about 300 hectares followed by ANR with gap plantation at 165.4 hectares, PCA- ANR with gap plantation at 89 hectares and ANR without gap -AJY at 51.3 hectares.
- Analysis of plant survival and casualty of ANR with gap plantation reveals that overall, there are 186 surviving trees per 200 trees planted.
- The survival and casualty performance for ANR with gap plantation is found at 93.0 percent and 7.0 percent respectively.
- The overall canopy coverage considering all the years and all divisions is found at 61.2 percent.
- Overall height and GBH/GCH performance considering all ANR with gap plantations across forest divisions in Rourkela circle are found at 0.4 metre and 1.4 CMs respectively.
- The performance of ANR without gap plantation, on the basis of canopy performance reveals that the performance of Deoghar and Keonjhar divisions is 'high' and for Bonei division, it is 'medium'.
- The average canopy percentages of SSO- Bamboo activities vary in the range of 45.0 percent at Bonei division and 90.0 percent in Deogarh division.
- On an average, considering SSO bamboo activities for all divisions, there are 92 surviving clumps and 7 damaged clumps are found per hectare of forest area. Altogether there are 99 clumps found per hectare forest area. The survival of clumps varies between 88 to 98 percent in all the sites visited.
- The total culms performance for Sundargarh division is found highest at 4004 culms per hectare of forest area.
- Canopy performance of old teak management plantations, it is found 'high' because in all of the site average canopy (%) is more than 70 percent.
- Majority of plantation sites about 55.4 percent of the sites have two types of SMC structures. Proportionately 16.2 percent of the sites have two SMC structures and 14.6 percent of the structures have more than two SMC structures on plantation sites.
- In the case of bald hill plantations, for all of the sampled-out sites two types of SMCs are evidenced. For all of the SSO bamboo plantation sites, two types of SMCs are found.
- Half-moon trenches as well as stone packing are noticed in all of the bamboo plantation (SSO) sites. Staggered trenches are found in all ANR with gap plantation, bald-hill plantation, CA block plantation sites along with other types of SMC structures.
- Overall, it is found that there is 34.1 percent deposition of silts on SMC structures.
- Overall, 72.3 percent of the sites maintain plantation journals. Plantation journals in Dundergarh division is found entirely partially maintained or non-maintained in all the plantation sites required for maintaining plantation journals.
- Micro plans are maintained by some 5.4 percent of the plantation sites undertaking plantations under AJY.
- Treatment Maps are maintained by 21.5 percent of the plantation sites. Majority of plantation sites to the extent of 78.5 percent are found to have installed pillars around plantation sites.
- Watch and word is a common protection measure followed at majority of plantation sites.
- Natural Species like Babachakunda, Bheru, Kurai, Neem, Sidha, Kendu were observed as regenerated at the teak management site.



- Regeneration of Natural species like Rohini, Karda, Sal, Asana, Sidha, Bheru are observed in ANR with gap plantation.
- All the VSSs adhere to project implementation procedures. Three out of four VSSs do maintain good relationship and cooperation with department people.
- With respect to record maintenance, three VSSs out of four VSSs maintain and update records properly. For labour participation in plantation activities, wage payments are received fortnightly by majority of VSSs.
- Due to CAMPA intervention, a number of infrastructure facilities were created in all forest ranges including range office, forester quarter-cum -office, forest guard quarters, barracks.
- The construction quality of all type of buildings are observed good and on the basis of usability and impacts, all the infrastructure facilities are found relevant and efficient.
- Infrastructure like seedling yard, compost pit, mixing yard, store house, seedling beds etc. are found.
- All of the available facilities inside mega nursery were found well maintained.
- Solar fencing in many places are found defunct as a result of non-maintenance of solar-photovoltaic systems (SPS).

### 9.19 Suggestion

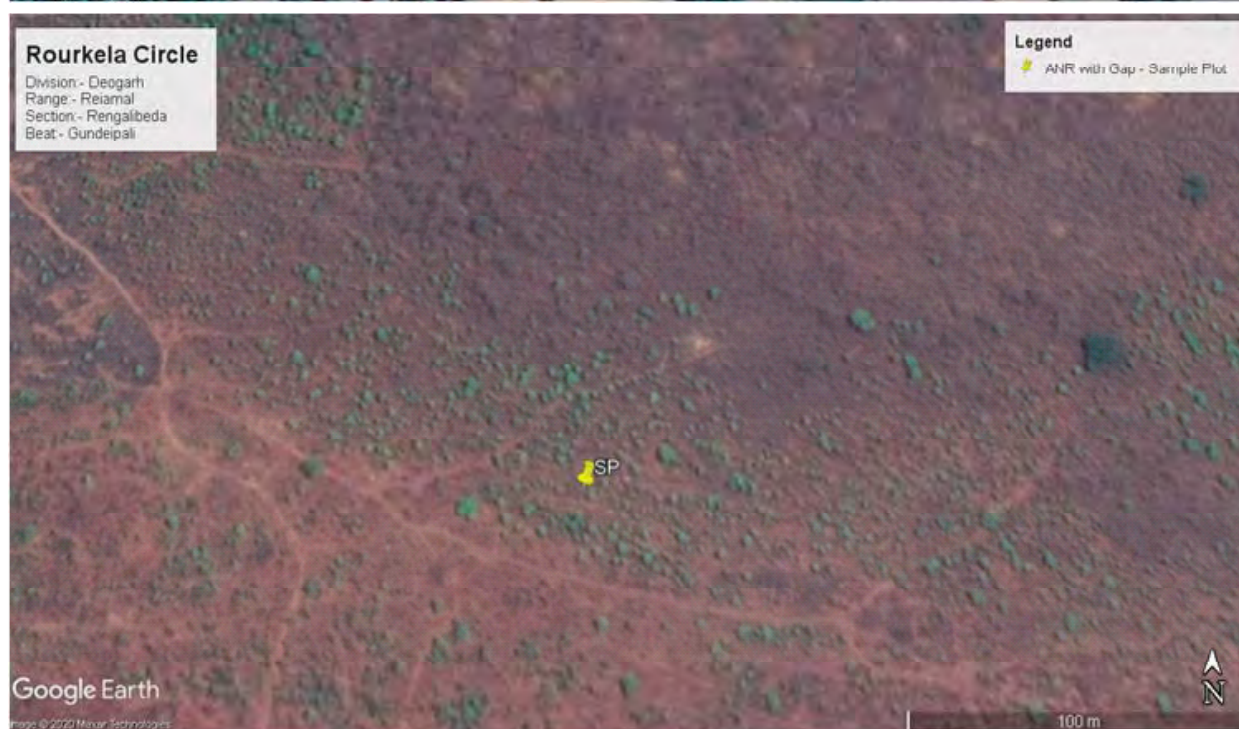
- Timely fund release is viewed to be more helpful for executing the plantation activities in the APO execution year.
- Livelihood development fund should be developed for plantation sites that are located nearby habitations. It is viewed that livelihood promotion in forest fringe areas frequently encountering poaching activities, may become very much helpful to control poaching activities.
- Taking into account the type of involvement of VSSs for protection of plantation sites, there should be provision for VSS buildings which may be used as a meeting hall as well as office of the VSS.
- Prior to selection of tree species for plantation in any site, there should be proper assessment of soil quality, climate conditions, expected variability in climate conditions etc which may be very much helpful for suitable to growth of planted trees.
- Maintenance of plantation should be extended 3years to 5years which is more effective for survival and growth rate of trees.
- More than one and half year seedlings should be recommended by department which increases the chances of higher survival rate of planted trees.
- Man-days norms for watch & ward should be increased from the current level because the current norm is viewed not so sufficient.
- Fruit bearing species should be recommended because fruit bearing trees act as a source of livelihood for the forest dependent households.
- Fodder Plantations should be prioritized in elephant corridors because such type of plantations will act as deterrents for the entry of elephants to habitations. In the process human elephant conflict will be reduced.
- “Phanpana” and Bamboo may be considered as fencing species at borders of the plantation sites.
- Budget provision for Thinning, Pruning & Cleaning in 3 to 4 years interval may be made for all plantation sites which is viewed more effective in better growth of trees and density of forest.
- Awareness generation programmes at community level for protecting forest from fire illegal cutting of trees may be undertaken under CAMPA funds.
- Maintenance provision for buildings should be considered.
- Electricity facility especially at barrack/ watcher shed and different quarters should be considered. Most often due to absence of electricity facility effective use of the already created structure is undermined.
- Mobile APP should be launched for elephant tracking and fire incidents in forest area.
- In case of solar fencing most of created units were found failed owing to entry of local cattle for grazing purpose, lack of maintenance provision due to absence of any responsible operator in the local area. Timely maintenance through empanelment of solar fencing operators may be more helpful.





- Each water body should have inlet and outlet water flow system which can recharge and discharge the excesses water in rain season
- Fund allocation for WHSs is not uniform in all CAMPA years.
- Wall writing should be mentioned in each and every Building created under CAMPA. Unique colour for all CAMPA buildings created across divisions is viewed to provide proper visibility of CAMPA.
- Para staffs, Antipoaching squad or any other type of squad those who have completed more than 7 years of employment, should be treated as semi-skilled or skilled worker.

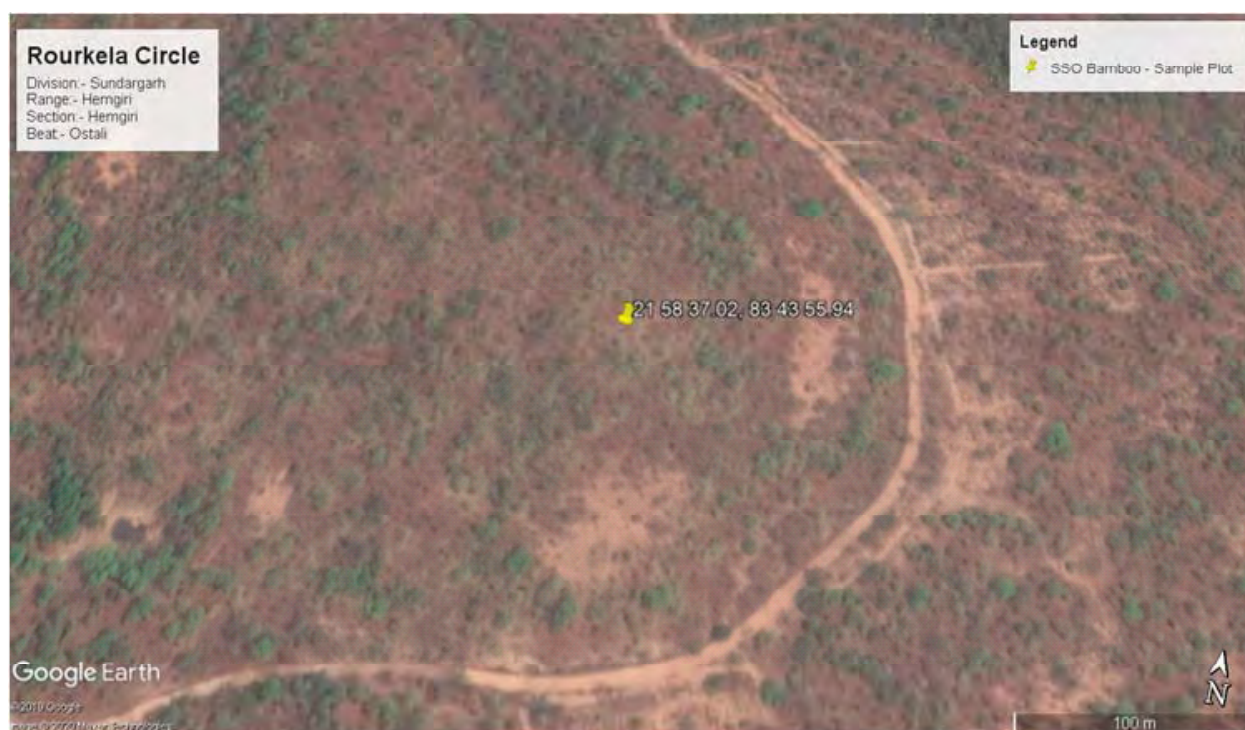
## 9.20 Satellite imagery of sample plots













## ANNEXURE- IV/III

**Year wise and Tree wise Average maximum Height and Minimum Height for all forest Divisions in Rourkela Circle**

Trees	Year	Average of Max Height in Metre	Average of Min Height in Metre	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average Height (in Metres)	Average GBH/GCH (in CMs)
Acacia	2011-12	9.3	7.2	21	18	8.3	19.5
	2013-14	3.9	2.4	14	4	3.2	9.0
	2014-15	5.2	3.5	19.1	12.9	4.4	16.0
	2015-16	4	2.9	15.1	10.1	3.5	12.6
	2016-17	3.9	1.8	8	6	2.9	7.0
Amla	2014-15	1.3	2.4	9.3	5.3	1.9	7.3
	2015-16	1.2	1	7	5	1.1	6.0
	2016-17	1.9	2.6	10	8	2.3	9.0
Arjun	2015-16	4.1	2.6	17	10	3.4	13.5
	2016-17	0.3	0.3			0.3	0.0
Badachakunda	2013-14	4.1	2.3	13.2	8.2	3.2	10.7
	2014-15	2.5	1.9	8.6	5.6	2.2	7.1
	2015-16	2.6	1.6	11.5	6.2	2.1	8.9
	2016-17	1.6	1	10	7	1.3	8.5
Bahada	2016-17	1.9	1	7	5	1.5	6.0
Bamboo	2014-15	3.6	2.5			3.1	0.0
	2015-16	3.3	2.5			2.9	0.0
	2016-17	1.7	1.2			1.5	0.0
Bela	2014-15	3.3	2.1	12	10	2.7	11.0
Cashew	2011-12	2.8	1.9	14	10	2.4	12.0
	2015-16	5.7	4.7	29.6	17.8	5.2	23.7
	2016-17	3.2	2	7	3	2.6	5.0
Chatiyana	2011-12	3.6		30		1.8	15.0
	2013-14	4.1	2.1	19.4	11	3.1	15.2
	2015-16	3.5	2.3	17.4	9.8	2.9	13.6
	2016-17	3.1	1.5	28	9	2.3	18.5
Eucalipotus	2015-16	6.9	6.2	22	17	6.6	19.5
Gambhari	2013-14	4.1	4.3	23	24	4.2	23.5
	2014-15	2.4	1.6	11.5	7.5	2.0	9.5
	2015-16	2.2	1.4	9.5	6.8	1.8	8.2
	2016-17	1.3	0.9	8		1.1	4.0



Trees	Year	Average of Max Height in Metre	Average of Min Height in Metre	Average of Max GBH/GCH in cm	Average of Min GBH/GCH in cm	Average Height (in Metres)	Average GBH/GCH (in CMs)
Jamu	2016-17	1.4	1	9	4	1.2	6.5
Kanchan	2014-15	3.7	2.5	11	8	3.1	9.5
Karanja	2013-14	4	2.5	16	3.9	3.3	10.0
	2014-15	2.5	1.5	10.2	7.2	2.0	8.7
	2015-16	2.7	1.9	11.6	7.5	2.3	9.6
	2016-17	13.3	2.2	8.8	7.4	7.8	8.1
Khaira	2014-15	4.1	2.8	8.5	7	3.5	7.8
	2015-16	3.6	3.2	9	6	3.4	7.5
Mahaneem	2014-15	5.1	3.8	20.8	10	4.5	15.4
	2015-16	4.4	3.7	25.4	15.2	4.1	20.3
Mangium	2013-14	5.4	4.9	18	6	5.2	12.0
	2015-16	4.8	3.4	17.1	7.7	4.1	12.4
Mango	2016-17	3.7	3.2	13	10	3.5	11.5
Neem	2010-11	3.6	2.7	8	6	3.2	7.0
	2013-14	4.6	2.8	30	10.5	3.7	20.3
	2015-16	2.9	1.9	9.6	6.8	2.4	8.2
	2016-17	2.8	2.2	9.5	6.5	2.5	8.0
Salia Bamboo	2014-15	1.1	0.7			0.9	0.0
	2015-16					0.0	0.0
	2016-17					0.0	0.0
Sanachakunda	2011-12	5.6	3.7	9	7	4.7	8.0
	2013-14	5.6	3.3	19.8	11.4	4.5	15.6
	2014-15	5.5	3.6	24.3	17.3	4.6	20.8
	2015-16	4.2	3.3	14	10.8	3.8	12.4
	2016-17	1.9	1.4	21	12	1.7	16.5
Simaruba	2010-11	5.6	2.8	13	8	4.2	10.5
	2011-12	6	4.1	35.5	24.5	5.1	30.0
	2013-14	4.3	2.2	17.6	9.2	3.3	13.4
	2014-15	3.1	3	12.7	7.7	3.1	10.2
	2015-16	3.5	2.4	14.5	9.4	3.0	12.0
	2016-17	2.3	1.7	10.9	7.8	2.0	9.4
Sirisa	2014-15	1.7	0.9	8.6	6.3	1.3	7.5
	2016-17	1	0.8	9		0.9	4.5
Sishoo	2013-14	3.3	2.1	12	6.5	2.7	9.3
	2014-15	2.4	1.5	9.2	7.4	2.0	8.3
	2015-16	3.5	2.7	11.6	7.8	3.1	9.7





Trees	Year	Average of Max Height in Metre	Average of Min Height in Metre	Average of Max GBH/ GCH in cm	Average of Min GBH/ GCH in cm	Average Height (in Metres)	Average GBH/GCH (in CMs)
	2016-17	3.5	1.9	9.4	6.1	2.7	7.8
Teak	2010-11	7.5	5	30	17	6.3	23.5
	2011-12	4.5	6.4	32.3	10.7	5.5	21.5
	2012-13	9	7	32	22	8.0	27.0
	2013-14	16.7	14.1	80.2	51.3	15.4	65.8
	2014-15	4.8	3.3	18.5	11.3	4.1	14.9
	2015-16	3.3	2	11.9	8	2.7	10.0
	2016-17	13.3	2.3	15.1	9.6	7.8	12.4







## CHAPTER - X







## 10. Evidence of CAMPA Implementation in Sambalpur Circle

### 10.1 Introduction:

The Sambalpur forest circle covers three districts, namely Sambalpur, Bargarh and Jharsuguda. The district of Sambalpur is known for its vegetation and bio-diversity. About 49.70 percent (3,292.29 sq. km.) of the total geographical area (6624 sq. km.) of the district is covered under forest<sup>22</sup> (forest of different classifications). The district witnesses a positive change in the forest cover by 12.29 percent in comparison to 2017 assessment. Very Dense Forest (VDF) is about 7.53 percent (498.99 sq. km.) of the total geographical area of the district. Medium Dense Forest (MDF) is highest, i.e., 25.61 percent (1,696.32 sq. km.) and Open Forest (OF) is 16.56 percent (1,096.98 sq. km.) of the total geographical area of the district. The Sambalpur forest circle is having six forest divisions and 31 forest ranges. Bamra forest division is the only wildlife division in the circle and remaining are territorial forest divisions.

The district of Bargarh is having geographical area of 5,837 sq. km. of which 175.01 sq. km is under very dense forest category, 374.14 sq. km. is moderately dense forest and 501.31 sq. km is open forest. Total forest area in the district is 27.60 percent of the total geographical area. There is a positive change in forest cover in the district, by 19.46 sq. km. in comparison to 2017 assessment. Total geographical area of Jharsuguda district is 2114 sq. km. of which 3.0 sq. km. is under very dense forest, 173.82 sq. km is moderately dense forest and 155.82 sq. km is open forest. Total forest area in the district is 332.64 sq. km. Total forest area to the geographical area of the district is 15.74 percent which shows an increasing trend by 10.64 sq. km. in comparison to 2017 assessment.

### 10.2 Study Coverage:

The study covered all the five forest divisions of the circle under different components of CAMPA. The forest divisions covered are (1) Bamra WL, (2) Bargarh forest division, (3) Jharsuguda Forest Division, (4) Rairakhol forest division and (5) Sambalpur forest division. Under the forest divisions, 16 ranges were covered under the study. Details are presented below. Under plantation and silvicultural operation component, the study covered 124 plots from 38 sites in 5 forest divisions, 16 forest ranges, 29 forest sections and 31 forest beats of the Circle to understand the plantation activities.

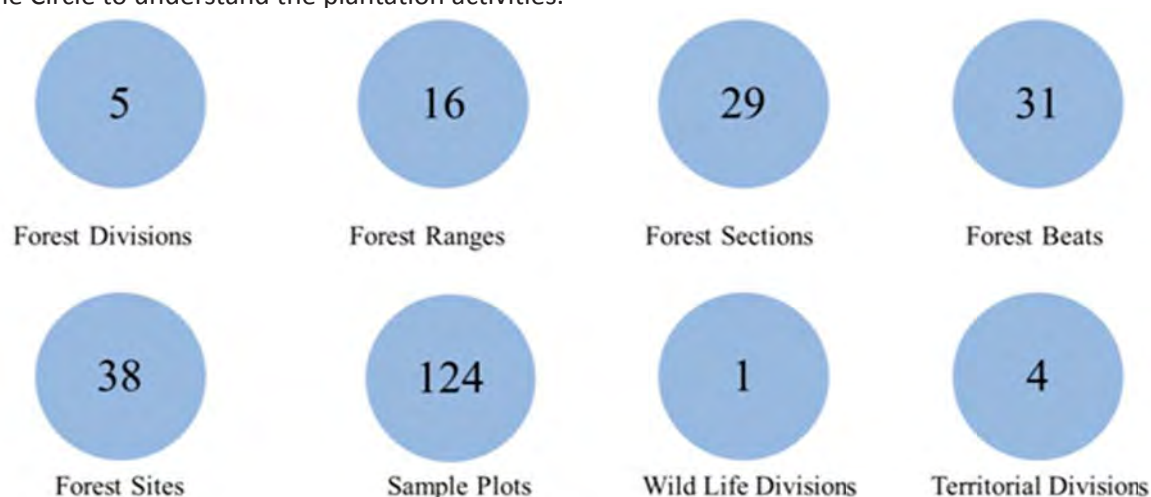
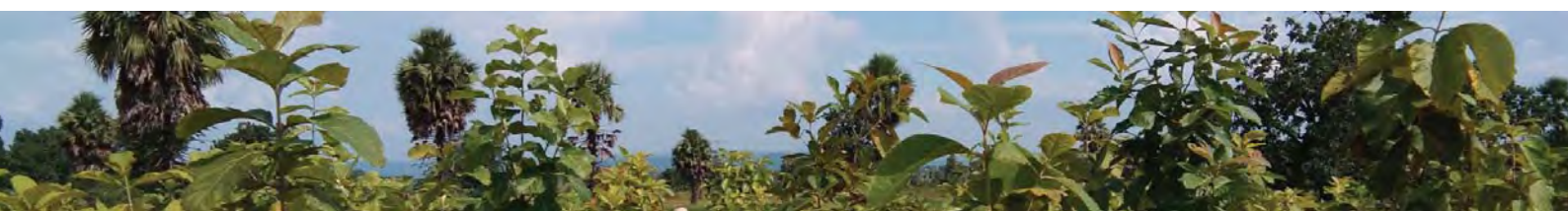


Figure 10.1: Assessment Coverage

<sup>22</sup>IFSR, 2019





### 10.3 Site Coverage:

Of the total coverage, 71.77 percent are plantation sites (of different plantation categories) and 28.23 percent are silviculture operations. Among the plantations, 41.57 percent sites are ANR with gap, 5.62 percent are bamboo plantation, 43.82 percent are block plantation, 6.67 percent are CA-PCA and remaining 2.25 percent are corridor & fodder plantation sites. Among the silviculture operations, 8.57 percent are ANR without gap, 11.43 percent are ANR without gap in AJY, 5.71 percent are management of old teak sites, 65.71 percent are SSO-bamboo and 8.57 percent are SSO-timber. Circle and Division level distribution of sites are presented in the figures.

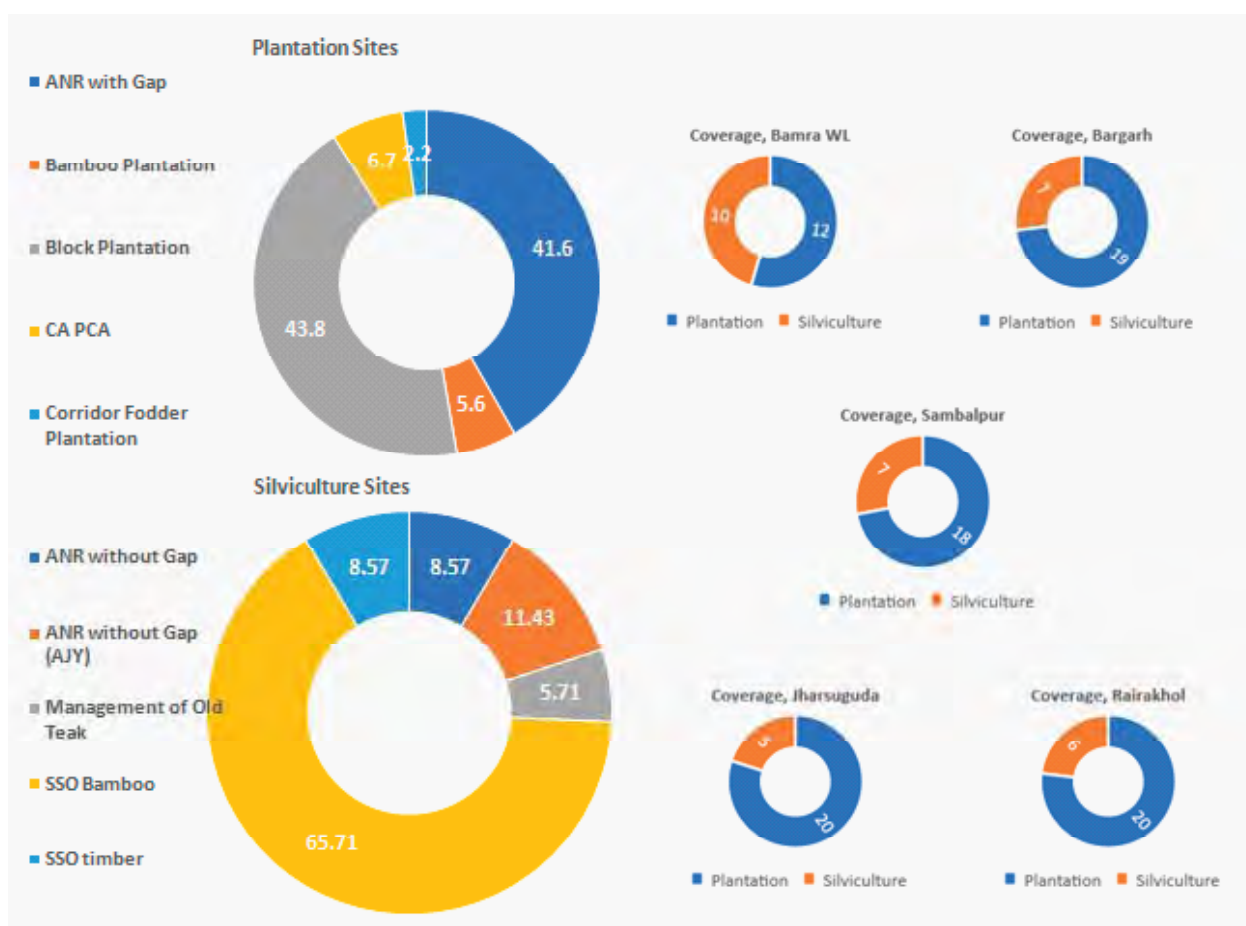


Figure 10.2: Site Coverage and Distribution

### 10.4 Area of the Site:

Plantation in the circle covers a total area of 29,368 ha. between 2009-10 to 2016-17 (excluding 2013-14), i.e., on an average 4,195.4 ha. per year, irrespective of type of plantation. Plantation by categories reflects that the circle has highest area of plantation under ANR with Gap Plantation category, followed by Block Plantation and CA-PCA. Similarly, under silvicultural operation, the area coverage remains to be 1,30,389 ha., irrespective of operational typology.



Table 10.1: Area (ha.) covered under plantation in the circle

Year	ANR with Gap	Bamboo Plantation	Block Plantation	CA-PCA	Total Plantation
2016-17	7100				7100
2015-16	6250			2079	8329
2014-15	4350	2106		540	6996
2013-14					
2012-13				578	578
2011-12				459	459
2010-11				270	270
2009-10			5636		5636
<b>Total</b>	<b>17700</b>	<b>2106</b>	<b>5636</b>	<b>3926</b>	<b>29368</b>

## 10.5 Plantation Activities:

Key plantation activities that have been taken up are ANR with enrichment planting, block plantation, CA PCA and Bamboo plantation. During 2009-10, area covered under ANR with gap plantation is highest in Bargarh, followed by Sambalpur. Similarly, 2015-16, area (in ha.) under ANR with gap plantation is highest is Bargarh, followed by Sambalpur.

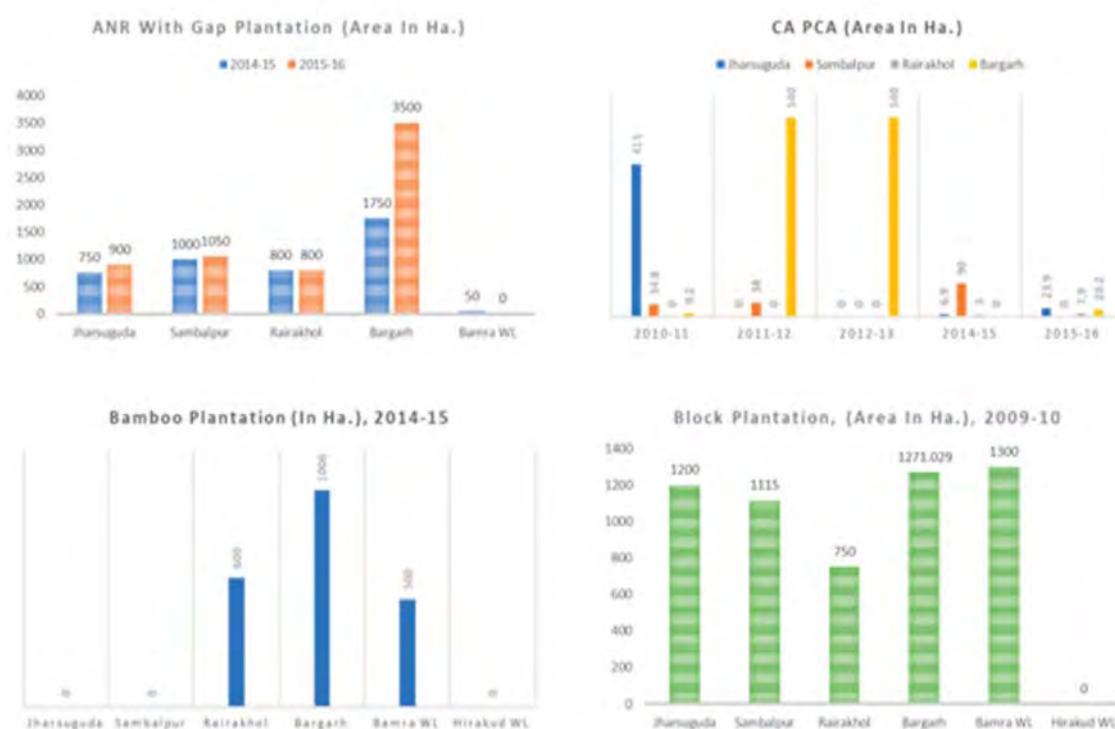


Figure 10.3: Plantation Activities



In block plantation (2009-10), area coverage in Rairakhol was less in comparison to other forest divisions. Highest area covered under block plantation was in Bamra WL, followed by Bargarh and Jharsuguda. Bamboo plantation was taken up in 2014-15 only in 3 forest divisions, i.e., Rairakhol, Bargarh and Bamra WL. Plantation activity by year of plantation in different plantation categories are presented in the figure.

## 10.6 Silvicultural Operation:

Under silvicultural operations, activities taken up are like SSO-Timber, SSO-Bamboo, ANR without Gap and maintenance of old Teak plants. Apart from these, silvicultural operations / maintenance works were taken up for the area covered under plantation in different years, along with replacement for dead plants. Coverage of area under silvicultural operation under different categories are presented in the figures.

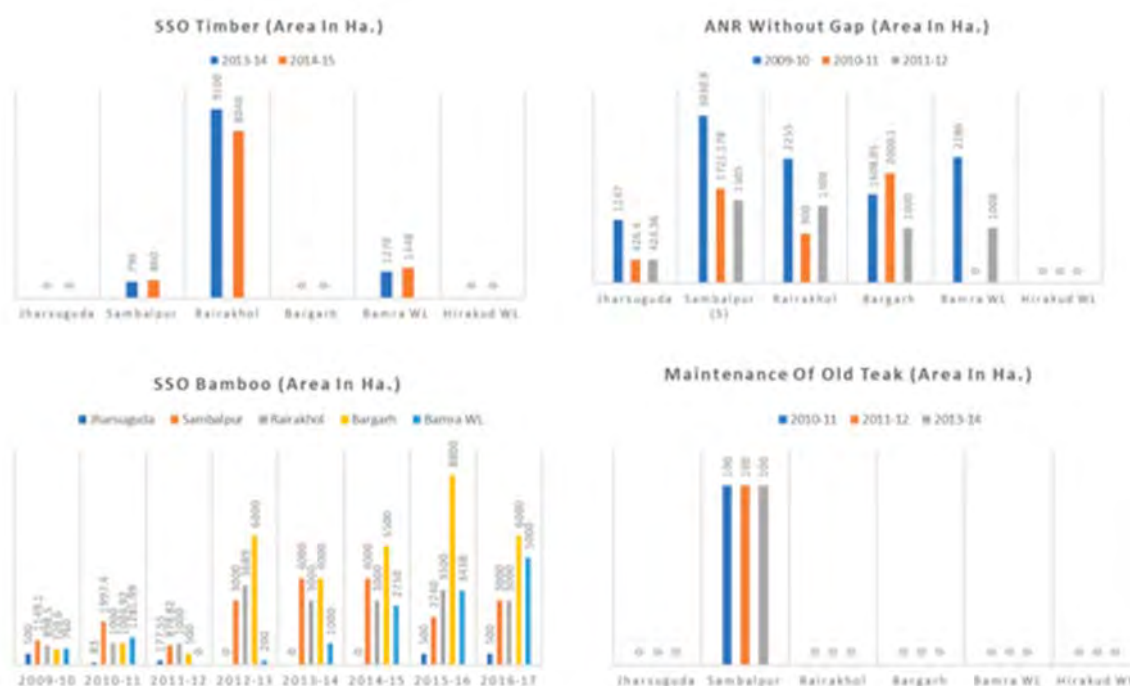


Figure 10:4: Silvicultural Operations

The average plantation area of the studied sites observed to be 130.69 ha. with total plantation area of 11,631.48 ha. Of the total plantation area, 55.8 percent are ANR with gap plantation, followed by block plantation (29.7 percent) and bamboo plantation. CA-PCA and corridor-fodder plantation has been less, i.e., 1.3 percent and 0.3 percent of the total plantation.

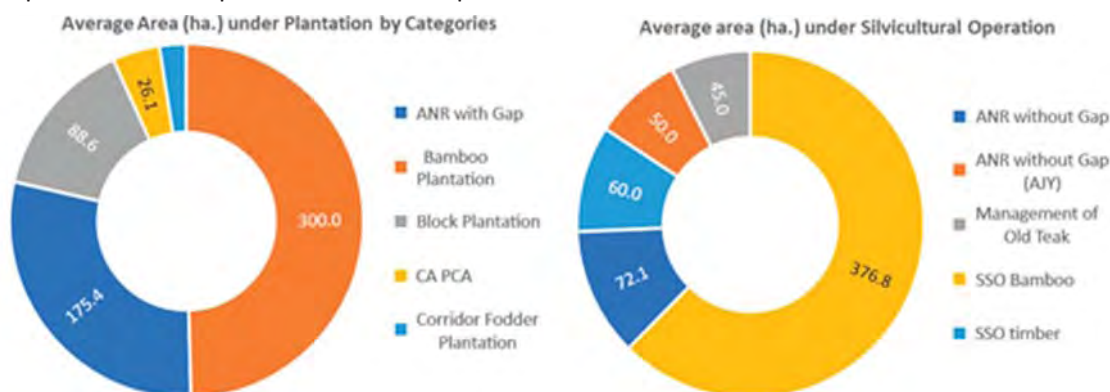


Figure 10:5: Area (ha.) under Plantation and Silviculture by Type





Average area under silvicultural operation, irrespective of its type is 267.25 ha. with total area of 9,353.81 ha. In the silvicultural operation, major emphasis has been given to SSO-bamboo (92.7 percent) followed by ANR without gap and SSO-timber. Management of old teak has been low among all the silvicultural operation in the circle.

Plantation work taken up in the circle during 2009-10 with block plantation approach and in the later phase ANR with gap plantation was taken up in selected sites as per the plan. Both block plantation and ANR with gap plantation has been the major focus at the circle level, whereas other plantation types like bamboo plantation, CA-PCA and corridor-fodder plantation is marginal.

In silvicultural operational, initially ANR without gap was taken up in the year 2011-12 but in the later stage, SSO-bamboo was given more emphasis.

Ranking of the plantation sites, based on its area (ha.) reveals that 44.94 percent plantation area, irrespective of plantation category, are between 75.1 to 100 ha., followed by plantation area of more than 200 ha. (21.25 percent) and 25.1 to 50 ha. (13.48 percent). Plantation area in other ranks, like <25 ha., >25 & ≤50 ha. etc. are relatively less. In silvicultural operation, sites normally fall under >200 ha, category (42.86 percent), followed by >=50 to <=75 ha. category (25.71 percent). There is no silvicultural operation in areas that are ≤25 ha., >75 & ≤100 ha, and >100 & ≤125 ha. Ranking of plantation sites by area (ha.) for the forest circle and divisions are presented below.

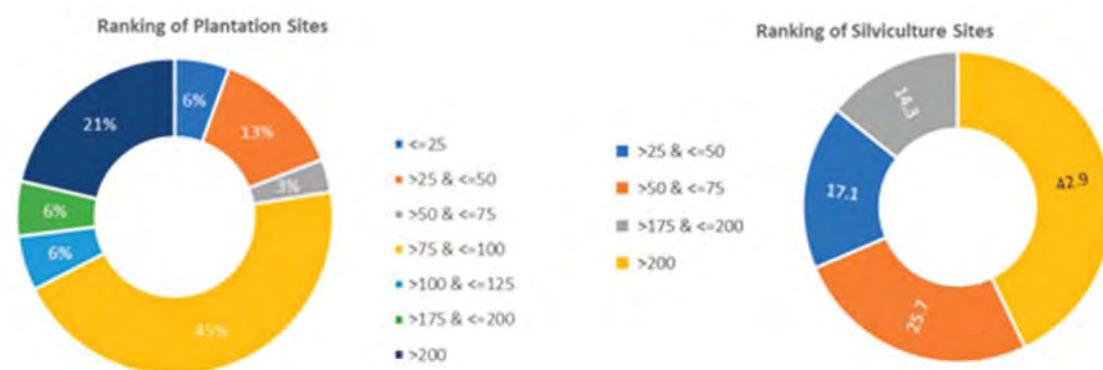


Figure 10:6: Ranking of Plantation and Silvicultural Operations by Site

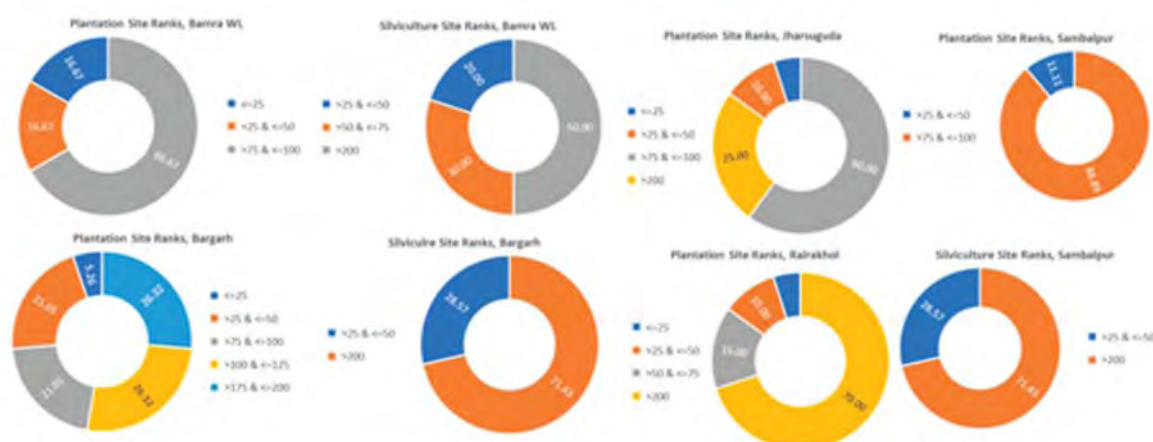
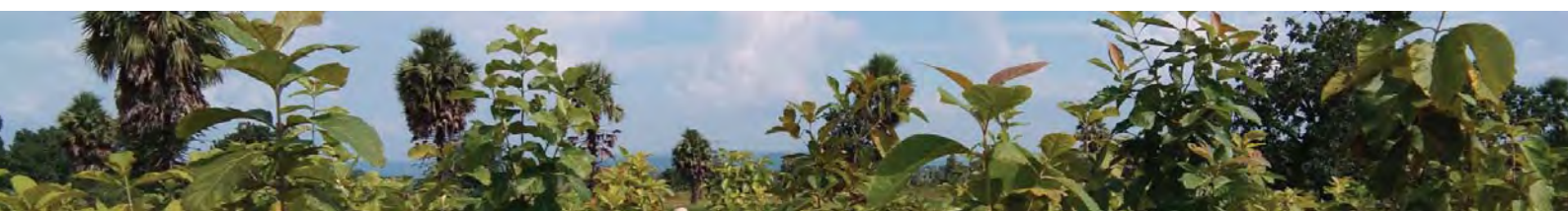


Figure 10:7: Ranking of Plantation & Silvicultural Operation by Forest Division



## 10.7 Plant Survival Rate:

Plant survival rate varies by plantation categories and forest divisions. Overall, Survival rate is calculated to be 93.1 percent. Highest plant survival rate is reported in Sambalpur (96.3 percent) and lowest in Jharsuguda forest division (91.2percent). Plant survival rate by plantation categories are discussed below.

**Block Plantation:** Average number of plants per ha., varies considerably. Plant density varies by forest division and type of plantation. In block plantation, average plant per ha. observed to be highest in Sambalpur followed by Bargarh. Rairakhol is having the lowest plant per ha. in block plantation followed by Bamra WL. The plant survival rate varies from 92.7 percent (Rairakhol) to 98.2 percent (Sambalpur).

**Corridor – Fodder Plantation:** In corridor-fodder plantation, plant per ha. enumerated to be 1490 in Bamra WL and 1300 plants per ha. in Rairakhol. The survival rate of the plants under these categories found to be 93.1 percent in Bamra WL and 81.3 percent in Rairakhol.

**ANR with Gap Plantation:** ANR with gap plantation (enrichment planting) is taken in a dual mode, i.e., dense plantation in block mode in identified patch of land and/or sparse / scattered plantation in the forest area. Plot specific plant count varies from 66 plants per plot to 106 plants per plot due to adoption of block plantation mode. As plantation mode has been of different nature, total plants planted and plants standing on the ground were taken in to account to estimate survival rate per ha. Plant survival rate per ha. varies between 87.7 percent (Jharsuguda) to 96.7 percent (Rairakhol).

**CA-PCA:** Compensatory afforestation observed in Bargarh, Jharsuguda and Rairakhol forest divisions of Sambalpur circle. Plants per ha. enumerated to be 1575 in Rairakhol, 1533 in Jharsuguda and 1510 plants per ha. in Bargarh. Plant survival rate is highest in Rairakhol (98.4 percent) and lowest in Bargarh (94.4 percent).

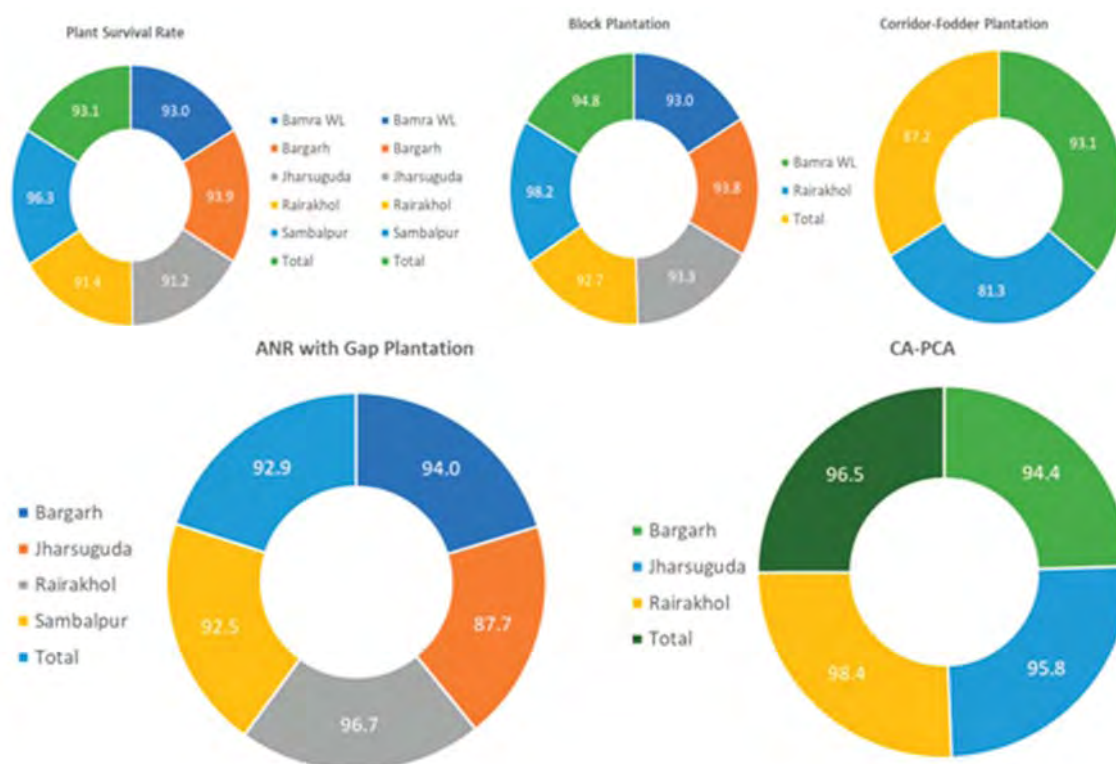


Figure 10:8: Plant Survival Rate by Plantation Categories Division Level



Ranking of sites by plant survival rate reveals that at the circle level about 42.70 percent are in >95 percent survival category, 16.85 percent are in the >93percent & ≤95percent category followed by 17.98 percent in >90 percent to ≤93 percent category. Circle and division wise ranking of plantation sites based on plant survival is presented in the table.

*Table 10.2: Plant Survival Rank by Plantation Categories*

Sambalpur Circle	Plant Survival Rate Rank								Total
	>95	>93<=95	>90<=93	>88<=90	>85<=88	>80<=85	>75<=80	<=70	
ANR with Gap	48.65	10.81	16.22	5.41	8.11	8.11	0.00	2.70	100.00
Bamboo Plantation						40.00	60.00		100.00
Block Plantation	43.59	17.95	25.64	10.26	2.56				100.00
CA PCA	50.00	50.00							100.00
Corridor Fodder Plantation		50.00				50.00			100.00
<b>Total</b>	<b>42.70</b>	<b>16.85</b>	<b>17.98</b>	<b>6.74</b>	<b>4.49</b>	<b>6.74</b>	<b>3.37</b>	<b>1.12</b>	<b>100.00</b>

*Table 10 3: Plant Survival Rank by Plantation Categories by Forest Division*

Division	Plantation Types	>95	>93<=95	>90<=93	>88<=90	>85<=88	>80<=85	>75<=80	<=70	Total
Bamra WL	Block Plantation	18.18	27.27	36.36	18.18					100.00
	Corridor Fodder Plantation		100.00							100.00
	<b>Total</b>	<b>16.67</b>	<b>33.33</b>	<b>33.33</b>	<b>16.67</b>					<b>100.00</b>
Bargarh	ANR with Gap	46.15	7.69	23.08	15.38	7.69				100.00
	Block Plantation	20.00	40.00	20.00	20.00					100.00
	CA PCA		100.00							100.00
	<b>Total</b>	<b>36.84</b>	<b>21.05</b>	<b>21.05</b>	<b>15.79</b>	<b>5.26</b>				<b>100.00</b>
Jharsuguda	ANR with Gap	11.11	11.11	33.33		22.22	11.11		11.11	100.00
	Block Plantation	50.00		25.00	12.50	12.50				100.00
	CA PCA	33.33	66.67							100.00
	<b>Total</b>	<b>30.00</b>	<b>15.00</b>	<b>25.00</b>	<b>5.00</b>	<b>15.00</b>	<b>5.00</b>		<b>5.00</b>	<b>100.00</b>
Rairakhol	ANR with Gap	88.89	11.11							100.00
	Bamboo Plantation						40.00	60.00		100.00
	Block Plantation		33.33	66.67						100.00
	CA PCA	100.00								100.00
	Corridor Fodder Plantation						100.00			100.00
	<b>Total</b>	<b>50.00</b>	<b>10.00</b>	<b>10.00</b>			<b>15.00</b>	<b>15.00</b>		<b>100.00</b>





Division	Plantation Types	>95	>93<=95	>90<=93	>88<=90	>85<=88	>80<=85	>75<=80	<=70	Total
Sambalpur	ANR with Gap	50.00	16.67				33.33			100.00
	Block Plantation	83.33	8.33	8.33						100.00
	Total	72.22	11.11	5.56			11.11			100.00
Total		42.70	16.85	17.98	6.74	4.49	6.74	3.37	1.12	100.00

## 10.8 Canopy Cover:

Canopy cover normally depends upon the age of the plant, species and crown density of the plants. It is observed in the assessment that the canopy cover varies by plantation types and year of plantation. As year of plantation varies along with plant species, canopy cover varies by site and by forest divisions.

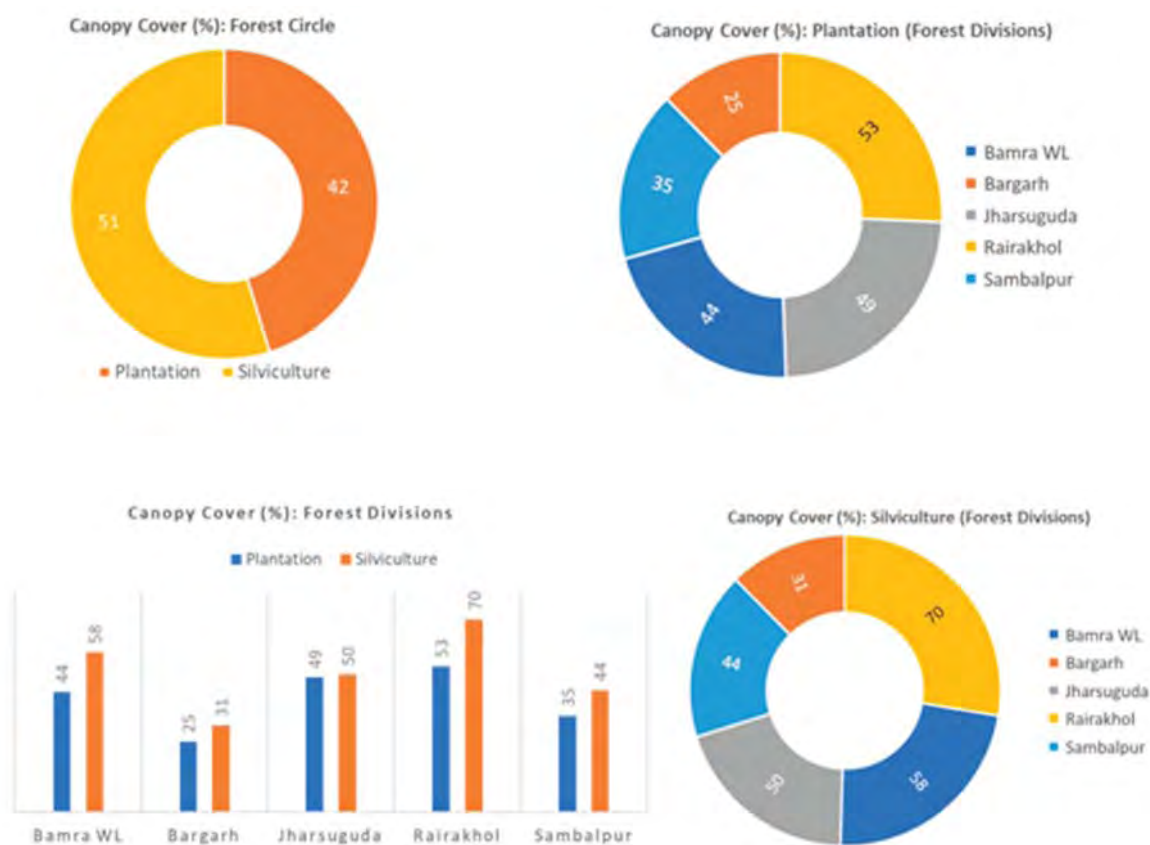


Figure 10:9: Canopy Cover in Forest Circle and Divisions

ANR with enrichment planting (gap plantation, 2014-15) is having a better canopy cover due to existing old plants along with new plants. Lowest canopy cover is also observed in ANR with gap plantation (plant year 2015-16) due to adoption of block plantation mode and absence of old trees. Sites covered under silvicultural operations in many sites have better canopy cover in comparison to plantation sites. Canopy cover of plantation sites (by plantation category) and sites covered under silvicultural operational is presented below in figures and tables.



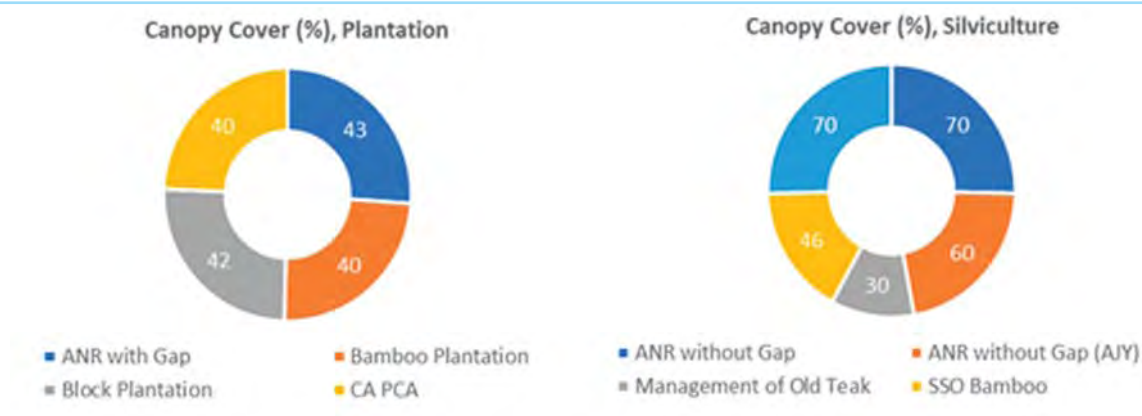


Figure 10:10: Canopy Cover in Plantation and Silvicultural Operations

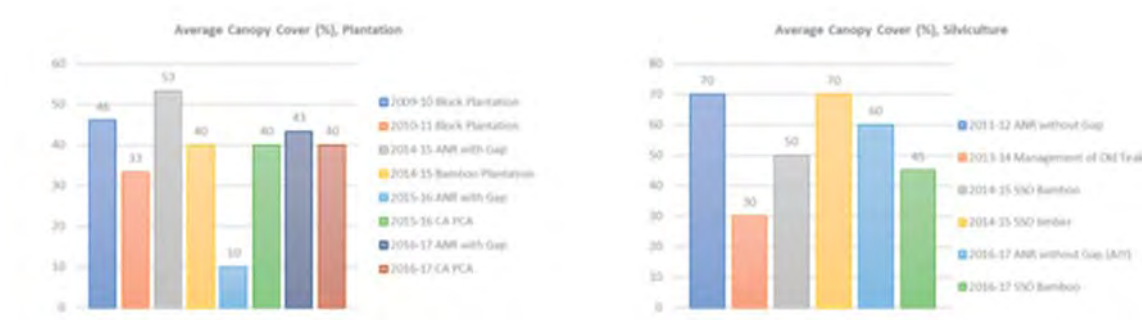


Figure 10:11: Canopy Cover by Plantation Year, Plantation Type and Silvicultural Operations

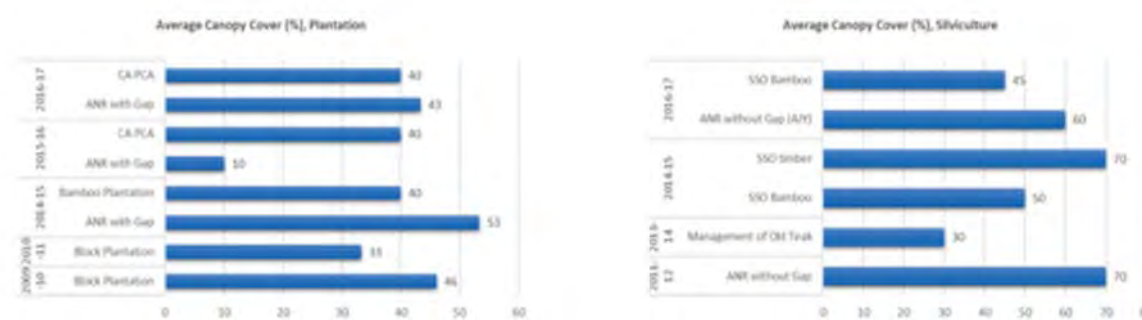


Figure 10:12: Average Canopy Cover (%) in Silviculture and Plantation by Year

Irrespective of the years of plantation, 7.7 percent sites have canopy cover  $\leq 10$  percent and  $>10$  &  $\leq 20$  percent in ANR with gap plantation sites. About 30.8 percent sites have canopy cover in the range of  $>30$  &  $\leq 40$  % range and  $>60$  &  $\leq 70$  %. About 23.1 percent sites have canopy cover in the range of  $>20$  &  $\leq 30$  percent. Bamboo plantation sites have canopy cover in the range of  $>30$  to  $\leq 40$  percent while canopy cover in the block plantation sites having different canopy cover ranges. Canopy cover by plantation and silviculture is presented in the tables below for the circle and forest divisions.



Table 10.4: Canopy Cover by Plantation &amp; Silviculture Types

Sambalpur Circle	Canopy Cover Percent Ranking (% ranking)								Total
Plantation	<=10	>10 & <=20	>20 & <=30	>30 & <=40	>40 & <=50	>50 & <=60	>60 & <=70	>70 & <=80	
ANR with Gap	7.7	7.7	23.1	30.8			30.8		100.0
Bamboo Plantation				100.0					100.0
Block Plantation	11.4		22.9	25.7	11.4	25.7		2.9	100.0
CA PCA				100.0					100.0
Silviculture									
ANR without Gap							100.0		100.0
ANR without Gap (AJY)						100.0			100.0
Management of Old Teak			100.0						100.0
SSO Bamboo		21.7			65.2		13.0		100.0
SSO timber							100.0		100.0

Table 10.5: Ranking of Canopy Cover Percentage by Plantation Categories

Divisions		Canopy Cover Percent Ranking								Total
		<=10	>10 & <=20	>20 & <=30	>30 & <=40	>40 & <=50	>50 & <=60	>60 & <=70	>70 & <=80	
Bamra WL										
Plantation	Block Plantation	36.4					54.5		9.1	100.0
Silviculture	ANR without Gap							100.0		100.0
	ANR without Gap (AJY)						100.0			100.0
	SSO Bamboo					100.0				100.0
Bargarh										
Plantation	ANR with Gap	20.0	20.0	60.0						100.0
	Block Plantation				100.0					100.0
Silviculture	ANR without Gap (AJY)						100.0			100.0
	SSO Bamboo		100.0							100.0





Divisions		Canopy Cover Percent Ranking								Total
		<=10	>10 & <=20	>20 & <=30	>30 & <=40	>40 & <=50	>50 & <=60	>60 & <=70	>70 & <=80	
Jharsuguda										
Plantation	ANR with Gap				50.0			50.0		100.0
	Block Plantation				50.0	50.0				100.0
	CA PCA				100.0					100.0
Silviculture	SSO Bamboo					100.0				100.0
Rairakhol										
Plantation	ANR with Gap							100.0		100.0
	Bamboo Plantation				100.0					100.0
	Block Plantation						100.0			100.0
	CA PCA				100.0					100.0
Silviculture	SSO Bamboo							100.0		100.0
	SSO timber							100.0		100.0
Sambalpur										
Plantation	ANR with Gap				100.0					100.0
	Block Plantation			66.7	33.3					100.0
Silviculture	Management of Old Teak			100.0						100.0
	SSO Bamboo									100.0

## 10.9 Display of Plantation Sites:

Pillars have been installed in different plantation sites, across the forest divisions in the circle. No pillars observed in bamboo plantation sites in Rairakhol forest division. The sites covered under silvicultural operations are also devoid of pillars. No. of pillars have been erected based on the plantation area and shape of the plot. Irrespective of the plantation area, average no. of pillars installed is highest in block plantation (130.67 no.) and lowest in CA-PCA (32.00). Similarly, signboards are erected in different plantation sites and sites covered under silvicultural operations mentioning area of the plantation and other details.



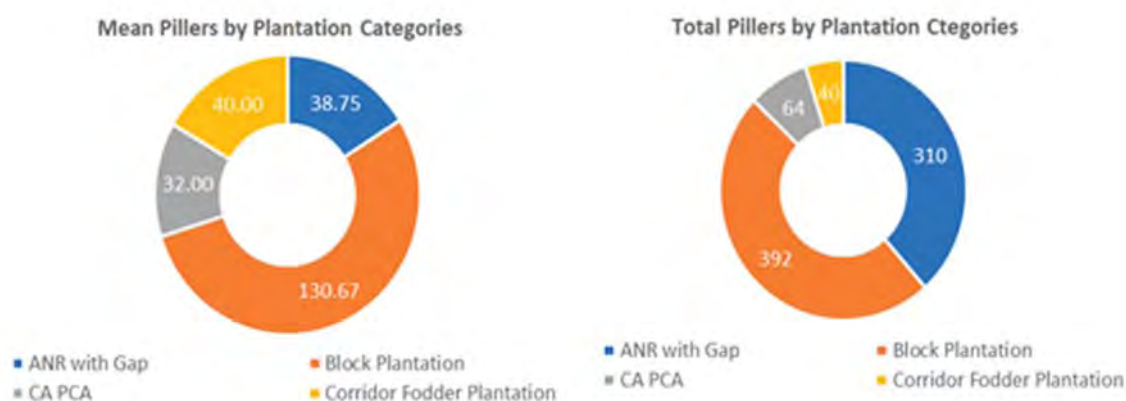


Figure 10.13: Installation of Pillars by Plantation Categories

### 10.10 Soil and Moisture Conservation (SMC) Measures:

Different soil moisture conservation measures have been taken under CAMPA in both plantation sites and area under silvicultural operations. Different SMC works have been taken up based on its locational suitability and assessed requirements. Different SMC activities taken up in plantation sites are staggered trench, half-moon trench, LBCD and percolation pits. In sites under silvicultural operation, emphasis is given to half-moon trench, stone packing and staggered trench construction.

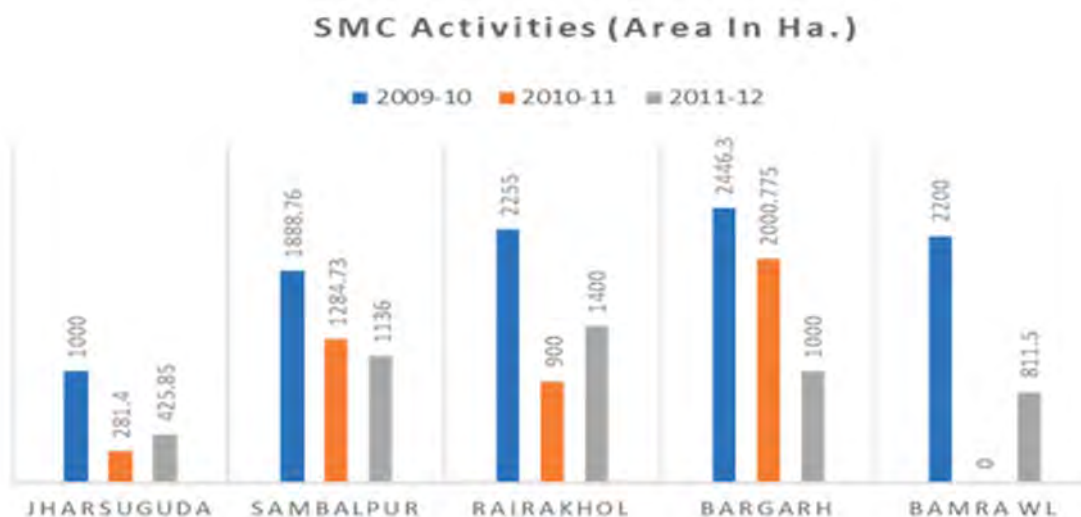


Figure 10.14: SMC Works in Forest Divisions (Source: Forest & Environment Dept.)

In ANR with enrichment plantation, mostly staggered trench, LBCD structures and percolation pits are constructed. Percolation pit and staggered trench also dominant SMC works taken up in block plantation areas. Percolation pits are also constructed in corridor-fodder plantation sites. In silvicultural operations, half-moon trench and stone packing are the major works taken up in different forest divisions. More than one SMC works have also been taken up in different plantation and silvicultural sites in the forest circle.





Figure 10:15: SMC Works by Forest Circle and Division

Table 10.6: Number of SMC Works

Circle	Plantation / Silviculture	SMC Works		
Sambalpur		Single SMC Work	2 SMC Works	3 SMC Works
		1	2	3
Plantation	ANR with Gap	✓	✓	✓
	Block Plantation	✓	✓	
	CA PCA	✓		
	Corridor Fodder Plantation	✓		
Silviculture	ANR without Gap (AJY)		✓	✓
	SSO Bamboo	✓	✓	

SMC works have been done in all the plantation sites in the circle, excluding bamboo plantation site. Whereas, SMC works in silvicultural operations have been taken up in sites covered under ANR without gap (AJY) and SSO-Bamboo. No SMC work observed in silviculture operational areas like old teak management site and SSO timber.

Table 10.7: Single and Multiple SMC Works in Plantation &amp; Silviculture Sites

Circle	Site No.		SMC Works		
Sambalpur			Single	Double	Triple
Plantation	S11	Block Plantation		✓	
	S12	ANR with Gap		✓	
	S13	Block Plantation	✓		
	S16	ANR with Gap	✓		
	S17	CA PCA	✓		
	S18	ANR with Gap		✓	
	S2	CA PCA	✓		





Circle	Site No.		SMC Works		
Sambalpur			Single	Double	Triple
	S23	ANR with Gap	√		
	S24	ANR with Gap	√		
	S25	Block Plantation	√		
	S26	ANR with Gap	√		
	S28	ANR with Gap	√		
	S31	Block Plantation		√	
	S32	Block Plantation	√		
	S34	Block Plantation	√		
	S35	Corridor Fodder Plantation	√		
	S36	Block Plantation	√		
	S4	Block Plantation	√		
	S5	ANR with Gap			√
	S7	ANR with Gap	√		
	S9	ANR with Gap			√
Silviculture	S10	SSO Bamboo		√	
	S20	SSO Bamboo	√		
	S29	SSO Bamboo		√	
	S30	ANR without Gap (AJY)			√
	S33	SSO Bamboo		√	
	S38	ANR without Gap (AJY)		√	
	S6	SSO Bamboo		√	

Table 10.8: Type of SMC Works in Different Plantation Sites

Site No.	Category	SMC Works under CAMPA in Plantation & Silviculture Sites				
		Staggered Trench	Half Moon Trench	LBCD	Stone Packing	Percolation Pit
	Plantation					
S11	Block Plantation		√	√		
S12	ANR with Gap	√				√
S13	Block Plantation					√
S16	ANR with Gap	√				
S17	CA PCA	√				
S18	ANR with Gap	√		√		
S2	CA PCA	√				
S23	ANR with Gap	√				
S24	ANR with Gap	√				



Site No.	Category	SMC Works under CAMPA in Plantation & Silviculture Sites				
		Staggered Trench	Half Moon Trench	LBCD	Stone Packing	Percolation Pit
S25	Block Plantation	√				
S26	ANR with Gap	√				
S28	ANR with Gap	√				
S31	Block Plantation	√				√
S32	Block Plantation					√
S34	Block Plantation					√
S35	Corridor Fodder Plantation					√
S36	Block Plantation					√
S4	Block Plantation	√				
S5	ANR with Gap		√	√		√
S7	ANR with Gap					√
S9	ANR with Gap	√		√		√
	Silviculture					
S10	SSO Bamboo		√		√	
S20	SSO Bamboo		√			
S29	SSO Bamboo	√	√			
S30	ANR without Gap (AJY)	√		√		√
S33	SSO Bamboo		√		√	
S38	ANR without Gap (AJY)	√				√
S6	SSO Bamboo		√		√	

### 10.11 Plant Height and GBH/GCH:

Height of the plants and girth of the plants of different species were measured to understand the growth factor. Growth of the plant by height and girth also represents the cultural practices and measures taken for ensuring appropriate nurturing of the plantation sites. The mean maximum height of the plants, irrespective of the year of plantation and plant species, calculated to be 3.7 mt. and 16.1 mt. in case of plants covered under silvicultural operations. The mean minimum height of the plants at the circle level found to be 1.9 mt. for the plantation sites and 13.5 mt. for the sites covered under silvicultural operations. Similarly, In case of plantation, mean maximum GBH/GCH has been 16.9 cm and mean minimum GBH/GCH has been 8.6 cm. Mean maximum and mean minimum GBH/GCH of plants under silvicultural operations found to be 138.1 cm and 114.6 cm respectively.



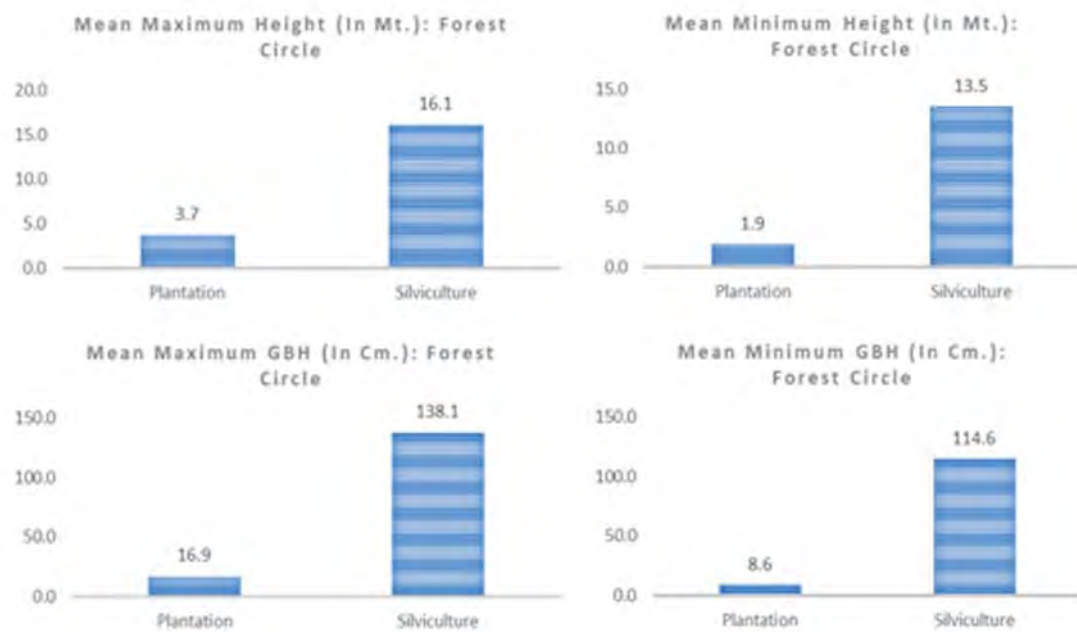


Figure 10:16: Height and GBH/GCH of Plants at Forest Circle Level

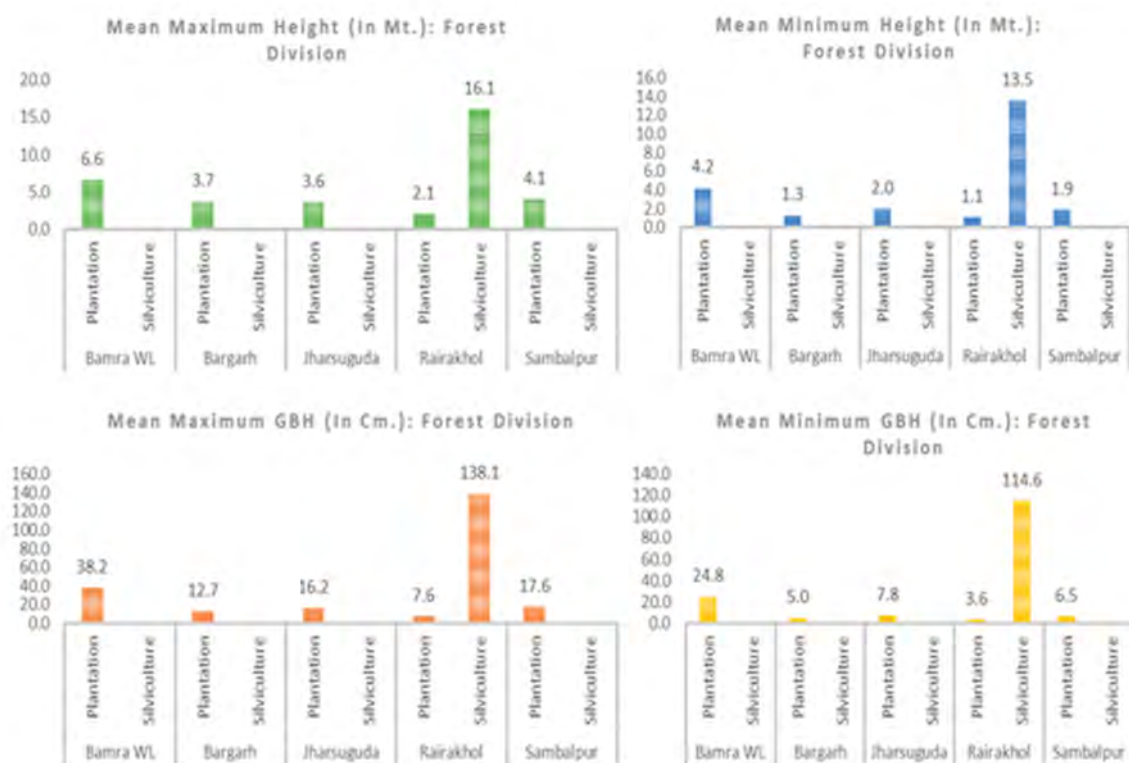
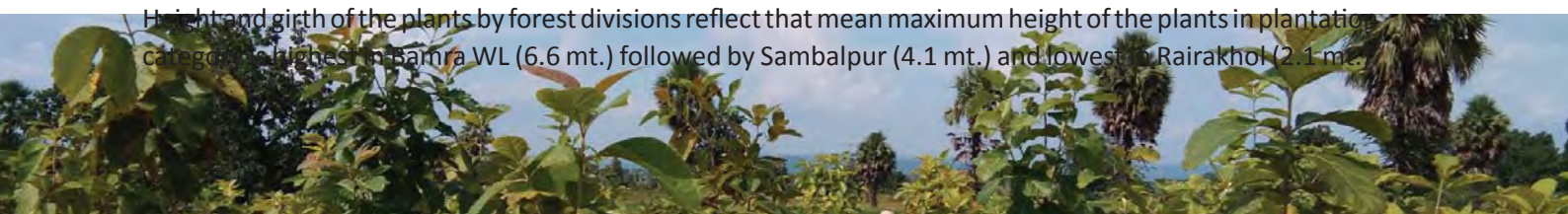


Figure 10:17: Height and GBH/GCH of Plants at Forest Division Level

Height and girth of the plants by forest divisions reflect that mean maximum height of the plants in plantation category is highest in Bamra WL (6.6 mt.) followed by Sambalpur (4.1 mt.) and lowest in Rairakhol (2.1 mt.).





In mean minimum height, Bamra WL is highest with 4.2 mt. and Rairakhol is lowest with 1.1 mt. Similarly, in case of mean maximum and mean minimum GBH/GCH, Bamra WL is the highest among all the forest divisions. Details are presented and discussed below.

The mean maximum and mean minimum height of the plants planted under different plantation works along with sites covered under silvicultural operations is presented in the diagram. Similarly, the GBH/GCH of plants, including plants covered under silvicultural operations is presented in the diagram.

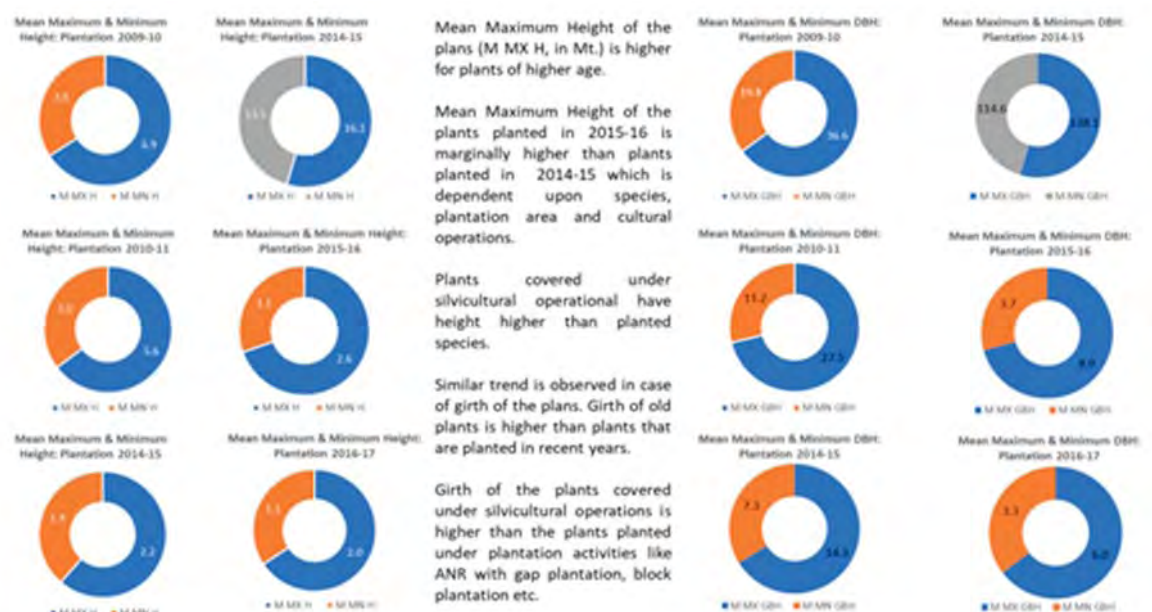
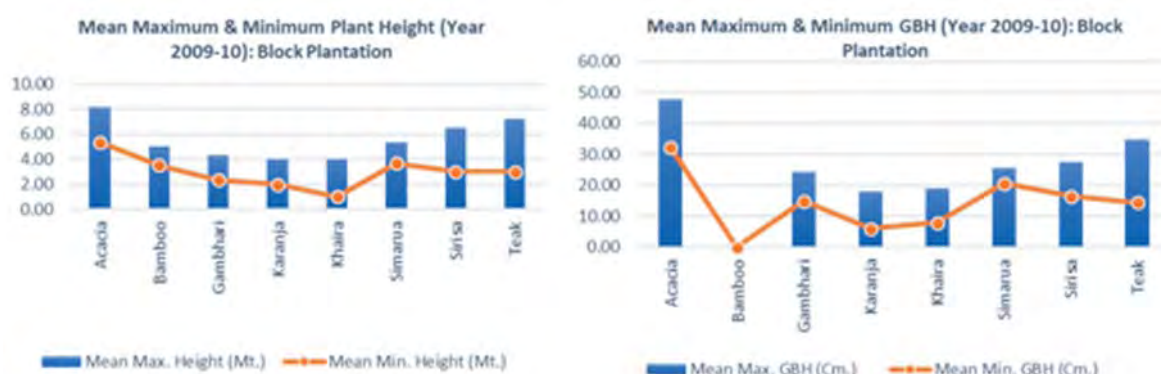


Figure 10:18: Year & Forest Division Wise Plant Height and GBH/GCH



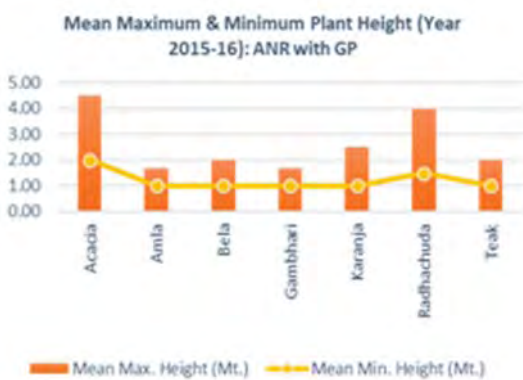
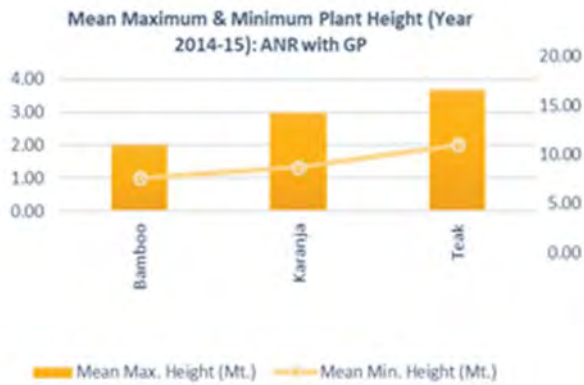
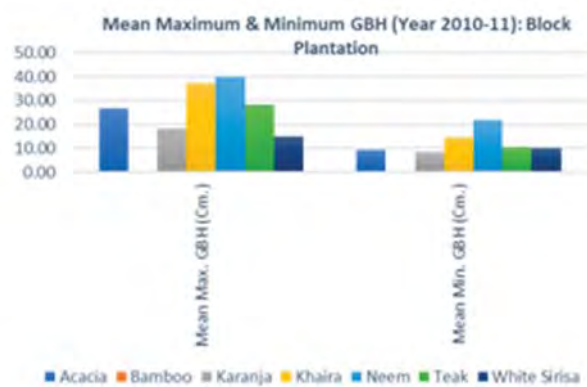
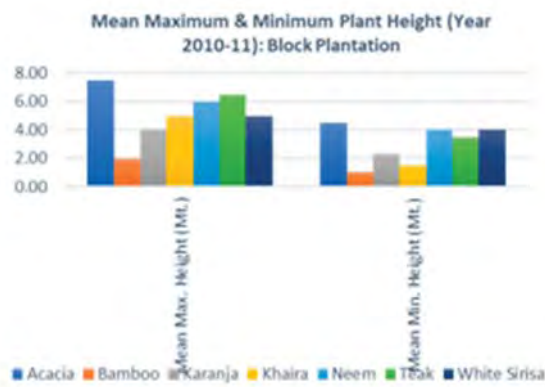
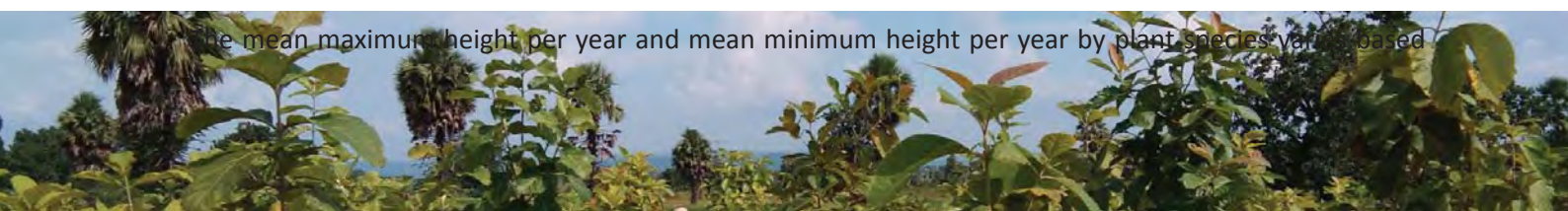






Figure 10:19: Mean Minimum and Maximum Height and GBH/GCH by Plant Categories

The mean maximum height per year and mean minimum height per year by plant species year wise based





on factors like climatic conditions, land suitability, soil types etc. Irrespective of the plant species, mean maximum height per year of the plants found to be 0.7 mt. and mean minimum height of the plants per year observed to be 0.3 mt. Highest of mean maximum height among the plants found to be in Maha neem and Radhachuda. Lowest mean maximum height observed in case of Bamboo, Chakunda etc.

Similarly, mean maximum GBH/GCH of the plants per year, irrespective of the plant types observed to be 2.6 cm. and mean minimum GBH/GCH of the plants per year calculated to be 1.0 cm.



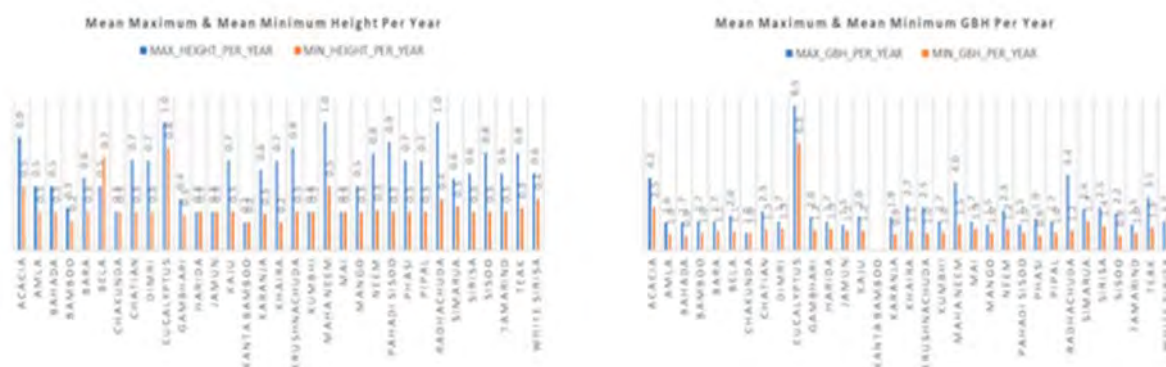


Figure 10:20: Per Year Mean Maximum & Minimum Growth in Height and GBH/GCH

Plants by year of plantation and related height (mt.) ranks is presented in the table. Some plants have substantial growth based on year of plantation in different divisions like Asana, Char, Sal and Sisoo. Plants like Teak also reflects good growth in different sites. Ranking of plants by its height and plantation category is presented in the table below.

Table 10.9: Mean Maximum Height of Plants by Plantation Year

Sambalpur		R.1	R.2	R.3	R.4	R.5	R.6	R.7	Total
Plants		<=2	>2 & <=5	>5 & <=8	>8 &<=11	>11 &<=14	>14 &<=17	>17 &<=20	
Acacia	2009-10			72.7	27.3				100.0
	2010-11			50.0	50.0				100.0
	2015-16		100.0						100.0
	2016-17		100.0						100.0
Amla	2015-16	60.0	40.0						100.0
	2016-17	100.0							100.0
Asana	2014-15						100.0		100.0
Bahada	2016-17	100.0							100.0
Bamboo	2009-10		50.0	50.0					100.0
	2010-11	100.0							100.0
	2014-15	100.0							100.0
	2015-16	100.0							100.0
	2016-17	100.0							100.0
Bara	2016-17	100.0							100.0
Bela	2015-16	100.0							100.0
	2016-17	100.0							100.0
Bhija	2014-15					100.0			100.0
Chakunda	2016-17	100.0							100.0
Chara	2014-15						100.0		100.0
Chatian	2015-16	100.0							100.0
	2016-17	88.9	11.1						100.0



Sambalpur		R.1	R.2	R.3	R.4	R.5	R.6	R.7	Total
Plants		<=2	>2 & <=5	>5 & <=8	>8 &<=11	>11 &<=14	>14 &<=17	>17 &<=20	
Dimri	2016-17	100.0							100.0
Gambhari	2009-10		100.0						100.0
	2015-16	100.0							100.0
	2016-17	100.0							100.0
Harida	2016-17	100.0							100.0
Jamun	2016-17	100.0							100.0
Kaju	2016-17	100.0							100.0
Kanta Bamboo	2014-15	100.0							100.0
	2016-17	100.0							100.0
Karanja	2009-10		100.0						100.0
	2010-11		100.0						100.0
	2014-15		100.0						100.0
	2015-16	60.0	40.0						100.0
	2016-17	75.0	25.0						100.0
Khaira	2009-10		100.0						100.0
	2010-11		100.0						100.0
	2015-16		100.0						100.0
	2016-17		100.0						100.0
Krushnachuda	2015-16		100.0						100.0
Kumbhi	2016-17	100.0							100.0
Maha Neem	2015-16		100.0						100.0
Mai	2016-17	100.0							100.0
Mango	2016-17	100.0							100.0
Neem	2010-11			100.0					100.0
	2016-17	77.8	22.2						100.0
Pahadi Sisoo	2016-17	50.0	50.0						100.0
Phasi	2016-17	100.0							100.0
Pipal	2016-17	100.0							100.0
Radhachuda	2015-16		100.0						100.0
Sal	2014-15						33.3	66.7	100.0
Simaruba	2009-10		66.7	33.3					100.0
	2015-16	100.0							100.0
	2016-17	100.0							100.0
Sirisa	2009-10			100.0					100.0
	2015-16	100.0							100.0
Sisoo	2014-15						100.0		100.0
	2015-16		100.0						100.0
	2016-17	80.0	20.0						100.0
Tamarind	2016-17	100.0							100.0





Sambalpur		R.1	R.2	R.3	R.4	R.5	R.6	R.7	Total
Plants		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14	>14 & <=17	>17 & <=20	
Teak	2009-10		11.5	73.1	15.4				100.0
	2010-11		36.4	63.6					100.0
	2014-15		100.0						100.0
	2015-16	100.0							100.0
	2016-17	21.4	78.6						100.0
White Sirisa	2010-11		100.0						100.0

Table 10.10: Mean Maximum Height of Plants by Plantation Type and Year

Sambalpur		1	2	3	4	5	6	7	Total
		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14	>14 & <=17	>17 & <=20	
<b>ANR with Gap</b>									
Acacia	2015-16		100						100
	2016-17		100						100
Amla	2015-16	100							100
	2016-17	100							100
Bahada	2016-17	100							100
Bamboo	2014-15	100							100
	2016-17	100							100
Bara	2016-17	100							100
Bela	2015-16	100							100
	2016-17	100							100
Chatian	2016-17	87.5	12.5						100
Gambhari	2015-16	100							100
	2016-17	100							100
Jamun	2016-17	100							100
Kaju	2016-17	100							100
Karanja	2014-15		100						100
	2015-16	50	50						100
	2016-17	75	25						100
Khaira	2016-17		100						100
Mango	2016-17	100							100
Neem	2016-17	85.7	14.3						100
Pahadi Sisoo	2016-17	50	50						100
Phasi	2016-17	100							100
Pipal	2016-17	100							100
Radhachuda	2015-16		100						100
Simaruba	2016-17	100							100
Sisoo	2016-17	80	20						100



Sambalpur		1	2	3	4	5	6	7	Total
		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14	>14 & <=17	>17 & <=20	
Tamarind	2016-17	100							100
Teak	2014-15		100						100
	2015-16	100							100
	2016-17	15.4	84.6						100
<b>Bamboo Plantation</b>									
Bamboo	2014-15	100							100
Kanta Bamboo	2014-15	100							100
<b>Block Plantation</b>									
Acacia	2009-10			72.7	27.3				100
	2010-11			50	50				100
Bamboo	2009-10		50	50					100
	2010-11	100							100
Gambhari	2009-10		100						100
Karanja	2009-10		100						100
	2010-11		100						100
Khaira	2009-10		100						100
	2010-11		100						100
Neem	2010-11			100					100
Simaruba	2009-10		66.7	33.3					100
Sirisa	2009-10			100					100
Teak	2009-10		11.5	73.1	15.4				100
	2010-11		36.4	63.6					100
White Sirisa	2010-11		100						100
<b>CA PCA</b>									
Amla	2015-16		100						100
Bamboo	2015-16	100							100
Chatian	2015-16	100							100
	2016-17	100							100
Karanja	2015-16	100							100
Khaira	2015-16		100						100
Krushnachuda	2015-16		100						100
Maha Neem	2015-16		100						100
Neem	2016-17	50	50						100
Simaruba	2015-16	100							100
Sirisa	2015-16	100							100



Sambalpur		1	2	3	4	5	6	7	Total
		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14	>14 & <=17	>17 & <=20	
Sisoo	2015-16		100						100
Teak	2015-16	100							100
	2016-17	100							100
<b>Corridor Fodder Plantation</b>									
Amla	2016-17	100							100
Bahada	2016-17	100							100
Chakunda	2016-17	100							100
Dimri	2016-17	100							100
Gambhari	2016-17	100							100
Harida	2016-17	100							100
Jamun	2016-17	100							100
Kanta Bamboo	2016-17	100							100
Kumbhi	2016-17	100							100
Mai	2016-17	100							100
Mango	2016-17	100							100
Tamarind	2016-17	100							100
<b>SSO timber</b>									
Asana	2014-15						100		100
Bhija	2014-15					100			100
Chara	2014-15						100		100
Sal	2014-15						33.3	66.7	100
Sisoo	2014-15						100		100
<b>Total</b>									
Acacia	2009-10			72.7	27.3				100
	2010-11			50	50				100
	2015-16		100						100
	2016-17		100						100
Amla	2015-16	60	40						100
	2016-17	100							100
Asana	2014-15						100		100
Bahada	2016-17	100							100
Bamboo	2009-10		50	50					100
	2010-11	100							100
	2014-15	100							100
	2015-16	100							100





Sambalpur		1	2	3	4	5	6	7	Total
		<=2	>2 &<=5	>5 &<=8	>8 &<=11	>11 &<=14	>14 &<=17	>17 &<=20	
	2016-17	100							100
Bara	2016-17	100							100
Bela	2015-16	100							100
	2016-17	100							100
Bhija	2014-15					100			100
Chakunda	2016-17	100							100
Chara	2014-15						100		100
Chatian	2015-16	100							100
	2016-17	88.9	11.1						100
Dimri	2016-17	100							100
Gambhari	2009-10		100						100
	2015-16	100							100
	2016-17	100							100
Harida	2016-17	100							100
Jamun	2016-17	100							100
Kaju	2016-17	100							100
Kanta Bamboo	2014-15	100							100
	2016-17	100							100
Karanja	2009-10		100						100
	2010-11		100						100
	2014-15		100						100
	2015-16	60	40						100
	2016-17	75	25						100
Khaira	2009-10		100						100
	2010-11		100						100
	2015-16		100						100
	2016-17		100						100
Krushnachuda	2015-16		100						100
Kumbhi	2016-17	100							100
Maha Neem	2015-16		100						100
Mai	2016-17	100							100
Mango	2016-17	100							100
Neem	2010-11			100					100
	2016-17	77.8	22.2						100
Pahadi Sisoo	2016-17	50	50						100
Phasi	2016-17	100							100
Pipal	2016-17	100							100
Radhachuda	2015-16		100						100



Sambalpur		1	2	3	4	5	6	7	Total
		<=2	>2 & <=5	>5 & <=8	>8 & <=11	>11 & <=14	>14 & <=17	>17 & <=20	
Sal	2014-15						33.3	66.7	100
Simaruba	2009-10		66.7	33.3					100
	2015-16	100							100
	2016-17	100							100
Sirisa	2009-10			100					100
	2015-16	100							100
Sisoo	2014-15						100		100
	2015-16		100						100
	2016-17	80	20						100
Tamarind	2016-17	100							100
Teak	2009-10		11.5	73.1	15.4				100
	2010-11		36.4	63.6					100
	2014-15		100						100
	2015-16	100							100
	2016-17	21.4	78.6						100
White Sirisa	2010-11		100						100

Table 10 11: Mean Minimum Height (mt.) of the Plants by Plantation Categories

Year	Plantations	Ranking of Mean Minimum Height			
		R.1	R.2	R.3	Total
		<=2	>2 & <=5	>5 & <=8	
2009-10	Block Plantation	32.0	54.0	14.0	100.0
2010-11	Block Plantation	40.9	54.5	4.5	100.0
2014-15	ANR with Gap	100.0			100.0
	Bamboo Plantation	100.0			100.0
2015-16	ANR with Gap	100.0			100.0
	CA PCA	100.0			100.0
2016-17	ANR with Gap	98.5		1.5	100.0
	CA PCA	100.0			100.0
	Corridor Fodder Plantation	100.0			100.0
Total	ANR with Gap	99.0		1.0	100.0
	Bamboo Plantation	100.0			100.0
	Block Plantation	34.7	54.2	11.1	100.0
	CA PCA	100.0			100.0
	Corridor Fodder Plantation	100.0			100.0



Table 10 12: Mean Maximum GBH/GCH (cm.) of the Plants by Plantation Categories

Year	Plantation Types	Ranking of Mean Maximum GBH/GCH Value								Total
		R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	
		<5	>5 & <=10	>10 & <=20	>20 & <=30	>30 & <=45	>45 & <=60	>60 & <=80	>80 & <=100	
2009-10	Block Plantation	4.0	0.0	12.0	24.0	42.0	6.0	10.0	2.0	100.0
2010-11	Block Plantation	9.1	4.5	31.8	4.5	50.0	0.0	0.0	0.0	100.0
2014-15	ANR with Gap	10.0	30.0	50.0	10.0	0.0	0.0	0.0	0.0	100.0
	Bamboo Plantation	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
2015-16	ANR with Gap	11.1	66.7	22.2	0.0	0.0	0.0	0.0	0.0	100.0
	CA PCA	15.4	61.5	23.1	0.0	0.0	0.0	0.0	0.0	100.0
2016-17	ANR with Gap	47.1	45.6	7.4	0.0	0.0	0.0	0.0	0.0	100.0
	CA PCA	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Corridor Fodder Plantation	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Total	ANR with Gap	36.5	47.9	14.6	1.0	0.0	0.0	0.0	0.0	100.0
	Bamboo Plantation	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	Block Plantation	5.6	1.4	18.1	18.1	44.4	4.2	6.9	1.4	100.0
	CA PCA	11.8	70.6	17.6	0.0	0.0	0.0	0.0	0.0	100.0
	Corridor Fodder Plantation	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0

Table 10 13: Mean Minimum GBH/GCH (cm.) of the Plants by Plantation Categories

Year	Plantation Types	Ranking of Mean Minimum GBH/GCH Value							Total
		1	2	3	4	5	6	7	
		<5	>5 & <=10	>10 & <=20	>20 & <=30	>30 & <=45	>45 & <=60	>60 & <=80	
2009-10	Block Plantation	8.0	26.0	28.0	22.0	10.0	4.0	2.0	100.0
2010-11	Block Plantation	31.8	13.6	50.0	4.5				100.0
2014-15	ANR with Gap	40.0	60.0						100.0
	Bamboo Plantation	100.0							100.0





Year	Plantation Types	Ranking of Mean Minimum GBH/GCH Value							Total
		1	2	3	4	5	6	7	
		<5	>5 & ≤10	>10 & ≤20	>20 & ≤30	>30 & ≤45	>45 & ≤60	>60 & ≤80	
2015-16	ANR with Gap	100.0							100.0
	CA PCA	92.3	7.7						100.0
2016-17	ANR with Gap	98.5	1.5						100.0
	CA PCA	100.0							100.0
	Corridor Fodder Plantation	100.0							100.0
Total	ANR with Gap	92.7	7.3						100.0
	Bamboo Plantation	100.0							100.0
	Block Plantation	15.3	22.2	34.7	16.7	6.9	2.8	1.4	100.0
	CA PCA	94.1	5.9						100.0
	Corridor Fodder Plantation	100.0							100.0

### 10.12 Plant Protection Measures:

Different plant protection measures have been taken in all the forest divisions to improve plant survival rate. Plant protection measures taken are like fencing, fire protection measures, watch and ward etc. In certain cases, villages and VSS have been found taking care of the local forest area and plantation sites. At the circle level, covering all the forest divisions, it is found that high emphasis is given to watch and ward among all the protection measures, irrespective of the year of plantation. Fire protection and fencing is minimal excluding a few cases.

### 10.13 Record Keeping and Documentation:

Different records / documents are maintained at the range office level with respect to plantation activities, such as plantation journal, plantation site map, treatment map and other registers. Micro plan is found not prepared for plantation activities and only under AJY, preparation of micro plan is observed. Details are presented in the diagram.





Figure 10:21: Plantation Journal



Figure 10:22: Map of Plantation Sites

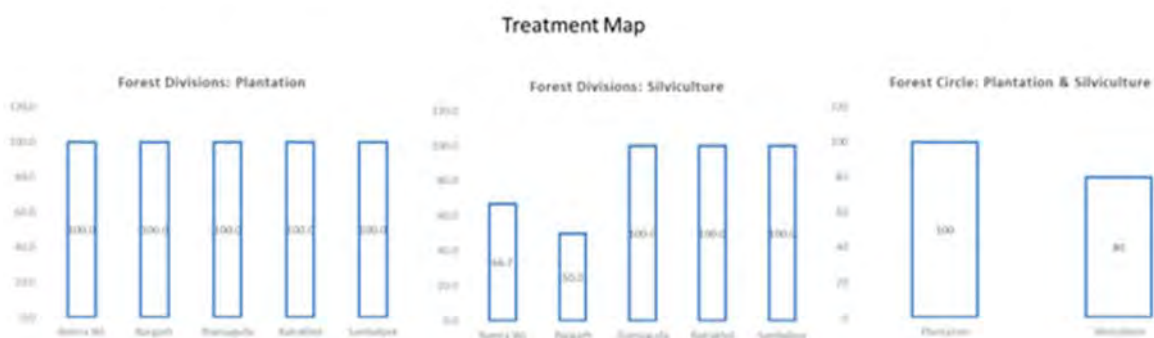


Figure 10:23: Treatment Map

### 10.14 Ama jungle Yojna

Out of six forest divisions in Sambalpur circle, AJY is promoted under CAMPA in three forest divisions Rairakhol, Baragarh & Bamra Wild Life. Basing on the information obtained from three sample AJYs, it is found that all the functioning VSSs involved in AJY are adhering CAMPA guidelines in their day to day operations. There are pre planning before undertaking plantation activities. The VSS members were found involved in various stages of activities. They maintain good relationship with forest department officials.



Table 10.14: Type of Involvement in Plantation Activities

Sl. No.	Name of the VSS / Division/ Range/ Section/ Beat/ Village	Number of Sampled out VSSs					
		Following CAMPA guidelines	Pre planning	Involvement in various stages	Proper Project planning	Proper Project Implementation Plans	Good relationship and cooperation with department people
1	Belbahali Vss Baragarh/ Bhatil/ Bhatil/ Saradabali/ Belbahali	Yes	Yes	Yes	Yes	Yes	Yes
2	Sadamunda VSS Rairakhol/ Rairakhol/ Rairakhol/ Rairakhol / Sadamunda	Yes	Yes	Yes	Yes	Yes	Yes
3	Oram Nikitimal VSS Bamra WL/ Kuchinda/ Kusumi/Laidaguda/ Oram Nikitimal	Yes	Yes	Yes	Yes	Yes	Yes

### 10.14.1 Practices followed

It was found that the VSSs are regularly conducting meetings and attendance rate in the meetings is found average. Records and registers are properly maintained. The wage payment for the labourers is made in cash on daily basis.

Table 10.15: Practices followed by VSSs for AJY led Plantation

Sl.	Name of the VSS / Division/ Range/ Section/ Beat/ Village	Frequency of JFM meeting	Attendance rate in meeting	Held of awareness prog	Maintenance of VSS Register	Wage payment system	Mode of payment
1	Belbahali Vss Baragarh/ Bhatil/ Bhatil/ Saradabali/ Belbahali	Always	Average	No	Properly maintained	Daily	Bank Account
2	Sadamunda VSS Rairakhol/ Rairakhol/ Rairakhol/ Rairakhol / Sadamunda	Always	Average	No	Properly maintained	Daily	Cash
3	Oram Nikitimal VSS Bamra WL/ Kuchinda/ Kusumi/ Laidaguda/ Oram Nikitimal	Always	Average	No	Properly maintained	Daily	Bank Account





### 10.14.2 Impacts of CAMPA

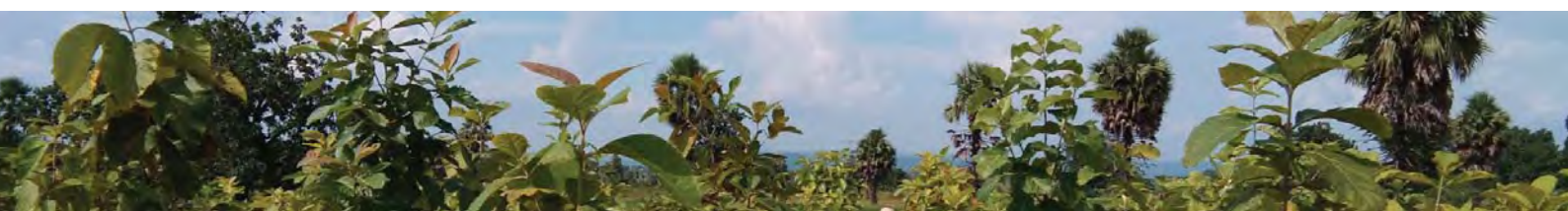
Due to CAMPA support, status of plantation is found to have been improved in all the VSS areas, and frequency of forest fire incidences is not witnessed. Frequency human animal conflict is not reported. Due to CAMPA supported plantation and SMC works, water level in forest fringe villages tended to increase.

Table 10.16: Impact of CAMPA

Sl.	Name of the VSS / Division/ Range/ Section/ Beat/ Village	Status of plantation	Fire incidences	Practice of Podu cultivation	Frequency the human Animal conflict	Change of water level after plantation under CAMPA
1	Belbahali Vss Baragarh/ Bhatil/ Bhatil/ Saradabali/ Belbahali	Labour	Rarely	No	Never	Increased
2	Sadamunda VSS Rairakhol/ Rairakhol/ Rairakhol/ Rairakhol / Sadamunda	Labour	Never	No	Never	Increased
3	Oram Nikitimal VSS Bamra WL/ Kuchinda/ Kusumi/ Laidaguda/ Oram Nikitimal	Labour	Never	No	Never	Increased

### 10.15 Observations:

Type of Assets	Observations (Bamra WL)
Block Plantation (Kuchinda WL/ Kusumi/Laidaguda) (30 Ha)	<ul style="list-style-type: none"> <li>Major tree species observed in the plantation site are Acacia, Tectona grandis (Teak) and Eucalyptus (Nilgiri) with canopy coverage around 60%.</li> <li>No SMC work is undertaken in the site, thereby SMC works may be undertaken to prevent soil erosion.</li> </ul>
Block Plantation (Kuchinda WL/ Kusumi/Laidaguda) (20 Ha)	<ul style="list-style-type: none"> <li>Tree species observed in the plantation site are Accacia, Tectona grandis (Teak), Albizia lebbeck (Sirisa) and Dendrocalamus strictus (Salia Bamboo) with canopy cover around 80%.</li> <li>Unwanted bush removal &amp; weeding activities may be done to improve better growth.</li> </ul>
SSO Bamboo (Jamankira WL/ Bhojpur/ Sirid)	<ul style="list-style-type: none"> <li>SSO work is done for previous bamboo plantation.</li> <li>Height of bamboo seems to be of medium range.</li> <li>3 Half moon trench and soil bunding SMC measures are observed in all sites and the intervention has improved the soil moisture.</li> </ul>
Block Plantation (Bamra WL/ Gasposh/ Sagra)	<ul style="list-style-type: none"> <li>Major tree species observed in the plantation site are Acacia, Tectona grandis (Teak) and Albizia lebbeck (Sirisa) with canopy cover around 50%.</li> <li>Watch &amp; ward provision is there for initial four years. Afterwards only general protection provisions are provided by forest officials.</li> </ul>



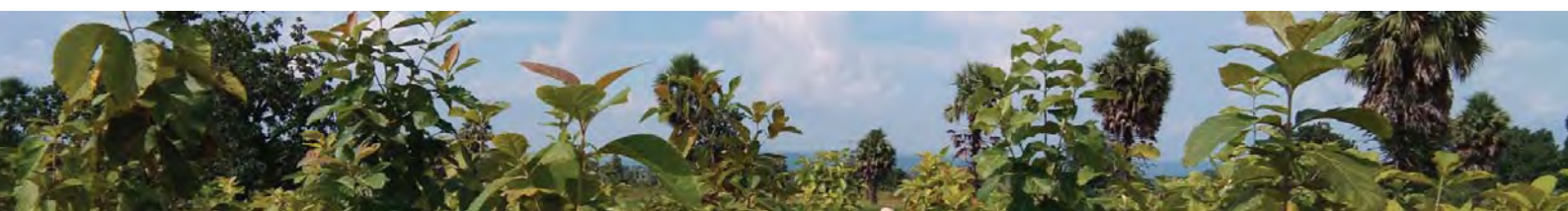
Type of Assets	Observations (Bamra WL)
Fodder Plantation (Bamra WL/ Gadposh/ Kinabaga)	<ul style="list-style-type: none"> <li>Major fodder species observed are Tamarindus indica (Tamarind), Gmelina arborea (Gambhari), Leucaena leucocephala (Subahu) &amp; Bambusa bambos (Kanta Bamboo).</li> <li>Most of the Gmelina arborea (Gambhari) plants are damaged by cattle of nearby localities.</li> <li>Appropriate protection measures may be undertaken.</li> </ul>
Block Plantation (Bamra WL/ Kholilung/ Goeljhump)	<ul style="list-style-type: none"> <li>Major tree species observed in the plantation site are Acacia, Tectona grandis (Teak).</li> <li>Regeneration of indigenous plant species were also observed in plantation sites.</li> <li>Weeding, pruning operation would enhance better growth of planted species.</li> </ul>
ANR without Gap-Silviculture & SMC (Bamra WL/ Gadposh/ Sargad)	<ul style="list-style-type: none"> <li>Major species Shorea robusta (Sal), Buchanania Lanza (Chara), Semecarpus anacardium (Bhalia), Pterocarpus marsupium (Piasal), Sphaeranthus indicus L. (Mundi), Kuruma, Anogeissus latifolia (Dhaura), Syzygium cumini (Jamun), Madhuca longifolia (Mahula), Azadirachta indica (Neem), Diospyros Melanoxylon (Kendu), Carthamus tinctorius (Kusum), Phyllanthus emblica (Amla) are observed in the site.</li> <li>After silviculture intervention, green cover increased as well as conservation of wildlife have been promoted.</li> </ul>
ANR without Gap AJY (Kuchinda/ Kusumi/ Laidaguda)	<ul style="list-style-type: none"> <li>VSS members are trained for PRA exercise, micro plan preparation, SHG Linkages, livelihood promotion under AJY guidelines.</li> <li>Total families involved in the VSS are 63. Total members of executive committee are 17 including president, vice-president and treasurer.</li> <li>The VSS was organising meetings in regular intervals and also as per their requirement.</li> <li>Total 3000 number of staggered trench and percolation pit were dug by VSS and payment was made within one week.</li> <li>Erosion of upper soil layer is observed in few degraded forest sites. However, ANR practices have been conducted in those sites to improve soil condition.</li> </ul>

Type of Assets	Observations (Bargarh Division)
ANR with Gap (Paikamal/ Jharbandh/ Jharbandh)	<ul style="list-style-type: none"> <li>Before plantation activity ANR site under Paikmal range was totally barren having hilly and rocky patches. Post intervention green cover of the site is significantly increased.</li> <li>Major tree species observed in the plantation site are Tectona grandis (Teak), Millettia pinnata (karanja), Gmelina arborea (Gambhari) and Phyllanthus emblica (Amla).</li> <li>Other indigenous plants observed in the sampled plot are Butea monosperma (Palasa), Azadirachta indica (Neem), Justicia adhatoda (Sidha), Brideli retusa (Kasi), Diospyros Melanoxylon (Kendu).</li> </ul>
ANR with Gap (Paikamal/ Jharbandh/ Laudidhara)	<ul style="list-style-type: none"> <li>Proper site selection for plantation has been beneficial to arrest soil erosion and reduce forest degradation.</li> <li>Major tree species observed in the plantation site are Tectona grandis (Teak), Millettia pinnata (karanja).</li> <li>Other indigenous plants observed in the sampled plot are Butea monosperma (Palasa), Azadirachta indica (Neem), Diospyros Melanoxylon (Kendu), Karda, Chara, Mahula, Asana, Justicia adhatoda (Sidha), Anogeissus Latifolia (Dhaura), Kusum, Harida.</li> <li>A VSS group is also working for protection and management of plantation site. VSS has been formed during the year 2018-19 and its performance was observed satisfactory.</li> </ul>
Block Plantation (Ghens/ Melchamunda/ Barpadar)	<ul style="list-style-type: none"> <li>Green cover has significantly increased in this site.</li> <li>Local VSS has been engaged for protection of the site since 2017-18.</li> <li>Growth of the trees was observed to be good and soil conservation measures have helped to control erosion.</li> <li>The installed sign board was found to be broken due to elephant movement and that create problems in proper identification of site.</li> <li>Pruning and weeding seems to be required for the better growth of the plants.</li> </ul>



Type of Assets	Observations (Bargarh Division)
ANR with Gap (Ghens/ Sohela/ Sargunapali)	<ul style="list-style-type: none"> <li>Due to plantation activities, green cover of the treatment area is significantly increased.</li> <li>Focus has been given for fire line formation inside as well as periphery of the site.</li> <li>Tectona grandis (Teak) is the dominant species among all planted species.</li> <li>Some areas of the sites are entirely stony and it causes slow growth of plants.</li> <li>Other regenerated species found in the site are Buchnanea lanzan (Chara), Azadirachta indica (Neem), Anogeissus Latifolia (Dhaura), Delbergia latifolia (Pahadi sisoo), Terminalla bellirica (Bahada), Holarrhena antidysenterica (Kurei), Garuga Pinnata (Kekat), Acacia catechu (Khaira), Mitragyna parviflora (Mundi), Legerstroemia Parviflora (Senha) etc.</li> </ul>
CA-Block plantation (Ghens/ Bijepur/ Bijepur)	<ul style="list-style-type: none"> <li>Weed removal around trees have been done properly.</li> <li>Protection provision should be extended beyond 4 years until plants attained full grown.</li> <li>The site demarcation and fencing are done by highway authority of India. Compensation fund was given for 4 lane highway expansion.</li> <li>Barbed wire fencing is provided around the plantation site.</li> </ul>
ANR with Gap (Bhatli/ Dwari/ Kumbho)	<ul style="list-style-type: none"> <li>Tectona grandis (Teak) is the dominant species among all planted species.</li> <li>Silvicultural operations like pruning, thinning and weed removal are required for growth of teak and other species.</li> <li>As this site is fire prone, due focus has been given for fire line creation and maintenance. It helped in reducing fire incidence in the site.</li> <li>Other regenerated species found in the site are Buchnanea lanzan (Chara), Azadirachta indica (Neem), Anogeissus Latifolia (Dhaura), Holarrhena antidysenterica (Kurei), Garuga Pinnata (Kekat), Mitragyna parviflora (Mundi), Legerstroemia Parviflora (Senha) etc.</li> </ul>
SSO Bamboo (Bhatli/ Dungri/ Badmal)	<ul style="list-style-type: none"> <li>For site demarcation purpose, double coal tar ring pillars are constructed.</li> <li>High stump cutting, congestion removal, thinning works have been done in the site.</li> <li>Along with other factors, due to irregular rainfall, less no of bamboo shoots are observed during monsoon season.</li> </ul>

Type of Assets	Observations (Jharsuguda)
Block Plantation (Brajarajnagar/ Brajarajnagar/ Ulap)	<ul style="list-style-type: none"> <li>Survival rate of plants are above 95%. Height and girth of trees are significantly good.</li> <li>Damage of tree barks due to termite attack is observed in few sites.</li> <li>Growth of some plant species like Tectona Grandis (Teak), Azadirachta indica (Neem), Millettia pinnata (karanja) are good except Albizia lebbeck (Sirisa).</li> <li>Pruning and thinning operation can be done for good growth of existing plants.</li> </ul>
CA PCA (Brajarajnagar/ Banbahal/ Banbahal)	<ul style="list-style-type: none"> <li>Major tree species observed in the plantation site are Azadirachta indica (Neem) &amp; Alstonia scholaris (Chatiyan).</li> <li>Due to nearby coal mining, layer of ashes are observed on the plants.</li> <li>Growth of plants is impacted due to high temperature and poor air quality.</li> <li>Unwanted weed growth is observed in the site which has direct impact on growth factor.</li> <li>Due to proper protection measures, survivals of plants are observed.</li> </ul>
CA PCA (Belpahar/ Belpahar/ Thingismal)	<ul style="list-style-type: none"> <li>Major tree species found in the plantation site are Tectona Grandis (Teak), Alstonia scholaris (Chatiyan), Millettia pinnata (karanja), Simarouba glauca (Simaruba), Dalbergia sisoo (Sisoo), Mella azedarch (Maha Neem), Albizia lebbeck (Sirisa), Peltophorum pterocarpum (Radhachuda) &amp; Bambusoideae (Bamboo).</li> <li>Survival rate is high and good growth is observed for species like Simarouba glauca (Simaruba), Peltophorum pterocarpum (Radhachuda) and Mella azedarch (Maha Neem).</li> <li>Watch and ward / protection measure is strictly followed as per the norm.</li> </ul>
Block Plantation (Jharsuguda/ Jharsuguda/ Patrapali)	<ul style="list-style-type: none"> <li>Major tree species observed in the plantation site are Tectona grandis (Teak), Acacia and Albizia lebbeck (Sirisa) with canopy cover around 40%.</li> <li>Due to fire incidence crown portion of Albizia lebbeck (Sirisa) trees are burnt confined to a small patch of the site.</li> <li>Regeneration of Tectona grandis (Teak), Albizia lebbeck (Sirisa) are also observed.</li> </ul>





Type of Assets	Observations (Jharsuguda)
ANR with Gap (Jharsuguda/Jharsuguda/Patrapali)	<ul style="list-style-type: none"> <li>Species planted in the site are <i>Tectona grandis</i> (Teak), <i>Azadirachta indica</i> (Neem), <i>Alstonia scholaris</i> (Chatian), <i>Simarouba glauca</i> (Simaruba), <i>Aegle marmelos</i> (Bela), <i>Millettia pinnata</i> (karanja).</li> <li>SMC structures like percolation pits, staggered trenches and LBCDs are measured with 30% siltation.</li> <li>Due to ANR practices, indigenous species like <i>Ochna integerrima</i> (Mai), <i>Buchanania lanzan</i> (Chara), <i>Shorea robusta</i> (Sal), <i>Morinda tinctoria</i> (Achu), <i>Diospyros Melanoxylon</i> (Kendu), <i>Cassia Fistula</i> (Sunari), <i>Terminalia bellirica</i> (Bahada), <i>Soyamida febrifuga</i> (Rohini), <i>Justicia adhatoda</i> (Sidha), <i>Semecarpus anacardium</i> (Bhalia), <i>Terminalia chebula</i> (Harida), <i>Sphaeranthus indicus</i> (Mundi) have been grown in the site.</li> </ul>
SSO Bamboo (Belpahar/Bagmunda/Tangarpali)	<ul style="list-style-type: none"> <li>Since last several years rainfall pattern is intermittent. That impacts growth of bamboo culms.</li> <li>Incidence of forest fire is quite frequent in the site. Damage by elephant is observed.</li> <li>Due attention has been given for undertaking of SMC activities.</li> </ul>
ANR with Gap (Belpahar/Kamdandihi/Jharguon-A)	<ul style="list-style-type: none"> <li>Species planted in the site are <i>Tectona grandis</i> (Teak), <i>Millettia pinnata</i> (karanja), <i>Bambusoideae</i> (Bamboo).</li> <li>Regeneration of species like <i>Shorea robusta</i> (Sal), <i>Pterocarpus marsupium</i> (Asana) is observed in the site and the canopy cover is around 70%.</li> <li>Appropriate fire protection measures and watch &amp; ward provisions have been taken care.</li> </ul>

Type of Assets	Observations (Rairakhol)
Elephant corridor plantation (Badbahal)	<ul style="list-style-type: none"> <li>Major fruit bearing species planted are <i>Mangifera indica</i> (Mango), <i>Tamarindus indica</i> (Tamarind), <i>Careya arborea</i> (Kumbhi), <i>Phyllanthus emblica</i> (Amla), <i>Ficus racemosa</i> (Dimri), <i>Ochna integerrima</i> (Mai), <i>Terminalia chebula</i> (Harida), <i>Syzygium cumini</i> (Jamun), <i>Terminalia bellirica</i> (Bahada).</li> <li>Mortality of <i>Mangifera indica</i> (Mango) is observed high due to exposure of heat and sun.</li> <li>Survival of rest of the species are found good.</li> <li>Mulching can help in preventing soil layer from direct exposure of sun.</li> <li>Soil conditioner can be added for better growth.</li> <li>The selected site has helped in minimizing human animal conflict.</li> </ul>
ANR with Gap (Badmal/Mochibahal/Saiberni)	<ul style="list-style-type: none"> <li>Species adopted for plantation are <i>Tectona grandis</i> (Teak), <i>Acacia catechu</i> (Khaira), <i>Bambusoideae</i> (Bamboo), <i>Dalbergia sisoo</i> (Sisoo), <i>Phyllanthus emblica</i> (Amla), <i>Syzygium cumini</i> (Jamun), <i>Gmelina arborea</i> (Gambhari).</li> <li>Regeneration is observed in indigenous species like <i>Shorea robusta</i> (Sal), <i>Pterocarpus marsupium</i> (Piasal), <i>Diospyros Melanoxylon</i> (Kendu). Canopy coverage is about 80%.</li> <li>Regeneration of trees species like <i>Shorea robusta</i> (Sal), <i>Buchanania lanzan</i> (Chara), <i>Semecarpus anacardium</i> (Bhalia), <i>Pterocarpus marsupium</i> (Piasal), <i>Sphaeranthus indicus</i> L. (Mundi), <i>Kuruma</i>, <i>Anogeissus latifolia</i> (Dhaura), <i>Syzygium cumini</i> (Jamun), <i>Madhuca longifolia</i> (Mahula), <i>Azadirachta indica</i> (Neem), <i>Diospyros Melanoxylon</i> (Kendu), <i>Carthamus tinctorius</i> (Kusum), <i>Phyllanthus emblica</i> (Amla), <i>Anacardium occidentale</i> (Kaju), <i>Curcuma longa</i> (Turmeric), <i>Ochna integerrima</i> (Mai), <i>Couroupita guianensis</i> (Bhurudu Koli), <i>Bridelia squamosa</i> (Kasi) are observed.</li> <li>SMC structures like staggered trench with 30% siltation are observed. Seeds of palm trees are sown near trench where moisture content is high. Due to this measure elephants can get abundant food in the forest thereby human animal conflict can be reduced.</li> </ul>
CA PCA (Badmal/Badmal/Badmal)	<ul style="list-style-type: none"> <li>ANR with Gap</li> <li>(Naktideul/ Janjeri/ Chadchadi)</li> <li>Major planted species are <i>Acacia catechu</i> (Khaira) &amp; <i>Phyllanthus emblica</i> (Amla). Growths of plants are satisfactor.</li> <li>Land identification &amp; demarcation has been done by Power Grid Corporation Ltd.</li> <li>Soil conditioning and casualty replacement have been done after 1st year of plantation for better survival and growth of plants as per the norm.</li> <li>Regular cultural operations like cleaning, cutting and removal of unwanted species may contribute for better growth of the plants.</li> </ul>



Type of Assets	Observations (Rairakhol)
ANR with Gap (Naktideul/ Janjeri/ Chadchadi)	<ul style="list-style-type: none"> <li>Major planted species observed in the site are Azadirachta indica (Neem), Millettia pinnata (karanja), Alstonia scholaris (Chatian), Dalbergia sisoo (Sisoo), Begalensis (Bara), Terminalia bellirica (Bahada), Anacardium occidentale (kaju), Tamarindus indica (Tamarind), Ficus religiosa (Pipal), Mangifera indica (Mango), (Anogeissus acuminata) Phasi.</li> <li>Species diversification is observed in the plantation site.</li> <li>Fruit bearing species are planted for consumption of elephant.</li> <li>Survival of plants is good. Watch &amp; ward provision is present there.</li> <li>Apart from planted trees other indigenous species observed in the site are Syzygium cumini (Jamun), Curcuma longa (Turmeric), Bombax ceiba (Simil), Ochna integerrima (Mai), Diospyros Melanoxylon (Kendu), Madhuca longifolia (Mahula), Justicia adhatoda (Sidha), Couroupita guianensis (Bhurudu Koli), Bridelia squamosa (Kasi), Cassia Fistula (Sunari).</li> <li>LBCD, Staggered trench are present to help in soil moisture conservation.</li> </ul>
SSO Timber (Rairakhol/ Daincha/ Terabada)	<ul style="list-style-type: none"> <li>Different nature of Subsidiary Silviculture Operation works like cleaning, high stump cutting, overlapping cutting etc have been done.</li> <li>Climber cutting work is not done in all sites as climbers are consumed by elephants. This practice helped in controlling human elephant conflicts and restricted the movement of elephants towards habitation.</li> <li>Very less quantity of weed, lantana and other unwanted bush are observed due to proper silvicultural operations.</li> </ul>
SSO Bamboo (Rairakhol/ Daincha/ Terabada)	<ul style="list-style-type: none"> <li>Emergence of 1st year &amp; 2nd year culms are observed. Removal of congestion is done properly.</li> <li>Several SMC works like stone bunding and half-moon trench were helpful to reduce soil erosion and improved moisture conservation.</li> <li>SMC work was helpful for generation of new shoots.</li> <li>Identification of the site seems suitable for bamboo regeneration purpose.</li> </ul>
Block Plantation (Rairakhol/ Luhapank/)	<ul style="list-style-type: none"> <li>Tectona grandis (Teak) is the dominant species among all species.</li> <li>Plantation site has been protected from forest fire.</li> <li>Growth of tree is good with high survivability.</li> <li>Pruning, thinning and weeding work may be done to remove congestion.</li> <li>As per the norm there is watch &amp; ward provision for 4 years. Provisions for more years of watch &amp; ward will facilitate proper supervision, better plant growth and plant survivability.</li> <li>Growths of teak trees are observed to be good as compared to other species.</li> </ul>
Bamboo Plantation (Rairakhol/ Rairakhol/ Rairakhol)	<ul style="list-style-type: none"> <li>Survival of Planted bamboo is good.</li> <li>Growth of bamboo trees is not remarkable due to factors like poor soil quality, inadequate rainfall, and site selection. Plantation can be done near to Bamboo forest fringe as extension to bamboo forest.</li> <li>Species adopted for plantation are Dendrocalamus strictus (Salia Bamboo) and Bambusa bambos (Daba/ Kanta Bamboo).</li> <li>Bamboo saplings used for planting were not of required quality / sufficient height to survive in forest. At least saplings of 1 year old may be taken for bamboo plantation instead of six/ three months old sapling.</li> </ul>

Type of Assets	Observations (Sambalpur)
Block Plantation (Rengali/ Rengali/ Thuntikatar бага)	<ul style="list-style-type: none"> <li>Growth of Acacia catechu (Khaira) &amp; Tectona grandis (Teak) is good.</li> <li>Acacia catechu (Khaira) trees are planted purposefully on the front rows of the plantation patch to protect from herbivorous animals.</li> <li>Other planted species observed are Acacia, Millettia pinnata (karanja) and Bamboo.</li> <li>Erosion of soil is found high &amp; 100% siltation in trenches.</li> <li>The installed sign board is damaged due to road widening work.</li> <li>About 2.5m spacing has been maintained between potted plants.</li> </ul>



ANR with Gap-Enrichment (Rengali/ Bhalubahal/ Pardesi pali)	<ul style="list-style-type: none"> <li>The moisture retention capacity of the soil is less. Hence growth of Acacia &amp; Pterocarpum (Radhachuda) plants are better than other species like Aegle marmelos (Bela), Millettia pinnata (karanja), Alstonia scholaris (Chatian), Syzygium cumini (Jamun), Phyllanthus emblica (Amla), Gmelina arborea (Gambhari).</li> <li>Variety of plant species are adopted for plantation.</li> <li>Green cover of the site increased and SMC works like staggered trench and percolation pits are observed beneficial to arrest soil and moisture.</li> </ul>
SSO Bamboo (Sadar/ Jhankarpali/ Jhankarpali)	<ul style="list-style-type: none"> <li>Clump density is observed high and growth of bamboo culms are significant.</li> <li>As SSO work was done five years back, congestion due to weed / unwanted growths are found at the site.</li> <li>Few Bamboo clumps are damaged and consumed by elephants.</li> <li>All types of SMC work like stone packing, bamboo mat bund and half moon trench are undertaken and those have helped in improving soil moisture.</li> </ul>
Block Plantation (Sadar/ Basiapada/ Jadulisingh)	<ul style="list-style-type: none"> <li>Major tree species observed are Tectona grandis (Teak), Acacia and Millettia pinnata (karanja) with canopy coverage of 40%.</li> <li>Growth of standing trees is good for all species. Only maintenance and weeding is required.</li> <li>Suitable soil moisture conservation work may be undertaken.</li> </ul>
ANR with Gap (Sadar/ Basiapada/ Basiapada)	<ul style="list-style-type: none"> <li>Major species adopted for plantation are Acacia, Tectona grandis (Teak), Millettia pinnata (karanja), Bamboo, Phyllanthus emblica (Amla), Dalbergia sisoo (Sisoo), Aegle marmelos (Bela), Azadirachta indica (Neem).</li> <li>Bamboo saplings are planted in front two rows of the site for fencing purpose.</li> <li>Survivals of all plants are remarkable.</li> <li>The installed sign board is damaged due to movement of elephants. It may be installed for the benefit of all concerned.</li> <li>Removal of weed and unwanted bush is observed to be taken for better growth performance of plantation.</li> <li>Regeneration of other indigenous plants is also observed in the site.</li> </ul>
Block Plantation (Dhama/ Larasara/ Larasara)	<ul style="list-style-type: none"> <li>Tectona grandis (Teak) is the dominant species among all planted species.</li> <li>Height and growth of the trees are good.</li> <li>Survival of the plantation site is remarkable.</li> <li>SMC measures like percolation pits are observed.</li> <li>Installation of pillars and site demarcation is done properly.</li> </ul>
Management of Old Teak (Dhama)	<ul style="list-style-type: none"> <li>Along with Thinning and pruning, other silviculture works were undertaken and it has helped in proper growth of plants.</li> <li>Average Height of the trees is around 17m and girth is 91 cm.</li> <li>LBCD SMC works are observed undertaken in the periphery of the site.</li> </ul>





### Case Study: Promotion of sacred groves is viewed an important step towards the revival of lost ecology



Preservation of Sacred Groves is an ancient strategy to protect biodiversity resources. Rural communities in India especially tribal people treat forests as abodes of deities. Some of them sustain their livelihood from forest. Sacred groves contribute to ground water recharge and often serve as source of water for local villages. During CAMPA evaluation we came across a forest patch which had been preserved by communities for more than 200 years. This forest patch is situated near Baishnabajhuli village under Rairakhol Forest Division commonly known as “Baishnabajhuli Sacred Groves”. Forest Department identified this area and set up as sacred groves under

CAMPA (APO 2016-17). Various works were taken up for promoting this sacred grove like construction of a small temple of deity known as MaaTarini Pitha; plantation of varieties of trees around temple periphery and construction of a tube well at the site. Once in a year during Durga Astami all villagers gather near the temple and offer their prayers for prosperity and preservation of the natural resources.

In another place near the village, ancient trees are protected with barbed wire fencing around it. These trees perform very precious role in preserving the rich biodiversity. During Raksha Bandhan festival, all female members of nearby villages come here to tie a sacred thread called Rakhi and express their gratitude to these ancient trees. From several conversations with villagers it draws the inference that such steps taken by the Forest Department of Odisha contribute a lot towards ground water recharge. During the era of commercial exploitation of natural resources, villagers are of the opinion that promotion of sacred groves plays an important role in the revival of lost ecology.



## 10.16 Other than Plantation

Table 10.17: Usability of Building:

SL No	Type of Assets/ Division/ Range/Section/ Beat	Observations of the Assets	Impact of the Assets	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
1	Forester Quarter/ Jharsuguda/ Brajarajnagar/ Bandhbahal/ Bandhbahal	<ul style="list-style-type: none"> <li>Used by forester of Bandhbahal section</li> <li>PHD water supply from MCL is available</li> <li>Electricity and boundary wall with barbed wire fencing was available</li> </ul>	<ul style="list-style-type: none"> <li>It becomes easier to operate supervision work closely.</li> <li>It provides safe and comfortable dwellings.</li> </ul>	8	High
2	Forest Guard Quarter Jharsuguda Brajarajnagar Bandhbahal Bandhbahal	<ul style="list-style-type: none"> <li>Used by forest guard of Badhbahal beat</li> <li>PHD water supply from MCL is available. Electricity and boundary wall with barbed wire fencing was available</li> </ul>	<ul style="list-style-type: none"> <li>It is easier to exercise his duty from beat house.</li> <li>It provides safe and comfortable dwellings.</li> </ul>	9	High
3	Range officer's residence Jharsuguda Belpahar Belpahar Belpahar	<ul style="list-style-type: none"> <li>Used as residence of Belpahar Range Officer</li> <li>2 bedrooms, 1 kitchen, 1 washroom, 1 drawing room, 1 dining room, 2 toilets and boundary wall are available</li> </ul>	<ul style="list-style-type: none"> <li>It provides better facilities for staying and range officer can exercise his duty smoothly.</li> </ul>	9	High
4	Forest Guard Quarter Sambalpur Rengali Gumloi Gumloi	<ul style="list-style-type: none"> <li>Used for training purpose</li> <li>Forest Guard is staying at nearby.</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forest guard to perform his work in the forest area and ensured better supervision.</li> </ul>	6	Medium
5	Range office Sambalpur Rengali Rengali Rengali	<ul style="list-style-type: none"> <li>Used as office of Range officer</li> <li>One range officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies are available.</li> </ul>	<ul style="list-style-type: none"> <li>Official work has been managed smoothly</li> <li>Helped range officer to execute departmental activities</li> </ul>	8	High
6	Staff Barrack Sambalpur Rengali Sardapali Sardapali	<ul style="list-style-type: none"> <li>Used by Para forest staff and other forest squads</li> <li>G+2 floor building</li> <li>Used as temporary staying of Para staff.</li> </ul>	<ul style="list-style-type: none"> <li>It is useful for fast response of the staffs to an emergency</li> <li>Facilitated timely patrolling</li> </ul>	8	High



SL No	Type of Assets/ Division/ Range/Section/ Beat	Observations of the Assets	Impact of the Assets	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
7	Range Office Sambalpur Dhama Dhama Dhama	<ul style="list-style-type: none"> <li>Used as office of Range</li> <li>One range officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies etc are available.</li> </ul>	<ul style="list-style-type: none"> <li>A well organised office helps in proper and smooth functioning of tasks.</li> </ul>	8	High
8	Range Officer's Residence Sambalpur Dhama Dhama Dhama	<ul style="list-style-type: none"> <li>Used by RO for residence purpose</li> <li>Two bed rooms with one kitchen and attached toilet is there.</li> </ul>	<ul style="list-style-type: none"> <li>It provides better stay and smooth operation of his duties.</li> <li>As the building is inside range office boundary, it becomes easier for exercising duties.</li> </ul>	8	High
9	Forest Guard Quarter Sambalpur Dhama Dhama Dhama	<ul style="list-style-type: none"> <li>Used by Forest Guard of Subanpur Beat</li> <li>Well furnished building</li> <li>All facilities like electricity &amp; water are available.</li> </ul>	<ul style="list-style-type: none"> <li>Helped the Forest guard to stay in the forest fringe and provides better supervision &amp; immediate action</li> </ul>	9	High
10	Forester Quarter Sambalpur Dhama Dhama Dhama	<ul style="list-style-type: none"> <li>Used by Forester of Dhama section</li> <li>Well furnished building</li> <li>All facilities like electricity &amp; water are available.</li> </ul>	<ul style="list-style-type: none"> <li>It provides safe dwellings</li> <li>It is easier to exercising of duties.</li> </ul>	9	High
11	Forest Guard Quarter Sambalpur Dhama Larasara Larasara	<ul style="list-style-type: none"> <li>Used as residence</li> <li>Overhead tank, interior finishing like tile flooring have been done</li> </ul>	<ul style="list-style-type: none"> <li>It is convenient to stay for forest guard.</li> <li>It helps in timely operation of forest activities.</li> </ul>	8	High
12	Anti Poaching Shed Sambalpur Dhama Larasara Larasara	<ul style="list-style-type: none"> <li>Used by watcher who is gate in-charge</li> <li>Post Maintenance is required</li> </ul>	<ul style="list-style-type: none"> <li>helped in better supervision for anti poaching squads and taking immediate action for poaching activities.</li> </ul>	8	High
13	Forest Range Office Sambalpur Sadar Sambalpur	<ul style="list-style-type: none"> <li>Used as office of Range</li> <li>One range officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies etc are available.</li> </ul>	<ul style="list-style-type: none"> <li>It becomes easier to manage official works smoothly.</li> <li>It helps to perform official work in an organised way.</li> </ul>	8	High





SL No	Type of Assets/ Division/ Range/Section/ Beat	Observations of the Assets	Impact of the Assets	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
14	Common Toilet Sambalpur Sambalpur Sadar Sambalpur Sadar Sambalpur Sadar	<ul style="list-style-type: none"> <li>For Sanitation purpose</li> <li>Sign board not painted on the wall.</li> </ul>	<ul style="list-style-type: none"> <li>Provided better sanitation to forest staff and visitors.</li> </ul>	7	Medium
15	Forest Guard Quarter Sambalpur Sambalpur Sadar Basiapada Basiapada	<ul style="list-style-type: none"> <li>Used as residence</li> <li>No structural defects are found. Used by forest guard &amp; his family.</li> </ul>	<ul style="list-style-type: none"> <li>It becomes convenient to stay.</li> <li>It enhances work performance.</li> </ul>	9	High
16	Ranger's residence with boundary wall Rairakhol Charmal Charmal Charmal	<ul style="list-style-type: none"> <li>Used by Range officer of Charmal range</li> <li>Rooms available are 2 bedrooms, 1 dinning, 1 drawing, 1 washroom.</li> </ul>	<ul style="list-style-type: none"> <li>Provided better facilities for staying and range officer can exercise his duty smoothly.</li> <li>It is safer to stay with boundary wall around building.</li> </ul>	8	High
17	Barrack Rairakhol Badmal Mochibahal Mochibahal	<ul style="list-style-type: none"> <li>Used by Para forest staff and other forest squads</li> <li>Overall condition is usable.</li> </ul>	<ul style="list-style-type: none"> <li>It is useful for fast response of the staffs to an emergency</li> <li>Facilitated timely patrolling</li> </ul>	8	High
18	Common toilet Rairakhol Badmal Badmal Badmal	<ul style="list-style-type: none"> <li>Two toilets separate for ladies and gents are available</li> </ul>	<ul style="list-style-type: none"> <li>Provided sanitation facilities to forest staff and visitors.</li> </ul>	9	High
19	Range office Rairakhol Naktideul Naktideul Naktideul	<ul style="list-style-type: none"> <li>Used as office of Range</li> <li>One range officer's room, one computer room, one second officer room, two malkhana with attached toilet for gents and ladies etc are available.</li> </ul>	<ul style="list-style-type: none"> <li>It becomes easier to manage official works smoothly.</li> <li>It helps to perform official work in an organised way.</li> </ul>	8	High
20	Forester Quarter Rairakhol Naktideul Batogaon Hitasara	<ul style="list-style-type: none"> <li>Used as residence by forester of Batogaon section</li> <li>Water supply is not there hence depends on neighbourhood water pump for domestic water use.</li> </ul>	<ul style="list-style-type: none"> <li>Now it is convenient to operate with better facility.</li> </ul>		Medium



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21	Forest Guard Quarter Rairakhol Naktideul Jamjuri Chadchadi	<ul style="list-style-type: none"> <li>Used as residence by forest guard of Chadchadi beat</li> <li>Water supply is not there hence depends on neighbourhood water pump for domestic water use.</li> </ul>	<ul style="list-style-type: none"> <li>It is convenient to stay here</li> <li>It helps in timely supervision for ongoing work.</li> </ul>	9	High
22	Malkhana Rairakhol Rairakhol Rairakhol Rairakhol	<ul style="list-style-type: none"> <li>Used to store seized goods.</li> <li>The seized goods present in Malkhana are Wood, Battery, Fire extinguisher, Wood cutter, truck tyre, cycles etc.</li> </ul>	<ul style="list-style-type: none"> <li>It has become easy to store seized goods.</li> <li>Adequate space is available to store goods safely.</li> </ul>	9	High
23	Forester Quarter Rairakhol Rairakhol Luhapank Luhapank	<ul style="list-style-type: none"> <li>Used as residence by forester of Luhapank section</li> <li>Floor is made of tile</li> <li>All interior works are well finished.</li> </ul>	<ul style="list-style-type: none"> <li>Earlier it was difficult to work from distant place</li> <li>Now it provides better facility.</li> </ul>	8	High
24	Forest Guard Quarter Bargarh Ghess Ghess Ghess	<ul style="list-style-type: none"> <li>Used by forest guard of Sardhapali beat</li> <li>Sign board was not painted on the wall.</li> </ul>	<ul style="list-style-type: none"> <li>It provided better accommodation for forest guard.</li> </ul>	9	High
25	Common toilet Bargarh Ghess Ghess Ghess	<ul style="list-style-type: none"> <li>Separate toilets for both male and female are available</li> <li>Sign board was not painted on the wall.</li> </ul>	<ul style="list-style-type: none"> <li>It provided sanitation facilities to forest staff and visitors.</li> </ul>	6	Medium
26	Residence of Range Officer Bargarh Ghess Ghess Ghess	<ul style="list-style-type: none"> <li>Used by RO for residence purpose</li> <li>Rooms available are two bedrooms, one kitchen, one toilet, one drawing room, one dining room, etc.</li> </ul>	<ul style="list-style-type: none"> <li>It provides better facilities for staying and range officer can exercise his duty smoothly.</li> </ul>	8	High
24	Range office Bargarh Paikmal Paikmal Paikmal	<ul style="list-style-type: none"> <li>Used for official purpose of Paikamal range</li> <li>Range office having one RO office, Second office, Hazzat for both Male and Female with attached toilet, Computer room</li> </ul>	<ul style="list-style-type: none"> <li>It was operating in old building which was not convenient where all facilities were not available</li> <li>Now it is convenient to operate day to day work.</li> </ul>	8	High

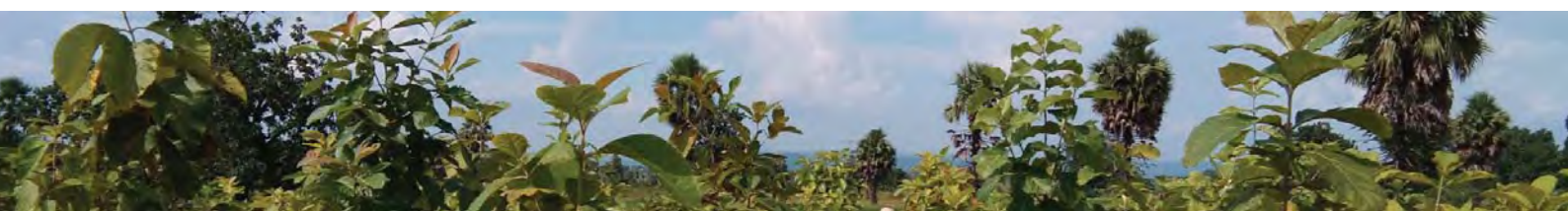


SL No	Type of Assets/ Division/ Range/Section/ Beat	Observations of the Assets	Impact of the Assets	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
28	Residence of Range officer Bargarh Paikmal Paikmal Paikmal	<ul style="list-style-type: none"> <li>Used by RO for residence purpose</li> <li>Two bed rooms with one kitchen and attached toilet is there.</li> </ul>	<ul style="list-style-type: none"> <li>Convenient to stay here compared to previous stay</li> <li>It provides better facilities for staying and range officer can exercise his duty smoothly.</li> </ul>	8	High
29	Forester Quarter cum office Bargarh Paikmal Jharbandh Jharbandh	<ul style="list-style-type: none"> <li>Used by Jharbandh section forester for residence and office purpose</li> <li>CAMPA sign board was not painted on the wall.</li> <li>Water is iron affected and not in drinkable condition</li> </ul>	<ul style="list-style-type: none"> <li>It becomes easier to operate all official work</li> </ul>	6	Medium
30	Range office Bamra WL Khalasuni Khalasuni Khalasuni	<ul style="list-style-type: none"> <li>Used for official purpose</li> <li>One range officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies etc are available.</li> </ul>	<ul style="list-style-type: none"> <li>It becomes easier to manage official works smoothly.</li> <li>It helps to perform official work in an organised way.</li> </ul>	8	High
31	Forester Quarter Bamra WL Khalasuni Khalasuni Khalasuni	<ul style="list-style-type: none"> <li>Used as residence by forester of Khalasuni section</li> <li>Floor is made of tile.</li> <li>All interior works are well finished</li> <li>One bedroom, one kitchen, one drawing room, one bathroom &amp; toilet are available.</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forester to stay and perform his office &amp; supervision work from the forest area in a better manner.</li> </ul>	8	High
32	Common toilet at range office Bamra WL Khalasuni Khalasuni Khalasuni	<ul style="list-style-type: none"> <li>Separate toilets for both male and female are available</li> <li>Sign board was not painted on the wall.</li> </ul>	<ul style="list-style-type: none"> <li>Used by visitors and other staff</li> <li>Water facility is available</li> </ul>	9	High
33	Barrack boundary Bamra WL Khalasuni Khalasuni Khalasuni	<ul style="list-style-type: none"> <li>Surround all building inside range building</li> <li>CAMPA sign board is not there</li> </ul>	<ul style="list-style-type: none"> <li>It becomes safer to stay with surround wall with barbed wire fencing.</li> </ul>	9	High





SL No	Type of Assets/ Division/ Range/Section/ Beat	Observations of the Assets	Impact of the Assets	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
34	Forest Guard Quarter Bamra WL Khalasuni Upermunda Pendrakhol	<ul style="list-style-type: none"> <li>Used as residence by forest guard of Pendrakhol beat</li> <li>Minimum amenities like electricity and water supply are required.</li> </ul>	<ul style="list-style-type: none"> <li>Provided better accommodation for forest guard.</li> </ul>	9	High
35	Forest check gate with watcher shed and Tube well Bamra WL Khalasuni Khalasuni Mandum	<ul style="list-style-type: none"> <li>Used by anti-poaching squad and watcher</li> <li>One bedroom, one dining room, one drawing room, one kitchen and one toilet are available. Solar lighting is available.</li> <li>They are getting water from 100mtr. distance nallah.</li> </ul>	<ul style="list-style-type: none"> <li>It has minimized the poaching cases due to the presence of the watcher in checking point</li> </ul>	7	Medium
36	Malkhana Bamra WL Kuchinda Kuchinda Kuchinda	<ul style="list-style-type: none"> <li>Used to store seized goods.</li> <li>The seized goods present in malkhana are Wood, Battery, Fire extinguisher, Wood cutter, truck tires, cycles etc.</li> </ul>	<ul style="list-style-type: none"> <li>It creates separate space to store seized goods</li> </ul>	6	Medium
37	Forester quarter Bamra WL Jamankira Bhojpur Bhojpur	<ul style="list-style-type: none"> <li>Used as residence by Bhojpur section forester</li> <li>Overhead tank, interior finishing like tile flooring have been done</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forester to stay and perform his office &amp; supervision work from the forest area in a better manner.</li> </ul>	8	High
38	Forest Guard quarter Bamra WL Jamankira Bhojpur Bhojpur	<ul style="list-style-type: none"> <li>Used as residence by Bhojpur beat forest guard</li> <li>Over head tank, interior finishing like tile flooring have been done</li> </ul>	<ul style="list-style-type: none"> <li>Helped the Forest guard to stay in the forest fringe and provides better supervision &amp; immediate action</li> </ul>	8	High
39	Common Toilet Bamra WL Jamankira Bhojpur Bhojpur	<ul style="list-style-type: none"> <li>Two separate toilets used by both male and female</li> <li>Maintenance is required</li> </ul>	<ul style="list-style-type: none"> <li>It resolves the sanitation problem</li> </ul>	8	High
40	Range office Bamra WL Kuchinda Kuchinda Kuchinda	<ul style="list-style-type: none"> <li>Used for official purpose</li> <li>One range officer's room, one computer room, one second officer room, two hazats with attached toilet for gents and ladies etc are available.</li> </ul>	<ul style="list-style-type: none"> <li>The forest work has been managed easily.</li> <li>The direct supervision of the Range officer could be done easily</li> <li>Information sharing became easy within a short period of time.</li> </ul>	8	High



SL No	Type of Assets/ Division/ Range/Section/ Beat	Observations of the Assets	Impact of the Assets	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
41	Staff Barrack and bore well Bamra WL Kuchinda Kuchinda Kuchinda	<ul style="list-style-type: none"> <li>Used by anti poaching squad and watcher</li> <li>G+1 floors are available</li> <li>. In ground floor, two small rooms, one toilet, one garage are available.</li> <li>In 1st floor, 2 balconies, 1 room, 1 toilet, and staircase are available.</li> <li>Bore water supply is provided, hence no water scarcity felt throughout the year.</li> </ul>	<ul style="list-style-type: none"> <li>It provides basic facilities for staying of Para staff and other squads.</li> <li>Facilitated timely patrolling.</li> </ul>	9	High
42	Ranger's Residence Bamra WL Kuchinda Kuchinda Kuchinda	<ul style="list-style-type: none"> <li>Used as residence by kuchinda ranger</li> <li>Two bedrooms, one dinning hall, one drawing hall, one kitchen and attached toilet are available there.</li> </ul>	<ul style="list-style-type: none"> <li>It enabled the Range officer to stay nearer to his own forest area and perform his duty in a better manner.</li> </ul>	8	High
43	Boundary wall Bamra WL Kuchinda Kuchinda Kuchinda	<ul style="list-style-type: none"> <li>Surround range officer's residence to maintain privacy</li> </ul>	<ul style="list-style-type: none"> <li>It provides privacy and safety to the staff and office.</li> </ul>	8	High
44	Forester Quarter Bamra WL Kuchinda Kuchinda Kuchinda	<ul style="list-style-type: none"> <li>Used as residence by Kuchinda section forester</li> <li>Two bedrooms, one dinning hall, one drawing hall, one kitchen and attached toilet are available there. Over head tank is available.</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forester to perform his office &amp; supervision work from the forest area in a better manner.</li> </ul>	8	High
45	Forest Guard Quarter Bamra WL Kuchinda Kusumi Laidaguda	<ul style="list-style-type: none"> <li>Used as residence of laidaguda beat forest guard</li> <li>One bedroom, one dining room, one drawing room, one kitchen and attached toilet are available there.</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forest guard to stay in the forest fringe and provides better supervision &amp; immediate action</li> </ul>	9	High
46	Boundary wall Bamra WL Kuchinda Kusumi Laidaguda	<ul style="list-style-type: none"> <li>Surround forest guard residence to maintain privacy</li> <li>One steel gate is required for safety purpose.</li> </ul>	<ul style="list-style-type: none"> <li>Increase the privacy</li> <li>It protected from entry of wild Animal.</li> </ul>	5	Medium

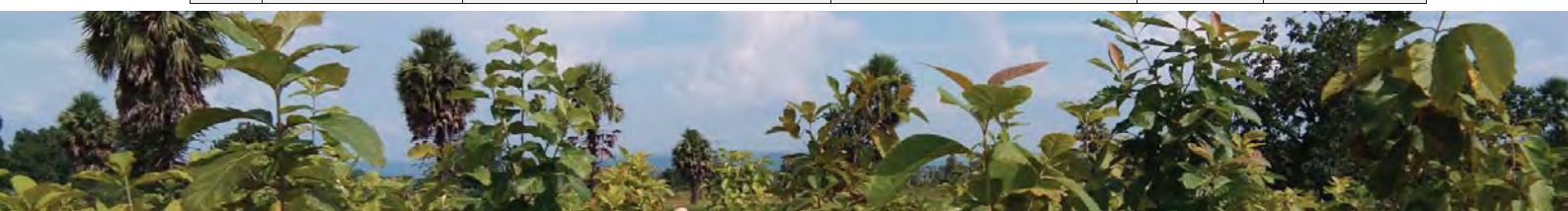


SL No	Type of Assets/ Division/ Range/Section/ Beat	Observations of the Assets	Impact of the Assets	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
47	Forest Guard Quarter Bamra WL Bamra WL Garposh WL Garposh WL	<ul style="list-style-type: none"> <li>Residence purpose</li> <li>Used by forest guard of Garposh WL beat</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard performed his duty staying in core area of the beat</li> <li>It is conveniently stay with all facilities</li> <li>It Increase social regards</li> </ul>	9	High
48	Forester Quarter cum residence Bamra WL Bamra WL Garposh WL Garposh WL	<ul style="list-style-type: none"> <li>Residence purpose</li> <li>Used by forester of Garposh section.</li> </ul>	<ul style="list-style-type: none"> <li>Helped the Forester to stay and perform his office &amp; supervision work from the forest area in a better manner.</li> </ul>	8	High
49	Range office Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used for official purpose of Khalasuni Range</li> <li>Range office is built according to the plan proposed.</li> </ul>	<ul style="list-style-type: none"> <li>The forest work has been managed easily.</li> <li>The direct supervision of the Range officer could be done easily</li> <li>Information sharing became easy within a short period of time</li> </ul>	9	High
50	Construction of boundary enclosure along two sides of gate Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used to separate section of zoo</li> <li>Painting is done to increase durability</li> </ul>	<ul style="list-style-type: none"> <li>It enclosed the zoo from all sides.</li> </ul>	8	High
51	Boundary wall extension Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>For extension</li> <li>Zoo can be divided into sections.</li> </ul>	<ul style="list-style-type: none"> <li>Provided better safety for zoo animals.</li> </ul>	8	High
52	Pump house of two storeyed Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used to supply water to whole zoo</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>It is very useful to meet water demand of zoo</li> </ul>	8	High
53	Post Mortum house Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used for Post mortem of animals</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Post mortem work done easily in side zoo.</li> </ul>	8	High





SL No	Type of Assets/ Division/ Range/Section/ Beat	Observations of the Assets	Impact of the Assets	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
54	Quarantine room Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used to cure injured animals</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>It provides space for rescued animal for short period.</li> </ul>	9	High
55	Forester Quarter Hirakud WL Kamgaon Kamgaon Kamgaon	<ul style="list-style-type: none"> <li>Used by forester</li> <li>Electricity and boundary wall with barbed wire fencing is made.</li> </ul>	<ul style="list-style-type: none"> <li>It helped the Forester to stay and perform his office &amp; supervision work from the forest area in a better manner.</li> </ul>	8	High
56	Forest Guard Quarter Hirakud WL Kamgaon Kamgaon Kamgaon	<ul style="list-style-type: none"> <li>Used by forest guard</li> <li>Electricity and boundary wall with barbed wire fencing is made.</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard performed his duty staying in core area of the beat</li> <li>It is conveniently stay with all facilities.</li> </ul>	8	High
57	Forest Guard Quarter Hirakud WL Kamgaon Kamgaon Lanjipalli	<ul style="list-style-type: none"> <li>Being used</li> <li>One village is inside sanctuary</li> <li>Leopard and bear are coming frequently</li> </ul>	<ul style="list-style-type: none"> <li>Poaching activities were controlled because of one forest guard has been staying regularly.</li> </ul>	7	Medium
58	Forest Guard Quarter Hirakud WL Kamgaon Chaurasimala Mundamoula	<ul style="list-style-type: none"> <li>Used by forest guard</li> <li>Electricity and water facility is not there</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard performed his duty staying in core area of the beat</li> <li>It is conveniently stay with all facilities.</li> </ul>	4	Low
59	Range office Hirakud range Hirakud WL Kamgaon Dhodrukusum Rengali	<ul style="list-style-type: none"> <li>Used for official purpose of Hirakud Range</li> <li>Range office is built according to the plan proposed.</li> </ul>	<ul style="list-style-type: none"> <li>Due to good internet facilities and separate computer room it is easier tracking the fire incidents, elephant movement through GPS remote monitoring.</li> </ul>	8	High
60	Range office Kamgaon range Hirakud WL Kamgaon Dhodrukusum Rengali	<ul style="list-style-type: none"> <li>Used for official purpose of Kamgaon Range</li> <li>Range office is built according to the plan proposed.</li> </ul>	<ul style="list-style-type: none"> <li>It is more convenient to operate office than earlier location.</li> </ul>	8	High
61	Forest Guard Quarter Hirakud WL Kamgaon Dhodrukusum Rengali	<ul style="list-style-type: none"> <li>Used by forest guard</li> <li>Electricity and boundary wall with barbed wire fencing is made.</li> </ul>	<ul style="list-style-type: none"> <li>Earlier the Guard has no quarter while they adjusted in other building, But now it is convenient to stay in operation area.</li> </ul>	8	High

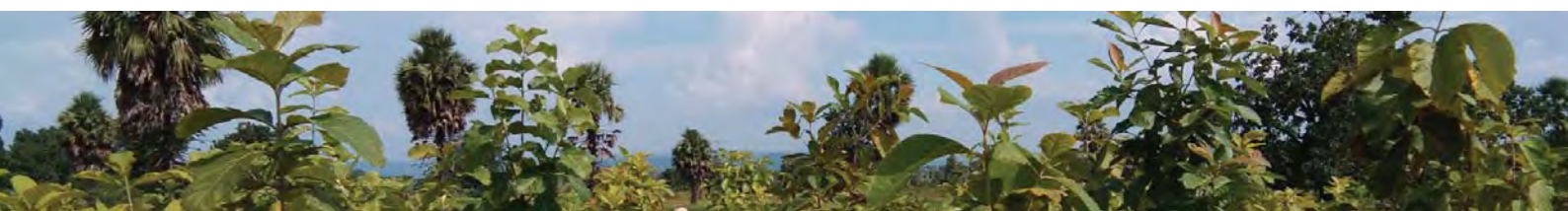


SL No	Type of Assets/ Division/ Range/Section/ Beat	Observations of the Assets	Impact of the Assets	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - High, Medium, Low
62	Residence of forest range officer kamgaon Hirakud WL Kamgaon Dhodrukusum Rengali	<ul style="list-style-type: none"> <li>Used as residence of Kamgaon RO</li> <li>2 bedrooms, 1 kitchen, 1 washroom, 1 drawing room, 1 dining room, 2 toilets and boundary wall are available</li> </ul>	<ul style="list-style-type: none"> <li>Easy to operate than earlier because of adequate space and room.</li> </ul>	8	High
63	Forest Guard Quarter Hirakud WL Kamgaon Dhodrukusum Rengali	<ul style="list-style-type: none"> <li>Used by forest guard</li> <li>Electricity and boundary wall with barbed wire fencing is made.</li> </ul>	<ul style="list-style-type: none"> <li>It provides better super vision</li> <li>It is easier to work smoothly.</li> </ul>	9	High
64	Forest Guard Quarter Hirakud WL Kamgaon Dhodrukusum Rengali	<ul style="list-style-type: none"> <li>Used by forest guard</li> <li>Electricity and boundary wall with barbed wire fencing is made.</li> </ul>	<ul style="list-style-type: none"> <li>It is convenient to operate official work</li> </ul>	9	High
65	Forest Guard Quarter Hirakud WL Kamgaon Dhodrukusum Rengali	<ul style="list-style-type: none"> <li>Used by forest guards of Hirakud range of Rengali beat</li> <li>Electricity and water are there</li> </ul>	<ul style="list-style-type: none"> <li>Forest guard performed his duty staying in core area of the beat</li> <li>It is conveniently stay with all facilities</li> </ul>	9	High
66	Anti poaching shed Hirakud WL Kamgaon Chaurasimala Parvatitang	<ul style="list-style-type: none"> <li>Used by watcher who is gate in-charge</li> <li>Post Maintenance is not done</li> </ul>	<ul style="list-style-type: none"> <li>Helped to provide facilities to stay in operation area and perform their duty smoothly.</li> </ul>	8	High
67	Forest Guard Quarter Hirakud WL Lakhanpur Jhagadabehera Jhagadabehera	<ul style="list-style-type: none"> <li>Used by forest guard</li> <li>Electricity and boundary wall with barbed wire fencing is made.</li> </ul>	<ul style="list-style-type: none"> <li>Performed his duty smoothly than earlier</li> <li>Distance for commuting to work site from office is decreased</li> </ul>	8	High
68	Forest Guard Quarter Hirakud WL Lakhanpur Jhagadabehera Patheidurga	<ul style="list-style-type: none"> <li>Used by forest guard</li> <li>Electricity and boundary wall with barbed wire fencing is made.</li> </ul>	<ul style="list-style-type: none"> <li>Performed his duty smoothly than earlier</li> <li>Distance for commuting to work site from office is decreased</li> </ul>	8	High



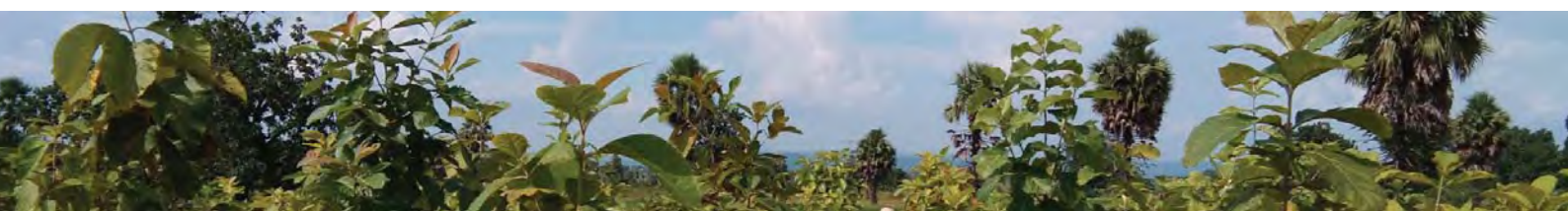
Table 10.18: Usability of Forest Road, Causeway, Calvert:

SL No	Type of Assets ( Division/ /Range/ Section/ Beat	Special Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assesment on the quality of the asset - Good, Medium, Low
1	Culvert Jharsuguda Brajarajnagar Brajarajnagar Amdhara	<ul style="list-style-type: none"> <li>This culvert is present on forest road connecting Amdhara to Badjot.</li> <li>Foundation portion of culvert is not eroded by water flushing, no structural defects are observed</li> </ul>	<ul style="list-style-type: none"> <li>Used to pass water to agricultural field in other side of forest road.</li> </ul>	8	High
2	Causeway Jharsuguda Belpahar Bagmunda Bhaurkhul	<ul style="list-style-type: none"> <li>No structural defect is found in the causeway. Heavy siltation in one side of causeway happened. This causeway is present on 8 km long forest road.</li> <li>All facilities are available</li> </ul>	<ul style="list-style-type: none"> <li>Helps in easy movement during rainy season</li> </ul>	8	High
3	Culvert Sambalpur Rengali Rengali Rengali	<ul style="list-style-type: none"> <li>This culvert is present on forest road</li> <li>Foundation portion of culvert is not eroded by water flushing, no structural defects are observed</li> </ul>	<ul style="list-style-type: none"> <li>Used to bypass water to agricultural field in other side of forest road</li> </ul>	9	High
4	Culvert Sambalpur Rengali Rengali Rengali	<ul style="list-style-type: none"> <li>This culvert is present on forest road.</li> <li>Foundation portion of culvert is not eroded by water flushing, no structural defects are observed</li> </ul>	<ul style="list-style-type: none"> <li>Used to bypass water to agricultural field in other side of forest road</li> </ul>	8	High
5	Causeway Rairakhol Naktideul Jamjuri Chadchadi	<ul style="list-style-type: none"> <li>No structural defect is found in the causeway. Heavy siltation in one side of causeway happened.</li> <li>All facilities are available</li> </ul>	<ul style="list-style-type: none"> <li>Helped in easy movement during rainy season</li> </ul>	8	High
6	Forest Road Rairakhol Naktideul Jamjuri Chadchadi	<ul style="list-style-type: none"> <li>Used as road way to go for Chadchadi village and forest</li> <li>300 families of villages such as Hitasara, Indipur, Angabira and other villages are depending on this road, frequent maintenance is highly required.</li> </ul>	<ul style="list-style-type: none"> <li>Helped to the forest staff and adjacent villagers for their communication.</li> </ul>	8	High





SL No	Type of Assets ( Division/ /Range/ Section/ Beat	Special Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10	Evaluators assessment on the quality of the asset - Good, Medium, Low
7	Culvert Bargarh Paikmal Paikmal Saramsil	<ul style="list-style-type: none"> <li>Chuhapali to Suklipahar forest road</li> <li>Siltation under culvert is very less</li> <li>No structural defect observed.</li> <li>Both side head work is done properly</li> </ul>	<ul style="list-style-type: none"> <li>Mostly Chuhapali villagers accesses to market regularly.</li> </ul>	9	High
8	Causeway Bargarh Paikmal Paikmal Saramsil	<ul style="list-style-type: none"> <li>No structural defect is found in the causeway. Low siltation in one side of causeway found.</li> <li>All facilities are available.</li> </ul>	<ul style="list-style-type: none"> <li>Helps in easy movement during rainy season</li> <li>Mostly useful in patrolling by forest people</li> </ul>	9	High
9	Forest Road Bamra WL Jamankira Bhojpur Sirid	<ul style="list-style-type: none"> <li>Used to connect remote parts of forest</li> <li>Connects Jharpur to Lehmura</li> <li>Forest road is in good condition.</li> </ul>	<ul style="list-style-type: none"> <li>Used as a all weather road. It helped to forest staff to easy communication.</li> </ul>	9	High
10	Causeway Bamra WL Jamankira Bhojpur Sirid	<ul style="list-style-type: none"> <li>No structural defect is found in the causeway.</li> <li>Heavy siltation in one side of causeway happened.</li> <li>All facilities are available</li> </ul>	<ul style="list-style-type: none"> <li>Helped to easy movement during rainy season.</li> </ul>	6	Medium
11	Causeway Bamra WL Jamankira Bhojpur Sirid	<ul style="list-style-type: none"> <li>No structural defect is found in the causeway.</li> <li>Heavy siltation in one side of causeway happened.</li> <li>All facilities are available</li> </ul>	<ul style="list-style-type: none"> <li>Helped in easy movement during rainy season.</li> </ul>	6	Medium
12	Road drain Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Helps to prevent flood like situations inside zoo.</li> <li>Drains are used to drain excess water during rain.</li> </ul>	<ul style="list-style-type: none"> <li>Smoothly drained the rainwater.</li> </ul>		High
13	Culvert Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Siltation under culvert is very less. No structural defect observed.</li> <li>Both side head work is done properly</li> </ul>	<ul style="list-style-type: none"> <li>It helps for forest department officials in proper supervision implementation of forest activities.</li> </ul>	8	High
14	Culvert Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Siltation under culvert is very less</li> <li>No structural defect observed</li> <li>Both side head work is done properly</li> </ul>	<ul style="list-style-type: none"> <li>Patrolling made easy for the Departmental staff.</li> </ul>	9	High



SL No	Type of Assets (Division/Range/Section/Beat)	Special Observations	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Evaluators assessment on the quality of the asset - Good, Medium, Low
15	Causeway Hirakud WL Kamgaon Chaurasimala Parvatitang	<ul style="list-style-type: none"> <li>No structural defect is found in the causeway</li> <li>Heavy siltation in one side of causeway happened.</li> <li>All facilities are available</li> </ul>	<ul style="list-style-type: none"> <li>Helped in easy movement during rainy season</li> </ul>	7	Medium
16	Trail road Hirakud WL Kamgaon Chaurasimala Parvatitang	<ul style="list-style-type: none"> <li>Maintenance is required.</li> <li>3m width of road.</li> <li>Both side brick are put for marking of trail road</li> </ul>	<ul style="list-style-type: none"> <li>Used for walking on sanctuary area.</li> </ul>	9	High
17	Causeway Hirakud WL Lakhanpur Jhagadabehera Jhagadabehera	<ul style="list-style-type: none"> <li>All facilities are available</li> <li>Maintenance is required.</li> <li>No deficient</li> </ul>	<ul style="list-style-type: none"> <li>Helped in easy movement during rainy season.</li> </ul>	7	Medium

Table 10.19: Usability of Sizeryard, Malkhana &amp; other wild life management assets

SL No	Type of Assets (Division/Range/Section/Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
1	Bird bath Jharsuguda Jharsuguda Jharsuguda Jharsuguda	<ul style="list-style-type: none"> <li>Birds usually drink, bathe and cool themselves</li> </ul>	<ul style="list-style-type: none"> <li>Birds around adjacent forest came here frequently for bathing and drinking water.</li> </ul>	8	High
2	Solar fencing Jharsuguda Belpahar Bhikampali Machida	<ul style="list-style-type: none"> <li>To prevent elephant enter into villages</li> <li>Tangamal village is surrounded by solar fencing.</li> <li>VSS are responsible for solar panel fitting when elephant approaches from Lakhanpur range.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced the conflict with wild animals and human beings.</li> </ul>	8	High



SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
3	Elephant Trench Sambalpur Rengali Pardesipali Sangramala	<ul style="list-style-type: none"> <li>Used as barrier for elephants to enter into nearby habitation area</li> <li>Trench is broken by elephants at some point making a way to cross the trench. That needs to be repaired. Human elephant conflicts reported before the construction of trench which is now reduced considerably</li> </ul>	<ul style="list-style-type: none"> <li>It has been reduced frequency of elephant entry to the habitation</li> </ul>	8	High
4	Watch Tower Sambalpur Rengali Sardapali Sardapali	<ul style="list-style-type: none"> <li>Used by para forest staff and forest squad to watch surrounding forest from a height</li> <li>Well maintained.</li> <li>Water, electricity, two rest rooms, kitchen, toilet facilities are available</li> </ul>	<ul style="list-style-type: none"> <li>It is tracking the wild life movement side by side controlling the poaching activities in forest area</li> </ul>	9	High
5	VHF tower Sambalpur Rengali Sardapali Sardapali	<ul style="list-style-type: none"> <li>Used for long distance communication where other communication network is not available.</li> <li>Walkie talkie are given to forester and forest guard to operate from station.</li> </ul>	<ul style="list-style-type: none"> <li>Walkie talkie, modem, battery connection is available and working properly.</li> </ul>	8	High
6	Seizure Yard Sambalpur Dhama Dhama Dhama	<ul style="list-style-type: none"> <li>Used to store seized vehicles and logs.</li> <li>Boundary wall with barbed wire fencing and seizure yard gate are in good condition.</li> </ul>	<ul style="list-style-type: none"> <li>Solar light electrification, Watcher shed are available</li> </ul>	8	High
7	Anti-Poaching Check Gate Sambalpur Dhama Larasara Larasara	<ul style="list-style-type: none"> <li>Used to enter forest area</li> <li>Both side walls are there so that vehicle cant enter side way</li> </ul>	<ul style="list-style-type: none"> <li>Control poaching activities</li> </ul>	8	High
8	Elephant Trench Rairakhol Badbahal Badbahal Podabalanda	<ul style="list-style-type: none"> <li>To prevent elephant movement towards nearby villages</li> <li>Nearby villages protected from elephant intrusion are podabalanda, Barbang, Dhamgad, Purunagad, Badmal etc</li> </ul>	<ul style="list-style-type: none"> <li>It has protected the crop field from destroy by elephant every year</li> </ul>	9	High





SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
9	Watch tower Rairakhol Badmal Badmal Badmal	<ul style="list-style-type: none"> <li>Used by forest protection and anti- poaching sward</li> <li>Incidence like main gate of watchtower, windows of ground floor are broken by elephant cost them too much to replace.</li> <li>G+2 floors available. In ground floor 1 kitchen, 1 toilet, 2 rest rooms are available</li> </ul>	<ul style="list-style-type: none"> <li>Watch the elephant movement and control the poaching activities</li> </ul>	8	High
10	Salt Lick Rairakhol Badmal Badmal Badmal	<ul style="list-style-type: none"> <li>spotted deer used to come here frequently</li> <li>To attract wild animal, 200 no of jackfruits are planted around that place and two water body are also made.</li> </ul>	<ul style="list-style-type: none"> <li>Salt lick helped in mineral supplements to animals.</li> </ul>	8	High
11	VHF tower Rairakhol Naktideul Naktideul Naktideul	<ul style="list-style-type: none"> <li>Used for long distance communication where other communication network is not available.</li> <li>Range of this VHF is 8km to 10km according to user.</li> </ul>	<ul style="list-style-type: none"> <li>Walkie talkie, modem, battery connection is available and working properly.</li> </ul>	8	High
12	Seizure Yard Rairakhol Rairakhol Rampur Rampur	<ul style="list-style-type: none"> <li>Used to store seized vehicles and logs.</li> <li>Boudary wall with barbed wire fencing and seizure yard gate are in good condition.</li> <li>Solar light electrification, Watcher shed are available</li> </ul>	<ul style="list-style-type: none"> <li>Safety storage item in yard</li> </ul>	8	High
13	Malkhana Rairakhol Rairakhol Rairakhol Rairakhol	<ul style="list-style-type: none"> <li>Used to store seized goods.</li> <li>Skylight are made for passage of sunlight during day time. Malkhana gate provided</li> <li>The seized goods present in malkhana are Wood, Battery, Fire exting usher, Wood cutter, truck tyres, cycles etc.</li> </ul>	<ul style="list-style-type: none"> <li>All seized item kept in safe condition within building</li> </ul>	8	High



SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
14	Watch tower Rairakhol Rairakhol Burda Burda	<ul style="list-style-type: none"> <li>Used by para forest staff and forest squad to watch surrounding forest from a high altitude</li> <li>Locals have occupied some area inside watch tower periphery for village meeting properly</li> <li>Water, electricity, two rest rooms, kitchen, toilet facilities are available</li> </ul>	<ul style="list-style-type: none"> <li>Poaching cases are minimised after construction of the watch tower.</li> </ul>	8	High
15	Elephant Trench Rairakhol Rairakhol Rairakhol Rairakhol	<ul style="list-style-type: none"> <li>To prevent elephant movement towards nearby villages</li> </ul>	<ul style="list-style-type: none"> <li>Entry of elephant to the habitation area restricted checked.</li> <li>Reduced the risk of human animal conflict.</li> </ul>	9	High
16	Elephant Trench Rairakhol Rairakhol Rairakhol Rairakhol	<ul style="list-style-type: none"> <li>To prevent elephant movement towards nearby villages</li> <li>Side slope of trench is eroded and hence maintenance is required so that sufficient depth of trench can be maintained.</li> </ul>	<ul style="list-style-type: none"> <li>Entry of elephant to the habitation area restricted checked.</li> <li>Reduced the risk of human animal conflict.</li> </ul>	8	High
17	Seizure Yard Bargarh Ghess Ghess Ghess	<ul style="list-style-type: none"> <li>To store seized vehicles, scraps and wood logs etc.</li> <li>One watcher shed is available inside seizure yard</li> <li>Fencing with barbed wire is available</li> </ul>	<ul style="list-style-type: none"> <li>Seized items are kept in safe condition</li> </ul>	8	High
18	Fire Line Bargarh Paikmal Paikmal Saramsil	<ul style="list-style-type: none"> <li>Taper to Saramsil</li> <li>3 meter width and 10km length fire line created in 2016-17 to prevent spreading forest fire.</li> </ul>	<ul style="list-style-type: none"> <li>Helped reducing the fire incidents basically in summer season.</li> </ul>	8	High
19	Salt Lick Bamra WL Khalasuni Khalasuni Pendrakhol	<ul style="list-style-type: none"> <li>To fulfil mineral deficiency of herbivores animals, they used to come here to consume mineral salt.</li> <li>two and half quintal of crystal salt, 220 kg of black salt and 14 kg of mineral forte are mixed with untrained soil type for the formation of salt lick</li> </ul>	<ul style="list-style-type: none"> <li>Helped to supplement minerals to animals.</li> </ul>	8	High



SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
20	Malkhana Bamra WL Kuchinda Kuchinda Kuchinda	<ul style="list-style-type: none"> <li>Used to store seized goods.</li> <li>The seized goods present in malkhana are Wood, Battery, Fire extinguisher, Wood cutter, truck tyres, cycles etc.</li> </ul>	<ul style="list-style-type: none"> <li>Seized items are kept in safe condition</li> </ul>	8	High
21	Seizure yard Bamra WL Jamankira Bhojpur Bhojpur	<ul style="list-style-type: none"> <li>Used as temporary nursery</li> <li>Barbed wire fencing is done. But after construction of camp shed this can be used for seizure yard purpose</li> </ul>	<ul style="list-style-type: none"> <li>Seized items are kept in safe condition.</li> </ul>	6	Medium
22	VHF tower Bamra WL Kuchinda Kuchinda Kuchinda	<ul style="list-style-type: none"> <li>Used for long distance communication where other communication network is not available.</li> <li>Walkie talkie are given to forester and forest guard to operate from station.</li> </ul>	<ul style="list-style-type: none"> <li>Helped to forest staff for good communication among them.</li> </ul>	8	High
23	Stand up barrier Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Enclose Spotted deer in the zoo.</li> <li>Not a sign of rusting during observation</li> </ul>	<ul style="list-style-type: none"> <li>Barrier is made of iron mesh</li> </ul>	8	High
24	Extension of height of enclosure Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Enclose Spotted deer in the zoo</li> <li>Animal not to escape by jumping through it</li> </ul>	<ul style="list-style-type: none"> <li>These extra piece of iron mesh is attached above stand up barrier</li> </ul>	8	High
25	Concrete seal along wire mesh Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>To support wire mesh</li> <li>It provides support to barrier.</li> </ul>	<ul style="list-style-type: none"> <li>Concrete support the wire to hold it tightly and straight</li> </ul>	7	Medium
26	Solar light (10 sets) Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used for lighting during night</li> <li>Less useful during fog weather</li> </ul>	<ul style="list-style-type: none"> <li>All lights are having solar panels working properly to safety movement in night in century area</li> </ul>	8	High

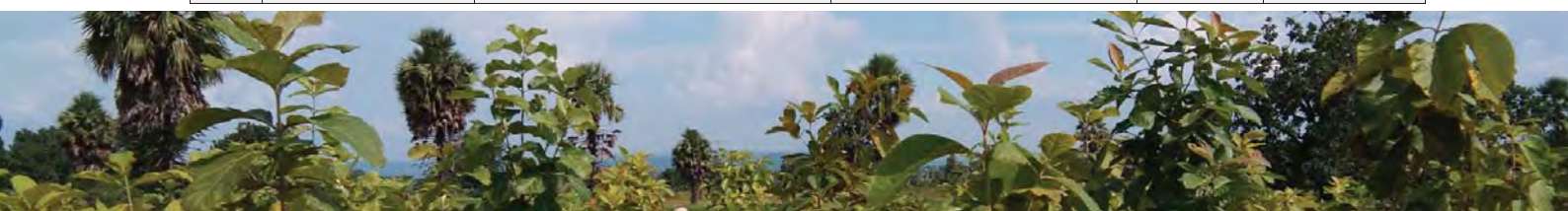




SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
27	Salt Lick Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used for pathway &amp; beautification</li> <li>Easy to walk in zoo</li> </ul>	<ul style="list-style-type: none"> <li>Meant for the salt deficiency of wild animal</li> </ul>	8	High
28	Stand up barrier Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used to held animals</li> <li>It helps visitors to watch animals from a distant.</li> </ul>	<ul style="list-style-type: none"> <li>Should be strong</li> </ul>	8	High
29	Circular enclosure Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>For Python</li> <li>It helps to keep animals and birds sealed in complete with wire</li> </ul>	<ul style="list-style-type: none"> <li>Should have enough space</li> </ul>	8	High
30	Circular enclosure Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>For Mongoose and giant square</li> <li>It helps to keep animals and birds sealed in complete with wire</li> </ul>	<ul style="list-style-type: none"> <li>Should have enough space</li> </ul>	8	High
31	Circular enclosure Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>For evict cat</li> <li>It helps to keep animals and birds sealed in complete with wire</li> </ul>	<ul style="list-style-type: none"> <li>Should have enough space</li> </ul>	8	High
32	Circular enclosure Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>For evict cat</li> <li>It helps to keep animals and birds sealed in complete with wire</li> </ul>	<ul style="list-style-type: none"> <li>Should have enough space</li> </ul>	8	High
33	Steel railing in-front of aquarium and 2nd gate Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>To make a line for visitors</li> <li>Looks good and maintain rows</li> </ul>	<ul style="list-style-type: none"> <li>Made of steel and access to aquarium</li> </ul>	8	High
34	Steel wire enclosure for bird Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>To keep birds inside</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Meets its requirement</li> </ul>	8	High
35	2nd gate for leopard Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used to keep leopards</li> <li>It helps visitors to watch animals from a distant.</li> </ul>	<ul style="list-style-type: none"> <li>Should be strong</li> </ul>	8	High



SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
36	Construction of roof of drinking water facility Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Roof helps to keep water tanks over head</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Roofs are well maintained</li> </ul>	8	High
37	Animal health care center Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used for immunization</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>One veterinary room, one treatment hall and one transporting cage is available</li> </ul>	8	High
38	Partition enclosure between sambar & wild boar Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used to keep animals separate</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Used as divider for different animals</li> </ul>	8	High
39	Construction of shed for sambar Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>For animal resting purpose</li> <li>Quite useful during summer</li> </ul>	<ul style="list-style-type: none"> <li>It is well maintained</li> </ul>	9	High
40	Construction of water tank Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used to supply water to whole zoo</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Meets peak demand of water</li> </ul>	10	High
41	CCTV of 10 nos. Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>For security purpose</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Working properly</li> </ul>	10	High
42	CCTV of 6 nos. Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>For security purpose</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Working properly</li> </ul>	10	High
43	Construction of chairs for children park Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Helps to sit</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Made of concrete &amp; colourful, attractive</li> </ul>	10	High



SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or = 3, Medium > 3 to 7, High > 7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
44	Construction of fountain Hirakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>For beautification</li> <li>Fountain is operational</li> </ul>	<ul style="list-style-type: none"> <li>For beautification</li> </ul>	8	High
45	Elephant Trench Hirakud WL Kamgaon Dhodrukusum Rengali	<ul style="list-style-type: none"> <li>To prevent elephant movement towards nearby villages</li> <li>It covers two beats from Rengali to Pahadsikra beat</li> </ul>	<ul style="list-style-type: none"> <li>Rice fields present in opposite site of field are protected through trench</li> </ul>	10	High
46	Watch tower Hirakud WL Kamgaon Ghodukusum Rujenmal	<ul style="list-style-type: none"> <li>Used by forest protection and anti-poaching squad</li> <li>Used to watch distant forest activities</li> </ul>	<ul style="list-style-type: none"> <li>Well maintained</li> </ul>	10	High
47	Salt Lick Hirakud WL Kamgaon Dhodrukusum Dhodrukusum	<ul style="list-style-type: none"> <li>Spotted deer used to come here frequently</li> </ul>	<ul style="list-style-type: none"> <li>Salt lick helps in mineral supplements to animals</li> <li>The soil used to make it is well drained soil. Refilling of salt lick is done quarterly.</li> </ul>	9	High
48	Salt Lick Hirakud WL Kamgaon Dhodrukusum Dhodrukusum	<ul style="list-style-type: none"> <li>Spotted deer used to come here frequently</li> </ul>	<ul style="list-style-type: none"> <li>Salt lick helps in mineral supplements to animals</li> <li>The soil used to make it is well drained soil. Refilling of salt lick is done quarterly.</li> </ul>	8	High
49	Solar fencing Hirakud WL Kamgaon Chaurasimala Parvatitang	<ul style="list-style-type: none"> <li>Used where electricity is not accessible</li> <li>Cloudy weather reduce its efficiency</li> </ul>	<ul style="list-style-type: none"> <li>Working properly</li> </ul>	9	High
50	Watch tower Hirakud WL Kamgaon Chaurasimala Parvatitang	<ul style="list-style-type: none"> <li>Used by forest protection and anti-poaching squad</li> <li>Used to watch distant forest activities</li> </ul>	<ul style="list-style-type: none"> <li>Well maintained</li> </ul>	9	High
51	Elephant Trench Hirakud WL Kamgaon Chaurasimala Chaurasimala	<ul style="list-style-type: none"> <li>To prevent elephant movement towards nearby villages</li> </ul>	<ul style="list-style-type: none"> <li>Rice fields present in opposite site of field are protected through trench</li> </ul>	9	High





SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
52	Meadow development Hirakud WL Lakhanpur Jhagadabehera Jhagadabehera	<ul style="list-style-type: none"> <li>It attracts multiple wild life.</li> <li>Manuring can be done.</li> </ul>	<ul style="list-style-type: none"> <li>It is yet to be full grown. During rainy season it may grow faster.</li> </ul>	8	High
53	Meadow development Hirakud WL Lakhanpur Jhagadabehera Jhagadabehera	<ul style="list-style-type: none"> <li>It attracts multiple wild life.</li> <li>Manuring can be done.</li> </ul>	<ul style="list-style-type: none"> <li>It is yet to be full grown. During rainy season it may grow faster.</li> </ul>	8	High
54	Solar fencing Hirakud WL Lakhanpur Jhagadabehera Patheidurga	<ul style="list-style-type: none"> <li>To prevent elephant from entering into villages</li> <li>Extension of fencing can be done covering nearby other villages.</li> </ul>	<ul style="list-style-type: none"> <li>Working properly</li> </ul>	8	High

Table 10 20: Usability of water body:

SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
1	Water Body Jharsuguda Brajarajnagar Rajpur Rajpur	<ul style="list-style-type: none"> <li>Used for both wild animal and domestic purpose</li> <li>Maintenance is not happened</li> <li>This water body is coming under Rajpur PRF and nearest village is Amdhara. Wild pig, barking deer, rabbit, peacock etc are usually coming here. Soil quality is stony.</li> <li>Bank slope is there, water depth upto 4 ft is available</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	6	Medium
2	Water Body Jharsuguda Jharsuguda Jharsuguda Jharsuguda	<ul style="list-style-type: none"> <li>Used for both wild animals and domestic purpose</li> <li>none</li> <li>Wildlife from nearby forest came here.</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	8	High



SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
3	Water Body Jharsuguda Belpahar Bhikampali Deopali	<ul style="list-style-type: none"> <li>For wild animal drinking purpose only</li> <li>No deficient</li> <li>Animals like Leopard, Peacock, Wild boar, barking deer are coming frequently. Water is available throughout the year.</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	8	High
4	Water Body Sambalpur Rengali Bhalubahal Pardesipali	<ul style="list-style-type: none"> <li>Wild animal drinking purpose and habitat of reptiles like Ajghar</li> <li>Outlet for water body is not found</li> <li>Water is available throughout year. During the time of visit depth of available water is approximate 1m.</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	8	High
5	Water Body Sambalpur Sambalpur Sadar Basiapada Basiapada	<ul style="list-style-type: none"> <li>Wild life drinking purpose</li> <li>None</li> <li>Water available throughout year</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	8	High
6	Water Body Rairakhol Badmal Mochibahal Mochibahal	<ul style="list-style-type: none"> <li>Both for wildlife drinking and domestic use purpose</li> <li>No deficient</li> <li>Fruit bearing plant species are Jamun, Guava, Mango etc. Non-fruit bearing plants like Accacia, Bamboo etc are also planted. One outlet is made to flush out extra water from water body during rainy season. Water is available throughout the year.</li> </ul>	<ul style="list-style-type: none"> <li>Maximum depth of water available is 5 ft, two rows of fruit bearing plantation has been done around water body, Wild animal such as elephant, spotted deer usually come</li> </ul>	8	High
7	Water Body Rairakhol Badmal Mochibahal Saiberni	<ul style="list-style-type: none"> <li>Used by wild animals like elephant, wild boar, barking deer and peacock</li> <li>No deficient</li> <li>During evaluation depth of water was 5 ft approx and water is available throughout year. Casualty of two persons happened by elephant attack near water body last year.</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	8	High



SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
8	Water Body Bargarh Ghess Diptipur Jhamkar	<ul style="list-style-type: none"> <li>Used by wild animal for drinking purpose only</li> <li>Water level is low during summer. Water out let is required</li> <li>Fruit bearing Plantation were done on the embankment of the waterbody like Amla, Jamun, Mango, Bela, Banyan, Pipal, Kaju, Chilly etc. Leopard, Elephant, Sambar, Barking Deer, Wild Boar etc are benefited. Water level is very low during summer.</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	8	High
9	Water Body Bargarh Paikmal Paikmal Saramsil	<ul style="list-style-type: none"> <li>Used by wild animals as well as local villagers of Lergah village.</li> <li>Water is not available during summer season</li> <li>Baison, Deer, Sambar, Wild Boar are frequently coming.</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	7	Medium
10	Water Body Bamra WL Kuchinda Badbahal Rengali	<ul style="list-style-type: none"> <li>No deficient</li> <li>All types of wild animals like wild boar, barking deer, elephant etc comes regularly to this water body. Diversion outlet is available to escape excess water during rainy days. Sign board is available. Fruit bearing trees like neem, maya, bara, jamun, amla, mango etc are planted for fodder purpose. Water is available throughout the years. Soil type is stoney hence dredging is difficult.</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	8	High
11	Check dam Hirakud WL Kamgaon Kamgaon Kamgaon	<ul style="list-style-type: none"> <li>Used to stop high current water</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	8	High
12	Water harvesting structure Hirakud WL Kamgaon Kamgaon Kamgaon	<ul style="list-style-type: none"> <li>Retains high water from going into agriculture field</li> <li>None</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Stone patch is given on both sides</li> </ul>	8	High

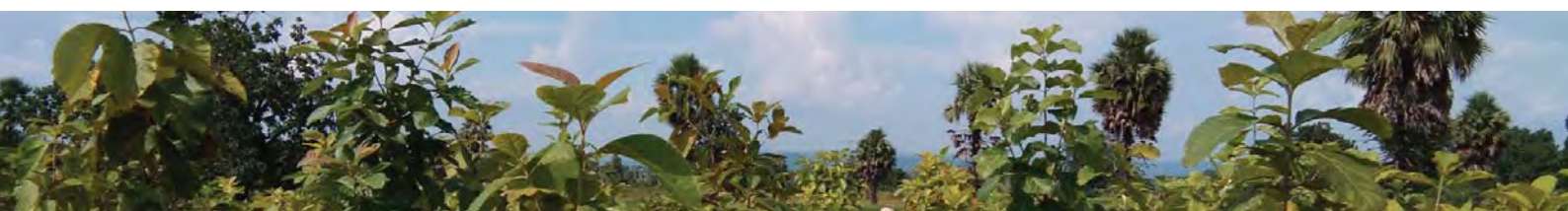




SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
13	Water body Hirakud WL Kamgaon Dhodrukusum Dhodrukusum	<ul style="list-style-type: none"> <li>Inlet and outlet, bank slope should be available</li> <li>Good</li> <li>More dredging and maintenance is required.</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	8	High
14	Water Body Hirakud WL Kamgaon Chaurasimala Mundamari	<ul style="list-style-type: none"> <li>Mango, Jamun, sugar apple and Guava plantation has been there</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	8	High
15	Water Body Hirakud WL Lakhanpur Jhagadabehera Patheidurga	<ul style="list-style-type: none"> <li>Inlet and outlet, bank slope should be available</li> <li>Good</li> <li>More dredging and maintenance is required.</li> </ul>	<ul style="list-style-type: none"> <li>Water availability throughout the year for drinking and bathing purpose for wild animals.</li> </ul>	8	High

Table 10.21: Usability of Soil Moisture Conservation work (SMC)

SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
1	SMC Rairakhol Badmal Badmal Badmal	<ul style="list-style-type: none"> <li>Percolation pit of size 1m length, 1m breadth and 1m depth has been done to help moisture conservation</li> <li>Siltation happened upto 80% during last 10 years</li> </ul>	<ul style="list-style-type: none"> <li>Due to water conservation in the root zone, natural growth of plants happened. Because of illicit felling of planted trees such as Teak, the growth of plants are not good</li> </ul>	8	High
2	Earthen bund Bargarh Paikmal Paikmal Saramsil	<ul style="list-style-type: none"> <li>To check soil erosion , to maintain moisture content of soil</li> <li>All facilities are available.</li> <li>As soil quality at this site is loose, earthen bund helps to store ground water very well.</li> </ul>	<ul style="list-style-type: none"> <li>Recharge of the ground water</li> <li>Supplements the forest density</li> </ul>	9	High



SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low,> or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
3	LBS Bargarh Paikmal Paikmal Saramsil	<ul style="list-style-type: none"> <li>To check soil erosion , to maintain moisture content of soil</li> <li>As soil quality at this site is loose, LBS helps to check siltation very well.</li> </ul>	<ul style="list-style-type: none"> <li>It helps to maintain moisture content of soil.</li> </ul>	8	High
4	SMC- Graded Bund Bamra WL Khalasuni Khalasuni Manduum	<ul style="list-style-type: none"> <li>Check the velocity of the run-off</li> <li>It helps to carry excessive rainfall safely downstream and to let off stream flow in natural channels.</li> <li>Bunding increases the time of concentration of rainwater where it fall thereby allowing rainwater to percolate into the soil.</li> </ul>	<ul style="list-style-type: none"> <li>Control of the soil erosion</li> </ul>	8	High
5	LBCD Bamra WL Khalasuni Khalasuni Manduum	<ul style="list-style-type: none"> <li>Check the velocity of the run-off</li> <li>Bunding increases the time of concentration of rainwater where it fall thereby allowing rainwater to percolate into the soil.</li> </ul>	<ul style="list-style-type: none"> <li>It helps to carry excessive rainfall safely downstream and to let off stream flow in natural channels</li> </ul>	8	High



Table 10.22: Usability of Nursery:

SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
1	Mega Nursery Jharsuguda Brajarajnagar Rajpur Chandrimal	<ul style="list-style-type: none"> <li>It is used to grow and propagate different plant species</li> <li>All facilities are available.</li> <li>Sapling like neem, kanchana, karanja, sita phal, white siris, bela, patuli, lemon, pomogranate, Debadaru, baula, jamun, sissoo, bahada, kala sirisa, arjun, phanphani, amla, sal, pahadi sissoo etc are available there.</li> <li>As there is limit for saplings available to public such as 10 saplings for each adhaar card holder, hence one can't buy in mass number.</li> </ul>	<ul style="list-style-type: none"> <li>It helps to create the quality source of saplings</li> <li>Provide quality planting material to same department</li> </ul>	8	High
2	Upgraded Nursery Rairakhol Naktideul Naktideul Naktideul	<ul style="list-style-type: none"> <li>One lakh seedlings are grown every year in this nursery.</li> <li>Water supply and electricity is available, Approach road for nursery for easy transit is available.</li> <li>Various work done under CAMPA to upgrade nursery such as construction of office building, Labour shed, Watchman shed, Seed Godown, Seed Treatment tank, Compound wall, Concrete road, Branch road, Main gate, Pump kouse, Over head tank, Site clearance and levelling, Electricity, Ponds, Irrigation facility, Drying Yard, Mixing yard, Vermi compost pit-1 &amp; 2, Nursery equipment, Water tanker, Agro net shed, Store house, Seedling yard, Power sprayer, Compost Godown etc.</li> </ul>	<ul style="list-style-type: none"> <li>Production of one lakh nursery per annum</li> </ul>	9	High

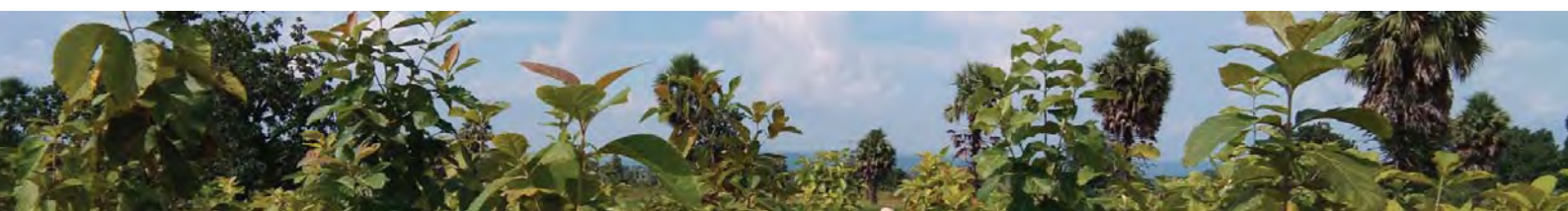




Table 10.23: Usability of drinking water facilities:

SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
1	Tube Well at Deogaon RF Sambalpur Dhama Deogaon Deogaon	<ul style="list-style-type: none"> <li>Used to provide water facility to be used in forest guard quarter</li> <li>Tube well is properly working</li> <li>As water was not available during summer, deep bore well is required.</li> </ul>	<ul style="list-style-type: none"> <li>Meant for the water scare city in forest guard quarter</li> </ul>	8	High
2	Tube well at Hitch Nursery Sambalpur Dhama Larasara Larasara	<ul style="list-style-type: none"> <li>Used to provide water facility to be used in forest guard quarter of Laidaguda</li> <li>Tube well is properly working</li> <li>350m deep bore well is required. As water was not available during summer.</li> </ul>	<ul style="list-style-type: none"> <li>It is supplementing the water supply to nursery</li> </ul>	8	High
3	Tube Well Rairakhol Badmal Mochibahal Mochibahal	<ul style="list-style-type: none"> <li>Not functioning</li> <li>Deep borewell is required</li> </ul>	<ul style="list-style-type: none"> <li>Not so effective</li> </ul>	1	Low
4	Tube well Bamra WL Kuchinda Kusumi Laidaguda	<ul style="list-style-type: none"> <li>Used to provide water facility to be used in forest guard quarter of laidaguda</li> <li>Tube well is properly working</li> <li>350m deep borewell is required. As water was not available during summer.</li> </ul>	<ul style="list-style-type: none"> <li>Meets the water scarcity in forest guard quarter</li> </ul>	8	High
5	Over head tank over circular enclosure Hirkud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>To provide water</li> <li>3 nos. Of tank having capacity of 1000 L</li> </ul>	<ul style="list-style-type: none"> <li>Its water is used for animals bathing and drinking purpose</li> </ul>	9	High
6	Construction of water tank Hirkud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used to supply water to whole zoo</li> <li>Meets high time demand of water</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Regular water supply to Zoo animals which was not possible earlier and create major problem in summer</li> </ul>	9	High



SL. No	Type of Assets (Division/ Range/ Section/ Beat)	Observations	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Low
7	Water tank for duck and swan Hiraakud WL Sambalpur Sambalpur Sambalpur	<ul style="list-style-type: none"> <li>Used as small pond</li> <li>Made of plastic and durable</li> <li>Well maintained</li> </ul>	<ul style="list-style-type: none"> <li>Better movement for duck and swan in zoo area</li> </ul>	8	High

### Case Study: Livelihood Diversification through CAMPA Supported AJY and VSSs at Oram Niktimal Village under Kuchinda Block of Sambalpur District in Odisha

The rural communities of India, particularly the tribe depend upon forest products for meeting their needs. They have been playing a crucial role in nature conservation since time immemorial. Instances of community led conservation practices in India as well as in Odisha include maintenance of sacred groves, ponds and wetlands.

Communities living in the Oram Niktimal are traditionally dependent on forests for firewood, fodder, timber, kendu leaves, sal leaves and other valuable Non-Timber Forest Produce (NTFPs). The degree of dependence varies according to the socio-economic condition of the households and is higher among the poor and the landless. For the poor, the forests provide an important source of income – through the collection of kendu patta,

sal leaves, sal seeds, jhuna, mahua flowers, mahua seeds, mushrooms, amla, harda, bahada, chara, kendu, siali leaves, mango fruits, and tooth sticks.

Niktimal is a small Village/hamlet in Bamra Tehsil of the Sambalpur District of Odisha. It is located 82 km towards north from the District head quarter of Sambalpur, 6 km from Bamra and 283 km from state capital Bhubaneswar. About sixty households comprising of about 250 people reside in this village. In 1988, under the new forest policy that recognized village as a unit of forest management, the Forest Department formed Village Forest Protection Committees (VFPC) in some of the forest fringe villages including Oram Niktimal. In another forest policy enacted in 1993, new changes were incorporated to convert all the VFPCs into Van Samrakshan Samitis (VSS). The formation of VSS has improved the community linkages with the Forest Department. Later, the Odisha government decided to implement 'Ama Jangal Yojana' (AJY) in a big way. The AJY scheme focuses on forest restoration, promotion of





sustainable management of forest by strengthening participatory forest management and improvement of livelihood of forest dependent communities. The scheme will be implemented over a period of eight years in three phases and cover 5000 VSS. They formed the VSSs in the year 2015-16 with the help of the Forest Department of Kuchinda range. Before 2015-16, villagers of Oram Nikitimal faced scarcity of fuel wood and other NTFPs due to damage of forest. After losing their bread and butter from the nearest forest, villagers felt very harassed. They started village forest conservation initiatives in the 2015-16 through formation of a VSS named Oram Nikitimal VSS and the villagers are dedicatedly involved in VSS activities.

In this connection the people of Oram Nikitimal decided to join with AJY scheme of Government of Odisha. They formed a VSS in the year 2016 named “Vana Sarakhana Samiti – Orm Nikitimal”. After that, they stood to protect the existing forest near their village. This initiative helped to regenerate the degraded forest and growth of timber species in a sustainable manner. With the help of the Forest Department they started reforestation work and protected near about 89.9 hectare forest areas. Two and half years later it converted into a dense forest. In last three years the Forest Department did not find any human animal conflict, forest fire incidents or theft of timber wood. It benefited the community through the enrichment of NTFP and other useful forest products. It also provided additional income source to the target VSS and its members. They sell different NTFP products such as Mushroom @ Rs100 per kg, Ruguda Chatu/Rutuka @Rs60 to 70 per tola, Mahula @Rs30 per kg, Sargi (Sal seed) @ Rs15 per kg., Chara @Rs70 to 80 per kg, Kendu patra @Rs100 per 100 grams. VSS of Orm Nikitimal VSS received first prize as the best Vana Surakhya Samiti of Odisha in the year 2017-18. At the time of Vana Mahosthav, Mr. Naveen Patnaik, the Chief Minister of Odisha felicitated with a trophy and One Lakh rupees to Oram Nikitimal Vana Sarakhya Samiti.

**Mushroom Cultivation:** Oram Nikitimal villagers have been doing mushroom cultivation also through formation of a Self-Help Group (SHG) named Utkal Janani. Integrated Tribal Development Agency (ITDA) has been supporting the SHG by giving training on mushroom cultivation. And also a NGO namely Sambalpur Integrated Development Institute (SIDI) is reported to have been associated with the SHGs for their capacity improvement. The villagers cultivate straw mushroom with capacity of 40 beds and sell it at Kuchinda market. After meeting all costs each SHG member earns upto Rs.5000 to Rs.6000 per month. Approximately in one cycle, they collect mushroom two times per month.



**Stitching of Khali and Dana:** Some SHG members of Utkal Janani independently prepare Khali & Dana. From this they earn Rs 600 weekly. Selling price of khali in nearest market is about Rs 40 per 100 pieces of Khali and same is for dana. In the year 2016-17, SHG members of Utkal Janani attended the Adibasi Mela for selling their SHG and NTFP products i.e. Khali, Dana, Jhadu, Jhuna, Dhupakathi, Badi, Muga, Biri etc.





## 10.17 Summary of Key Findings

- The study covered all the five forest divisions of the circle under different components of CAMPA. The forest divisions covered are (1) Bamra WL, (2) Bargarh forest division, (3) Jharsuguda Forest Division, (4) Rairakhol forest division and (5) Sambalpur forest division. Under the forest divisions, 16 ranges were covered under the study.
- Among the plantations, 41.57 percent sites are ANR with gap, 5.62 percent are bamboo plantation, 43.82 percent are block plantation, 6.67 percent are CA-PCA and remaining 2.25 percent are corridor & fodder plantation sites.
- Among the silviculture operations, 8.57 percent are ANR without gap, 11.43 percent are ANR without gap in AJY, 5.71 percent are management of old teak sites, 65.71 percent are SSO-bamboo and 8.57 percent are SSO-timber.
- Plantation in the circle covers a total area of 22268 ha. in the last 5 years, i.e., on an average 2783.5 ha. per year, irrespective of type of plantation.
- Key plantation activities that have been taken up are ANR with enrichment planting, block plantation, CA PCA and Bamboo plantation.
- Under silvicultural operations, activities taken up are like SSO-Timber, SSO-Bamboo, ANR without Gap and maintenance of old Teak plants.
- The average plantation area of the studied sites observed to be 130.69 ha. with total plantation area of 11,631.48 ha. Of the total plantation area, 55.8 percent are ANR with gap plantation, followed by block plantation (29.7 percent) and bamboo plantation. CA-PCA and corridor-fodder plantation has been less, i.e., 1.3 percent and 0.3 percent of the total plantation.
- Overall, mortality rate is calculated to be 9.3 percent. Highest plant mortality is reported in Rairakhol forest division (19.18 percent) and lowest in Sambalpur forest division (3.71 percent). The Jharsuguda forest division is having the second highest plant mortality rate with 8.84 percent.
- Jharsuguda is having the lowest plant per ha. (1439/ha.) in block plantation followed by Bamra WL (1459/ha.).
- In block plantation the plant survival rate varies from 92.71 percent (Rairakhol) to 98.46 percent (Sambalpur).
- ANR with gap plantation (enrichment planting) is taken in a dual mode, i.e., dense plantation in block mode in identified patch of land and/or sparse / scattered plantation in the forest area.
- In ANR with gap plantation the plant mortality rate varies between 1.54 percent (Sambalpur) to 7.29 percent (Rairakhol).
- As well as plant survival rate per ha. varies between 89.6 percent (Jharsuguda) to 97.1 percent (Rairakhol). Accordingly, plant mortality rate varies between 2.9 percent (Rairakhol) to 10.4 percent (Jharsuguda).
- Compensatory afforestation observed in Bargarh, Jharsuguda and Rairakhol forest divisions of Sambalpur circle. Plants per ha. enumerated to be 1575 in Rairakhol, 1533 in Jharsuguda and 1510 plants per ha. in Bargarh. Plant survival rate is highest in Rairakhol (98.44 percent) and lowest in Bargarh (94.38 percent).
- It is observed in the assessment that the canopy cover varies by plantation types and year of plantation.
- Pillars have been installed in different plantation sites, across the forest divisions in the circle.
- Different SMC activities taken up in plantation sites are staggered trench, half-moon trench, LBCD and



percolation pits. In sites under silvicultural operation, emphasis is given to half-moon trench, stone packing and staggered trench construction.

- The mean maximum height of the plants, irrespective of the year of plantation and plant species, calculated to be 3.7 mt. and 16.1 mt. in case of plants covered under silvicultural operations.
- The mean minimum height of the plants at the circle level found to be 1.9 mt. for the plantation sites and 13.5 mt. for the sites covered under silvicultural operations.
- Similarly, In case of plantation, mean maximum GBH/GCH has been 16.9 cm and mean minimum GBH/GCH has been 8.6 cm. Mean maximum and mean minimum GBH/GCH of plants under silvicultural operations found to be 138.1 cm and 114.6 cm respectively.
- Plant protection measures taken are like fencing, fire protection measures, watch and ward etc. In certain cases, villages and VSS have been found taking care of the local forest area and plantation sites.
- Different records / documents are maintained at the range office level with respect to plantation activities, such as plantation journal, plantation site map, treatment map and other registers.
- In Sambalpur Circle there are some regeneration species are found i.e. Mai, Chara, Sal, Achu, Kendu, Sunari, Bahada, Rohini, Sidha, Cashew, Harida, Jamun, Karada, Simil, Mai, Mahula, Sidha, Ghurudu, Kasi, Sunari, Neem, Dhaura, Pahadi sissoo, Kekat, Kurei and Khaira.
- With respect to infrastructure development there are different types of buildings i.e. Range Office, Ranger's Residence, Forester office-cum-residence, Beat House, Staff Barrack, Anti poaching shed, Check gate shed etc. are constructed under CAMPFA funds. As well as some other assets like forest road, causeway, culvert, saltlick, water bodies, boundary wall, VHF tower, elephant trench, tube well, nursery, seizure yard, meadow development and sacred groves are also construed under CAMPFA fund in the Sambalpur Circle.

### 10.18 Suggestions

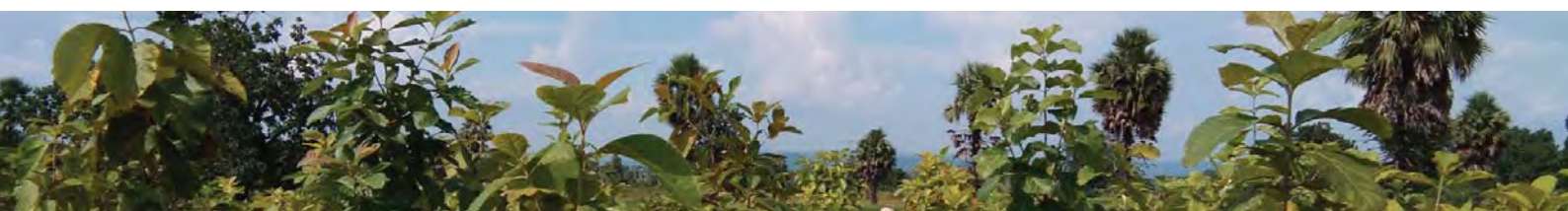
- Watch & ward should be extended to 10 years instead of 4 years.
- Indigenous and diversified species for plantation under ANR should be adopted to replicate like a natural forest.
- During physical evaluation, it was observed that chances of illicit felling are higher in plantation sites nearer to human habitation due to consumption of fuel wood and other forest products. Accordingly, more emphasis should be given for watch & ward.
- In those lands where soil quality is not conducive for a particular species of plant, manure can be applied during initial years of plantation.
- In dense forest sites only protection in terms of watch & ward is not sufficient for proliferation of natural forest. Additional SMC works can be done to protect from soil erosion and moisture conservation.
- Fire protection measures such as fire line creation, training of fire squad & upgradation of equipment should be done. For effectiveness maintenance of fire lines should be done on routine basis.
- In sloppy terrain areas where siltation percentage is high, renovation of SMC works should be done.
- Unwanted species needs to be uprooted for better growth of plantation.
- Good coppice tree species should be planted, so that in case of fire incidence or illicit tree cutting, new shoots come up and within few years lost biodiversity can be restored.
- Due to climate change, some areas are facing erratic rainfall and dry spells. Hence plant species which are adaptive to such scenarios should be planted instead of regular one.



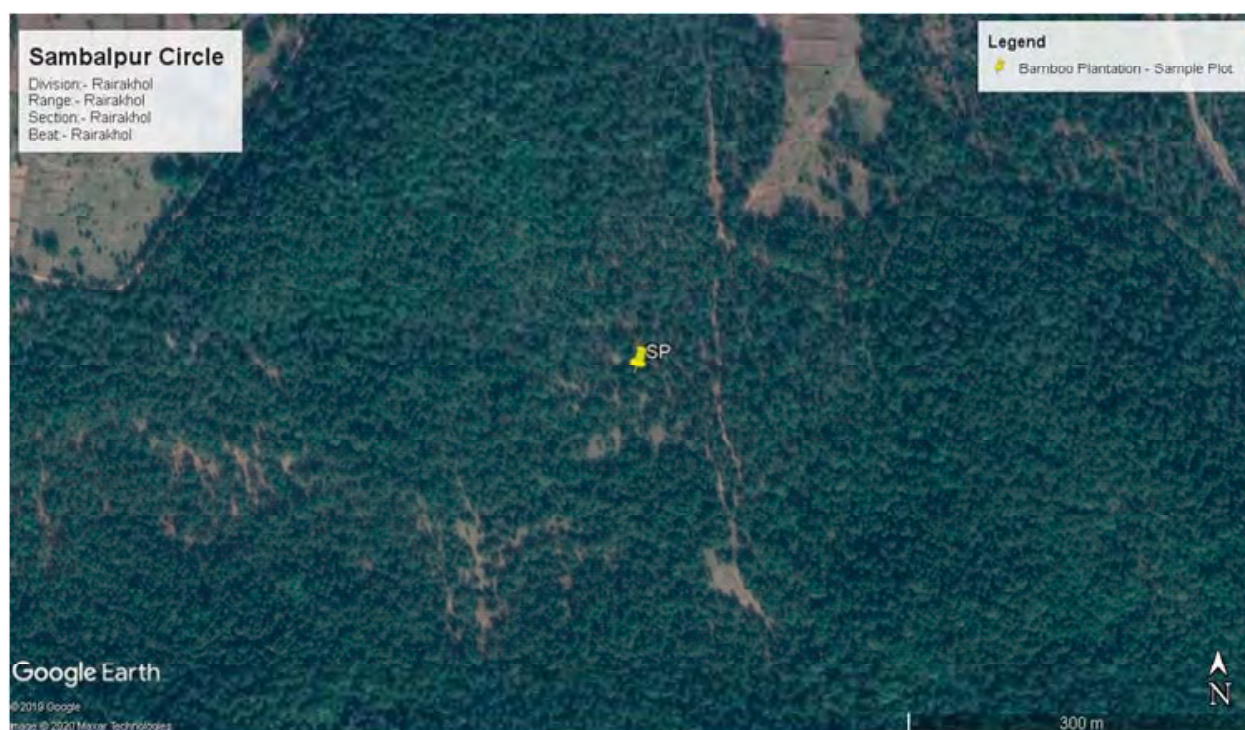


- In elephant prone areas, fruit bearing corridor plantation can be done to prevent human elephant conflict. However, fruit bearing plants like mango, jack fruit etc required pruning and summer season maintenance.
- Inside treatment area of ANR where plantation activities are not done, some measures like fire protection, SMC creation and general watch & ward should be done to preserve the existing forest.
- In bamboo plantation, saplings picked for plantation should be minimum one year so that it can survive in natural forest.
- Silviculture evaluation should be done within one year of operation. So that output of silviculture operation can be accessed correctly.
- Maintenance work like pruning, thinning, climber cutting and removal of unwanted species should be done periodically at all plantation sites.
- Solar fencing is not working at some place. Hence immediate repairing of solar fencing should be done.
- VHF and wireless station are not operative at majority of sample ranges visited and those should be restored properly.
- Boundary wall and Tube well should be provided in residence of Ranger, Forester and Forest guard.
- Due to water stagnation at roof, durability of building reduces. Hence staircase should be provided in buildings to access roof.
- Maintenance of every building should be done on annual basis so that those becomes usable and durable.

### 10.18 Satellite Imagery of Sample plots







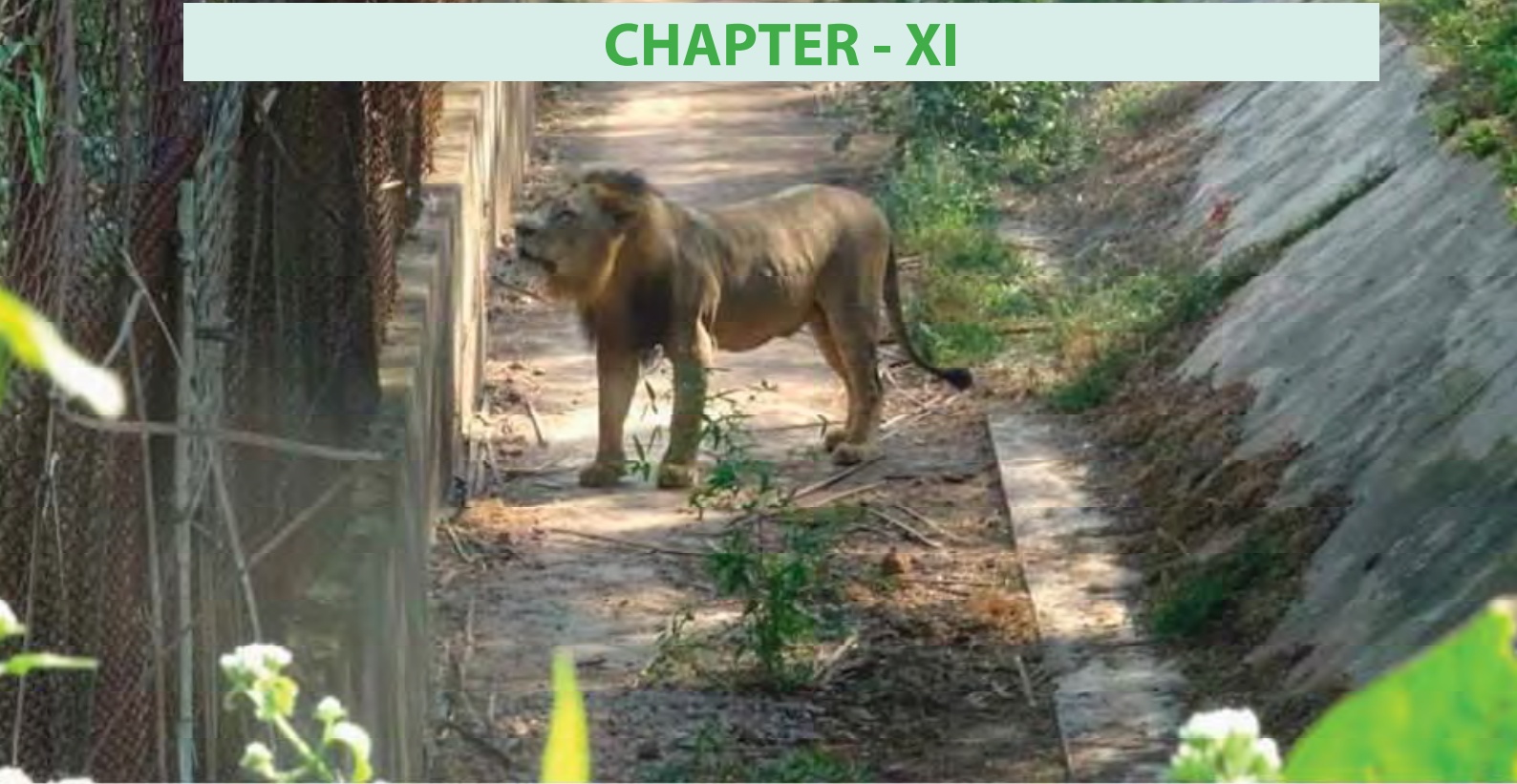








## CHAPTER - XI







## 11. Evidence of CAMPA implementation in Nandankanan Biological Park

Nandankanan Biological park comprises of Nandankanan Zoo, State Botanical Garden and two wetlands namely Kanjia lake (66 Hectares) and Kiakani lake (25 Hectares). Nandankanan Biological park was created as Nandankanan zoological park in Odisha on 29th December 1960 as the first zoological park of the state. The total area of the biological park is about 437 hectares. Administratively the Biological park is divided under seven ranges and each range is headed by a range officer. The seven ranges are – Animal, Revenue, Security, Project, SBG-I, SBG-II, Sanctuary and Store. Over years it has spearheaded many significant improvements to provide highest standards of housing, husbandry and health care to the captive wild animals. Nandankanan zoo houses 157 species of amphibians, reptiles, birds and mammals. The natural forest areas of Nandankanan is home to a rich assemblage of free-living wild animals including 13 species of mammals, 15 species of reptiles, 179 species of birds, 20 species of amphibians, 96 species of butterflies and 51 species of spiders. Besides there are 750 species of plants are also documented in the sanctuary. The state Botanical garden adjoining located to Nandankanan zoo is also a part of Nandankanan Biological Park. The two important wetlands – Kanjia lake (66 Hectares) and Kiakani lake (25 Hectares) are the important wetlands found inside the biological park.

### 11.1 CAMPA Funds

During the period 2009-10 to 2016-17, a total of Rs.1045.25 lakh has been sanctioned under CAMPA for development of Nandankanan biological park. Out of the sanctioned amount a sum total of Rs.910.96 lakh which is 87.2 percent of the sanctioned amount is spent for different activities. The unspent money of each APO is utilized in the subsequent years. Upto the year 2014-15, CAMPA activities were not streamlined. However, after 2014-15, CAMPA activities are more focussed and attempts are made to utilize about 90 percent of the sanctioned amount. As it can be seen from the following table, about 99.2 percent of the sanctioned amount is utilized in the year 2013-14 and about 90.8 percent in the year 2016-17.

*Table 11.1: Amount sanctioned and Expenditure under CAMPA (2009-10 to 2016-17)*

Sl.	Years	Amount Sanctioned under CAMPA (Rs. In Lakh)	Expenditure (Rs. In Lakh)	% Achievement
1	2009-10	-	-	-
2	2010-11	94.38	73.38	77.7
3	2011-12	52	52	100.0
4	2012-13	68.76	38.86	56.5
5	2013-14	63.28	63.24	99.9
6	2014-15	60	31.44	52.4
7	2015-16	119.75	118.78	99.2
8	2016-17	587.08	533.26	90.8
	Total	1045.25	910.96	87.2

*Source- Compiled from Annual Reports, Nandakan Biological Park.*

<sup>21</sup> Nandankanan Biological Park. Annual Report, 2018-19



## 11.2 Activities Undertaken

- Utilizing CAMPA funds following activities were taken up during the 2009-10 to 2016-17.
- ROs for drinking water provision of the tourists
- Baby Feeding Centre for the benefits of tourists
- Roads inside the Biological Park
- De-siltation of Kanjia Lake
- Nandankanan Peripheral Boundary lines
- Hospital equipment purchase
- Wage Payments to DEOs/ Protection squads
- Vehicle Support for the protection squad

## 12.3 Usability and Impacts of the Assets created under CAMPA

SL. No	Type of Assets	Observation	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Poor
1	Appointment of DEOs	<ul style="list-style-type: none"> <li>• Four DEOs have been deployed through service provider under CAMPA .</li> <li>• The salary of DEOs are paid from CAMPA annual funds.</li> <li>• They are paid salary on 1st week of every month after deduction of ESI &amp; EPF .</li> </ul>	<ul style="list-style-type: none"> <li>• Facilitated effective implementation of multiple activities with ensured team spirit.</li> </ul>	10	High
2	De -weeding of Kanjia lake	<ul style="list-style-type: none"> <li>• Boating facilities for visitors are created and thereby revenue of the zoo increases.</li> <li>• D e - w e e d i n g activities have led to multiple ecosystem services like- supply of oxygen to aquatic fauna, scenic beauty of the lake, preventing de-siltation, better and clean water to zoo animals and boat ride facility to the tourists.</li> </ul>	<ul style="list-style-type: none"> <li>• Attracted more number of visitors for boating and recreation.</li> <li>• Improved the scenic beauty of the lake with enriched biodiversity and different type of fishes moving across the water.</li> </ul>	9	High





SL. No	Type of Assets	Observation	Impact	Score (Low, > or=3, Medium >3 to 7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Poor
3	CC Road, FRH to Heritage Garden	<ul style="list-style-type: none"> <li>The old road is upgraded and becomes wide.</li> <li>Widening of the road is viewed convenient for movement of vehicles.</li> <li>Better accesses to picnic pindi in botanical garden.</li> </ul>	<ul style="list-style-type: none"> <li>Constructed all-weather road made convenient to access the picnic Pindi which was previously submerged during rainy season.</li> <li>View of Kanjia Lake attract visitors. Thus number of visitor increased for site seen.</li> </ul>	9	High
4	Bore well	<ul style="list-style-type: none"> <li>850-meters supply pipe used in for water outlet provides dedicated water supply to Zoo animals.</li> <li>Water is available for 24 hours.</li> </ul>	<ul style="list-style-type: none"> <li>Drinking water to visitors as well as zoo animals made available</li> </ul>	10	High
5	Baby care Centre one	<ul style="list-style-type: none"> <li>One lactating mother who can easily breast feed her baby with all facilities like long seating cemented bench, one wash basin which can maintain the privacy during practice.</li> <li>One lady attendant is posted during visiting hours of the zoo to provide required service to baby as well as mother if needed.</li> </ul>	<ul style="list-style-type: none"> <li>Before establishment of the Centre, the visitors (Lactating mother) faced abnormal situation by sitting under the tree or any isolated place.</li> <li>During walking within the zoo sometimes mothers also do take rest.</li> <li>Creation of such facility inside the zoo has provided an international look to the zoo.</li> <li>Improved security and safety for lactating mothers in feeding and taking care of babies.</li> </ul>	10	High
6	Motor vehicle Garaze	<ul style="list-style-type: none"> <li>Mostly staff vehicles are parked.</li> <li>At least 3 to 4 vehicles can be kept in this Garage.</li> </ul>	<ul style="list-style-type: none"> <li>Availability of parking place for staff vehicles.</li> </ul>	9	High



SL. No	Type of Assets	Observation	Impact	Score (Low, > or=3, Medium >3 to7, High >7 to 10)	Evaluators assessment on the quality of the asset - High, Medium, Poor
7	Zoo Laboratory	<ul style="list-style-type: none"> <li>From the The forensic laboratory previously stood inside the was upgraded as Zoo laboratory by utilizing CAMPA funds.</li> </ul>	<ul style="list-style-type: none"> <li>Helped immensely in testing of samples, their culture and observations. Previously all such sample tests were being conducted in OUAT, Bhubaneswar. Thus leading to savings of time also.</li> </ul>	9	High
8	Back scroll of Himalaya Bear	<ul style="list-style-type: none"> <li>It is an isolated cage where old animals (bears) are kept for rest and distracting from visitor's observation.</li> </ul>	<ul style="list-style-type: none"> <li>The distrubance of old bears by visitors minimised and surgical operation and treatment of infected bears made easy.</li> </ul>	9	High
9	Boundary wall	<ul style="list-style-type: none"> <li>Replaced boundary wall in north side of the zoo on the way of Baranga-Chandaka highway</li> <li>It has constructed after damage of a portion of the old boundary wall.</li> <li>Columns are constructed including pillar and bricks are filling in between the Columns.</li> </ul>	<ul style="list-style-type: none"> <li>Helped in preventing entry of outside visitors and elephants from Chandaka forest to the Zoo.</li> </ul>	10	High
10	Visitors rest shed	<ul style="list-style-type: none"> <li>Newly constructed and adequate space to take rest by visitors.</li> </ul>	<ul style="list-style-type: none"> <li>As the area of the zoo is vast, the visitor has to take rest. Under the intervention rest shed for visitors made available at the mid point of the zoo.</li> </ul>	9	High
11	RO mineral water plant	<ul style="list-style-type: none"> <li>It has been set up for tourists to get purified drinking water.</li> <li>Any time pure drinking water available.</li> </ul>	<ul style="list-style-type: none"> <li>Availability of quality safe drinking for visitors in the campus itself.</li> </ul>	10	High



## 11.4 Suggestions

- It is suggested by the zoo officials that E Green Watch passwords are not given to Nandankanan Biological Park, although it is given to territorial divisions. Because of this, time to time updating of information on E Green Watch is not possible. Taking note of it, zoo officials may be given, E Green Watch passwords.
- With respect to management of CAMPFA funds, permissible and non-permissible works should be defined taking into account “Management of Funds in Wild life Sanctuary”.
- Type of activities to be undertaken under CAMPFA should be defined and specified. It is also indicated by the zoo officials that even after approval of works as per APOs, there should be provision of sanction order for each of the specified works individually.
- With respect to zoo hospital upgradation, there is no specific clarity in CAMPFA guidelines. It needs to

### Case Study: Strengthening of Ecosystem Services of Kanjia Lake with CAMPFA Funds

Kanjia lake is a part of the Nandankanan Zoological Park and is at the middle of Nandankanan and separates Botanical park from Zoological park. Carving a scenic landscape, this lake with its abundant fish population is recognized as a ‘Wetland of National Prominence’ by the Government of India. The main lake covers 75 hectares (190 acres), the total wetland covers an area of 105 hectares (260 acres).



It has a rich biodiversity and is a wetland of national importance. The lake’s ecosystem consists of 37 species of birds, 20 species of reptiles, 10 species of amphibians, 46 species of fish and three species of prawns, 10 species of sub-merged macrophytes, 14 species of floating macrophytes and 24 species of emergent macrophytes. Wetlands elsewhere are regarded as the most productive ecosystems comparable to rain forests and coral reefs and are often said as “the kidneys of the landscapes”. Wetlands contribute immensely to the hydrological and chemical cycles and are considered as “Biological Supermarkets”.

Kanjia lake has been facing a major problem of weed invasion. It requires de-weeding every year which is very much a costly affair. Due to CAMPFA funds, the zoo authorities have been able to undertake de-weeding activities more frequently. The activities have led to multiple ecosystem services like- supply of oxygen to aquatic fauna, scenic beauty of the lake, preventing de-siltation, better and clean water to zoo animals and boat ride facility to the tourists.





be specified in CAMPA Guidelines.







## CHAPTER - XII







## 12. Way Forward

### 12.1 Plantation

- Indigenous species should be planted instead of exotics. Species selected for planting should be done in accordance with local forest types and species composition in the forests of respective agro climatic zone and physiography. Polyculture mode of plantation may be practised in all sites so that the plantation develops to different canopy layers.
- Species should be selected on the basis of soil condition of the plantation site. Climate resilient drought hardy species, good coppice need to be identified for planting in degraded open forests.
- Advance year wise planning for plantation programme would help in developing quality planting materials and site treatment, pitting, manuring etc. in advance, to ensure growth and higher survival rate. In those lands where soil quality is not conducive for growth of plant, FYM can be applied during initial years of plantation.
- Ideally 2-year seedling could be used to prevent casualty due to browsing and wind damage. Towards quality planting materials, efforts may be directed for germinating it by best quality seeds from indigenous mother trees.
- Maintenance and watch and ward activity could continue for 6 to 8 years for sustainability of plantations. Allotment of plantations to VSS for upkeep and maintenance in exchange of a consolidated amount per year as an incentive can be tried.
- Brush wood fencing is required for the plantation in site which is nearer to the habitation, unless successful community participation is ensured.
- Number of watchers could be in proportion to the size of the plantation site. It is ideal to place one watcher for each 10 hectares of plantation.
- As far as feasible, contiguous areas should be taken up for consecutive planting in successive year to close canopy in open forests and for ease of maintenance and protection.
- After damage of installed sign boards and pillars, there should be reinstallation of the same for proper demarcation and identity of the plantation site.
- Post planting operations should be taken up in a time bound manner, as it is observed that delayed release of fund seriously affect post planting work and has a tell-tale effect on the condition and growth of planted seedlings.
- A combination of planting models with specific objectives should guide species selection and planting design. Only mixture of species should not be the criteria of planting design. Criteria like fuelwood production, NTFP production, Fruit plants corridor, Bamboo breaks, Medicinal trees grove etc. could be various models adopted in selected sites every year.
- Encroached forest lands, lands earlier affected by podu should be given priority in afforestation works so that the area is salvaged permanently.
- Fruit bearing tree species may be planted along with other species as it will promote interest of the locals for protection and will also provide some livelihood to them.
- Root trainer seedling technology is viewed to have mixed result. It's efficacy however needs proper evaluation.
- In cyclone prone areas, species identified to withstand strong wind and cyclone need to be planted.
- Horticultural species can be promoted in rural areas outside forests under entry point programme to provide livelihood along with green cover.



- Timely fund release is viewed by staffs to be helpful in executing the plantation activities in the APO execution year.

## 12.2 Silvicultural Operation and SMC

- The man-days allotted for SSO Bamboo work is not enough, so number of man-days may be increased. Planting of 2-3 yrs old bamboo seedlings has a better chance of survival and growth. Seedlings developed through layering and cutting technique has been adopted in many states to raise successful bamboo plantations.
- More focus may be given to Silviculture Operation work other than plantation owing to better growth of trees due to silvicultural operations.
- There should be periodic termite treatment measures against termite attack to Teak trees in various plantation sites.
- Regular maintenance work on SMC structures would improve the efficiency and durability of the water and soil conservation system
- Subsidiary silvicultural work like climber cutting and thinning in high forest, forests with high canopy and density can be a regular activity which was the practice in past, but discontinued since long.
- Limited pruning and thinning seems to have been done in old plantations including Teak. During CAMPA period though only Teak plantation pruning was taken up, mixed plantations were excluded. Congested mixed plantations beyond 10 yrs need thinning which will also produce fuelwood and timber for local people.
- Brush wood fencing to forest areas with low regeneration and high seed producing areas can improve seed germination, and seed collection of superior trees.
- Each water body should have inlet and outlet water flow system which can recharge and discharge the excesses water in rainy season
- Budget provision for Thinning, Pruning & Cleaning in 3 to 4 years interval may be made for all plantation sites which is viewed more effective in better growth of trees and improving site quality.
- Awareness generation programmes at community level for protecting forest from fire, illegal cutting of trees may be undertaken under CAMPA funds. Regular radio and TV programmes in creating awareness may be an effective way in this regard.
- Bamboo SSO works should be taken up in a continued manner so as to cover a particular forest block in 2-3 year time, instead of operating in a scattered way in different forest blocks. Rotational closure of forests to grazing would be helpful in regeneration of severely degraded bamboo areas. The adjoining villages need to be roped in bamboo SSO works in a way that forest closure to grazing can be enforced.
- There is constant need to augment the water harvesting structure and various SMC work particularly in degraded sites, and hilly terrains in many districts.
- Fire protection measures such as fire line creation, training of fire squad & upgradation of equipment should be done. For effectiveness of fire lines maintenance of the same should be done on routine basis.



## 12.3 Training and Capacity building

- There should be periodic capacity improvement programmes for the members of JFMCs under Ama Jangala Yojana.
- Need of training of Forest Staff on proper documentation of Plantation journal, record keeping and reporting is felt.
- There should be well structured training modules and annual training schedule for different categories of regular and contractual staff. The CCF training and Research could be in charge of monitoring implementation and guidance of the overall trainings conducted at field level.
- Resource persons should be pooled from different line department and academic institutions, NGOs. One or two months could be exclusively devoted in all divisions for annual refresher trainings.
- A professional agency can be engaged to assess training need, develop short term training modules and content design in consultation with the department.
- Exposure visit within the state and to outside state for staff of different ranks like guard, forester would help them to learn best practices.

## 12.4 Infrastructure

- A lot of infrastructures have been made under CAMPA fund. Most of the Range offices, Quarters, Section offices, Beat House are made under CAMPA fund. In the case of buildings constructed during initial years of CAMPA now needs to be repaired and maintained.
- With the objective of distinguishing assets created under CAMPA, there could be uniformity in the colour of the buildings in all the forest divisions.
- Permanent electricity and water connection required to be provided to most of the buildings. Fund for renovation of the already existing buildings may be considered for the sustainability of the assets.
- The plan and design of each category of building needs a relook in view of many shortcomings in the structural and functional aspects of the infrastructure. For instances in the existing designs, there is no staircase in residential quarter to access the roof, for maintenance work. Similarly, parapets are not provided in some buildings, whereas in others sewerage tanks are not provided for. At many places staff emphasised need for Boundary wall and Tube well in residence of Ranger, Forester and Forest guard.
- Provision of iron window and door panel could be substituted with wooden or PVC door/window panels in view of extreme heat in western Odisha.
- Maintenance provision of the infrastructural facilities created under CAMPA need to be made either in regular budget or using CAMPA fund.
- At few wildlife sites, causeway and culvert constructed under CAMPA has served the desired purpose in easing connectivity.

## 12.5 Wildlife Management

- Meadow development works should be part of CAMPA APOs in each year. Reason being that if it is done in a particular year and discontinued subsequently, there is dearth of fodder for wild animals. Fodder Plantations should be prioritized in elephant corridors because such type of plantations may restrict elephants to forest area. In the process, human elephant conflict can be minimised.





- Some incentive system over the monthly remuneration for para , anti-poaching staff , elephant trackers, forest squads engaged by the service providers under CAMPA may be considered, to motivate the frontline workers.
- The elephant trackers, antipoaching squad personnel should be selected on the basis of defined criteria. They were to be trained on basic skills of wild life management, first aid etc. Proper dress and equipment provision need to be standardised, as this varies widely from division to divisions.
- Maintenance of solar fencing system should be taken up periodically. In many instances it is observed that once battery is damaged, there is no further provision of maintenance of solar fencing system. Solar fencing has mostly failed owing to entry of local cattle for grazing purpose. Provision of AMC or empanelled vendors for maintenance at circle/division level is essential to keep all units functional.
- Solar lighting of vulnerable villages in the forest fringes can be helpful to prevent village raiding by elephant.
- There has been less focus in maintaining VHF system in the wake of mobile use. However in many interior areas it serves useful purpose. So all dysfunctional units need to be repaired/replaced and updated.
- Antipoaching camps and wildlife surveillance system needs strengthening in term of equipment, regular training and capacity building of frontline staff. Para forest staff, trackers are to be provided proper protective gear and equipment not only for tracking but for their own safety and security as well. Electricity facility/Solar power system especially at barrack/ watcher shed and different quarters should be considered. Most often due to absence of electricity, effective use of the created infrastructure is undermined.
- Permanent tracking stations in the elephant corridor and adjoining habitations regularly visited by elephants would be helpful in round the year monitoring of animal movements.
- Proper selection of sites for waterbody to be done to avoid water tanks in non-essential sites.
- Proper care to be taken in dovetailing of wild life management schemes with CAMPA APO to avoid overlapping of similar works in specified sites.
- Use of drone in monitoring wild animal can be started on experimental basis.
- An information network and WhatsApp group involving all vulnerable villages of a range can provide advance intimation and warning on wildlife movement.
- Fuel supplied for trawlers engaged in sea patrolling at Rajnagar WL division is viewed insufficient. Increased amount of fuel may be provisioned for effective patrolling.
- It is viewed that livelihood promotion in forest range areas frequently encountering man-animal conflict might be helpful to control poaching activities.
- Provision of more number of rescue units and increased mobility to attend injured animal to be given importance in future APO.
- The wild life protection squad patrolling at sea Rajnagar WL division need proper training and sea worthy equipment and protective gear.
- Use of mobile APP for tracking animals and communication to find place in the wildlife management approach. Networking of vulnerable villages through WhatsApp group within a range would help in better surveillance and tracking of wild animals.
- Department may also plan for on line of payment to the affected households for crop damage and damage to property and life caused by wild animals.



- Regular awareness campaign to protect wild life and do's and don'ts for public in vulnerable areas through electronic and print media can be taken up as a round the year activity by wildlife wing.

## 12.6 Amajangala yojana

- It is a flagship programme of GoO which is at the initial stage of implementation. The budgetary allocation is limited. Plantation has been the singular component with little entry point or other conservation activity.
- Community response and involvement widely varies across ranges. To make it a full-scale community programme the scheme needs long term continuity, higher infusion of funds and a project mode of implementation as had been the case with OFSDP
- In view of lack of proper guideline, the programme has been mostly top down. Although micro plans have been developed, villagers' role has been mostly confined to wage labourer. The level of awareness about the programme is relatively low in most places except for few village leaders.
- A positive feeling and interests for partnering with department in conservation and management of forests was noticed in few sites after introduction of AJY. However, in most places community is sceptical about ownership of plantations and its future use.
- At places, where community involvement was sought and was successful from beginning through implementation, villagers appreciate the benefit of the programme. They stated that right from improvement in forest cover to getting wage employment the scheme had contributed to conservation and livelihood in many ways. Some villagers opine the major benefit is the increase in yield of NTFP and fuelwood. Others identify waterbody to be useful both for animal and human and should be replicated in surrounding regions.
- Communities had shown interests in forest protection but would like to be provided monetary compensation which is contrary to the ethos of participatory framework.
- Community also desire higher stake in programme implementation and suggest creation of community assets and capacity building support from department along with planting activities.











## ANNEXURE







## I. Geo Tagging of Sampled out of Plantation activities under Berhampur Circle

Division	Range	Section	Beat	Type of Assets	Area of the site (Ha)	plot number	Latitude / Longitude (Degree Decimal)							
							Latitude 1	Longitude 1	Latitude 2	Longitude 2	Latitude 3	Longitude 3	Latitude 4	Longitude 4
Ghumshar South	Aska	Aska	Khandarabali	Block Plantation	50	1	19.285	84.838	19.704	20.368	19.703	20.368	19.703	84.665
Ghumshar South	Aska	Aska	Khandarabali	Block Plantation	50	2	19.703	84.665	19.702	20.361	19.703	20.368	19.703	84.665
Ghumshar South	Aska	Aska	Khandarabali	Block Plantation	50	3	19.704	84.662	19.704	20.366	19.704	20.366	19.704	84.662
Ghumshar South	Aska	Aska	Babanapur	Bald Hill Plantation	20	1	19.629	84.663	19.662	20.326	19.662	20.325	19.662	84.663
Ghumshar South	Aska	Aska	Babanapur	Bald Hill Plantation	20	2	19.662	84.663	19.662	20.325	19.662	20.325	19.662	84.663
Ghumshar South	Aska	Dharakot	Bahanrapur	ANR with GAP	40	1	19.642	84.553	19.642	20.196	19.642	20.195	19.642	84.554
Ghumshar South	Aska	Dharakot	Bahanrapur	ANR with GAP	40	2	19.641	84.554	19.642	20.196	19.642	20.196	19.642	84.553
Ghumshar South	Soroda	Gajarbadi South	ramnaguda	SSO Bamboo	304	1	19.812	84.250	19.812	20.062	19.829	20.075	19.812	84.250
Ghumshar South	Soroda	Gajarbadi South	ramnaguda	SSO Bamboo	304	2	19.812	84.250	19.811	20.061	19.812	20.061	19.811	84.249
Ghumshar South	Soroda	Gajarbadi South	ramnaguda	SSO Bamboo	304	3	19.811	84.249	19.811	20.060	19.811	20.061	19.811	84.249
Ghumshar South	Soroda	Gajarbadi South	ramnaguda	SSO Bamboo	304	4	19.812	84.249	19.812	20.061	19.812	20.060	19.812	84.248
Ghumshar South	Soroda	Gajarbadi South	ramnaguda	SSO Bamboo	304	5	19.811	84.249	19.811	20.059	19.811	20.059	19.811	84.248
Ghumshar South	Badagada	Sidhapur	S Gunduribadi	CA ANR with Gap plantation	50	1	19.738	84.459	19.738	20.188	19.738	20.188	19.737	84.450
Ghumshar South	Badagada	Sidhapur	S Gunduribadi	CA ANR with Gap plantation	50	2	19.738	84.451	19.738	20.189	19.736	20.193	19.736	84.457



Division	Range	Section	Beat	Type of Assets	Area of the site (Ha)	plot number	Latitude / Longitude (Degree Decimal)							
							Latitude 1	Longitude 1	Latitude 2	Longitude 2	Latitude 3	Longitude 3	Latitude 4	Longitude 4
Ghumshar South	Badagada	Sidhapur	S Gunduribadi	CA ANR with Gap plantation	50	3	19.737	84.453	19.737	20.190	19.737	20.190	19.737	84.453
Ghumshar South	Badagada	Sidhapur	S Gunduribadi	ANR with GAP	100	4	19.698	84.458	19.698	20.157	19.698	20.156	19.698	84.458
Ghumshar South	Badagada	Sidhapur	S Gunduribadi	ANR with GAP	100	5	19.702	84.458	19.702	20.160	19.702	20.160	19.702	84.458
Ghumshar South	Badagada	Sarabadi	S Gunduribadi	ANR with GAP	100	1	19.698	84.457	19.698	20.155	19.698	20.155	19.697	84.462
Ghumshar South	Badagada	Sarabadi	S Gunduribadi	ANR with GAP	100	2	19.699	84.458	19.699	20.157	19.699	20.157	19.699	84.458
Ghumshar South	Badagada	Sarabadi	S Gunduribadi	ANR with GAP	100	3	19.699	84.456	19.699	20.155	19.699	20.156	19.700	84.456
Ghumshar South	Badagada	Khajuridiha	Lembakumba	Block Plantation	30	1	19.672	84.477	19.672	20.148	19.672	20.148	19.672	84.477
Ghumshar North	Central	Bhanjanagar	Jillundi	ANR with GAP	50	1	20.066	84.586	20.061	20.646	20.061	20.641	20.066	84.581
Ghumshar North	Central	Bhanjanagar	Jillundi	ANR with GAP	50	2	20.032	84.584	20.037	20.621	20.037	20.614	20.032	84.579
Ghumshar North	Central	Bhanjanagar	Jillundi	ANR with GAP	50	3	20.026	84.551	20.030	20.836	20.033	20.841	20.031	84.552
Ghumshar North	Central	Gangapur	Dumdum	Avenue Plantation	2 kms	1	19.915	84.616	0.000	0.000	19.913	20.516	19.911	84.855
Ghumshar North	Central	Gangapur	Dumdum	Avenue Plantation	2 kms	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ghumshar North	Mujagada	Bhanjanagar	Gallery RF C/5	ANR with GAP	50	1	19.962	84.538	19.960	20.498	19.961	20.498	19.960	84.538
Ghumshar North	Mujagada	Bhanjanagar	Gallery RF C/5	ANR with GAP	50	2	19.959	84.539	19.959	20.497	19.959	20.497	19.959	84.539
Ghumshar North	Mujagada	Bhanjanagar	Gallery RF C/5	ANR with GAP	50	3	19.961	84.543	19.962	20.505	19.937	20.493	19.943	84.534
Ghumshar North	Mujagada	Bhanjanagar	Gallery RF C/5	Block Plantation	70	1	19.972	84.525	19.973	20.497	20.056	20.581	19.972	84.525
Ghumshar North	Mujagada	Bhanjanagar	Gallery RF C/5	Block Plantation	70	2	19.973	84.527	19.973	20.500	19.973	20.500	19.973	84.527
Ghumshar North	Mujagada	Bhanjanagar	Gallery RF C/5	Block Plantation	70	3	19.972	84.527	19.972	20.499	19.972	20.499	19.972	84.527

Division	Range	Section	Beat	Type of Assets	Area of the site (Ha)	plot number	Latitude / Longitude (Degree Decimal)							
							Latitude 1	Longitude 1	Latitude 2	Longitude 2	Latitude 3	Longitude 3	Latitude 4	Longitude 4
Ghumsur North	Mujagada	Bhanjanagar	Gallery RF C/5	Block Plantation	70	4	19.974	84.527	19.974	20.501	19.974	20.501	19.974	84.527
Ghumsur North	Mujagada	Bhanjanagar	Hathiguda South	SSO Bamboo	200	1	19.941	84.541	19.941	20.482	19.941	20.482	19.941	84.541
Ghumsur North	Mujagada	Bhanjanagar	Hathiguda South	SSO Bamboo	200	2	19.941	84.541	19.942	20.482	19.942	20.482	19.941	84.540
Ghumsur North	Mujagada	Bhanjanagar	Hathiguda South	SSO Bamboo	200	3	19.941	84.540	19.941	20.482	19.941	20.481	19.941	84.540
Ghumsur North	Mujagada	Bhanjanagar	Hathiguda South	SSO Bamboo	200	4	19.941	84.541	19.942	20.483	19.942	20.483	19.942	84.541
Ghumsur North	Mujagada	Bhanjanagar	Hathiguda South	SSO Bamboo	200	5	19.942	84.541	19.942	20.483	19.942	20.483	19.942	84.541
Ghumsur North	Tarasingi	Ghogada	Ghogada	Management of Old Teak	45	1	20.223	84.809	20.223	21.032	20.222	21.031	20.222	84.809
Ghumsur North	Tarasingi	Ghogada	Ghogada	Management of Old Teak	45	2	20.223	84.809	20.223	21.032	20.223	21.032	20.223	84.809
Ghumsur North	Tarasingi	Tarasingi	Tarasingi	ANR without Gap	150	1	20.080	84.678	20.081	20.759	20.080	20.759	20.081	84.678
Ghumsur North	Tarasingi	Tarasingi	Tarasingi	ANR without Gap	150	2	20.081	84.678	20.081	20.760	20.081	20.760	20.081	84.678
Ghumsur North	Tarasingi	Tarasingi	Tarasingi	ANR without Gap	150	3	20.081	84.678	20.081	20.759	20.081	20.759	20.081	84.678
Ghumsur North	Tarasingi	Tarasingi	Tarasingi	ANR without Gap	150	4	20.081	84.677	20.081	20.759	20.081	20.758	20.081	84.677
Ghumsur North	Tarasingi	Tarasingi	Tarasingi	ANR without Gap	150	5	20.082	84.677	20.082	20.759	20.082	20.759	20.082	84.676
Berhampur	Digapahandi	Nuapada	Nuapada	Bald hill plantation	15	1	19.213	84.516	19.214	19.729	19.213	19.729	19.213	84.516
Berhampur	Digapahandi	Patapur		Bald hill plantation	10	1	19.437	84.563	19.437	20.000	19.437	20.000	19.437	84.563

Division	Range	Section	Beat	Type of Assets	Area of the site (Ha)	plot number	Latitude / Longitude (Degree Decimal)							
							Latitude 1	Longitude 1	Latitude 2	Longitude 2	Latitude 3	Longitude 3	Latitude 4	Longitude 4
Berhampur	Digapahandi	Digapahandi	B. Turubudi	Block plantation	50	1	19.300	84.630	19.300	19.930	19.300	19.930	19.299	84.630
Berhampur	Digapahandi	Digapahandi	B. Turubudi	Block plantation	50	2	19.299	84.630	19.299	19.929	19.299	19.929	19.299	84.630
Berhampur	Digapahandi	Digapahandi	B. Turubudi	Block plantation	50	3	19.299	84.631	19.299	19.930	19.299	19.929	19.299	84.630
Berhampur	Khalikote	Rambha	Biruliguda	ANR with Gap	50	1	19.482	85.069	19.482	19.551	19.483	19.552	19.482	84.069
Berhampur	Khalikote	Rambha	Biruliguda	ANR with Gap	50	2	19.484	85.069	19.484	19.553	0.000	0.000	0.000	0.000
Berhampur	Khalikote	Rambha	Biruliguda	ANR with Gap	50	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Berhampur	Khalikote	Narayani	Narayani	Management of Old Teak	20	1	19.694	85.140	19.695	19.835	19.694	19.834	0.000	0.000
Berhampur	Berhampur	Tamana	Baniamari	SSO Bamboo	30	1	19.248	84.668	19.248	19.916	19.248	19.916	19.248	84.667
Berhampur	Berhampur	Tamana	Baniamari	SSO Bamboo	30	2	19.248	84.668	19.248	19.916	19.248	19.916	19.248	84.668
Berhampur	Berhampur	Tamana	Burugaon	ANR with Gap	100	1	19.288	84.703	19.288	19.991	19.288	19.991	19.288	84.702
Berhampur	Berhampur	Tamana	Burugaon	ANR with Gap	100	2	19.288	84.703	19.288	19.991	19.288	19.991	19.288	84.703
Berhampur	Berhampur	Tamana	Burugaon	ANR with Gap	100	3	19.288	84.703	19.289	19.991	19.289	19.991	19.289	84.702
Berhampur	Berhampur	Tamana	Burugaon	ANR with Gap	100	4	19.289	84.703	19.289	19.992	19.289	19.992	19.289	84.703
Berhampur	Berhampur	Tamana	Burugaon	ANR with Gap	100	5	19.289	84.703	19.289	19.992	19.289	19.992	19.289	84.703
Paralakhemundi	Chandragiri	Chandragiri	Labarsingh	Block Plantation	30	1	19.396	84.437	19.395	19.837	19.400	19.838	19.400	84.440
Paralakhemundi	Chandragiri	Chandragiri	Labarsingh	Block Plantation	30	2	19.395	84.437	19.395	19.833	19.396	19.833	19.396	84.437
Paralakhemundi	Chandragiri	Podamari	T. Gobindapur	SSO Bamboo	200	1	19.495	84.407	19.495	19.902	19.495	19.903	19.495	84.408
Paralakhemundi	Chandragiri	Podamari	T. Gobindapur	SSO Bamboo	200	2	19.494	84.407	19.494	19.901	19.494	19.901	19.494	84.407
Paralakhemundi	Chandragiri	Podamari	T. Gobindapur	SSO Bamboo	200	3	19.494	84.407	19.494	19.902	19.494	19.901	19.494	84.407
Paralakhemundi	Chandragiri	Podamari	T. Gobindapur	SSO Bamboo	200	4	19.494	84.407	19.494	19.902	19.495	19.902	19.495	84.407
Paralakhemundi	Chandragiri	Podamari	T. Gobindapur	SSO Bamboo	200	5	19.495	84.407	19.495	19.902	19.495	19.903	19.495	84.407
Paralakhemundi	Mohendra	Narayanpur	Narayanpur-2	ANR with Gap	100	1	18.893	84.173	18.893	19.066	18.893	19.070	18.893	84.173



Division	Range	Section	Beat	Type of Assets	Area of the site (Ha)	plot number	Latitude / Longitude (Degree Decimal)							
							Latitude 1	Longitude 1	Latitude 2	Longitude 2	Latitude 3	Longitude 3	Latitude 4	Longitude 4
Paralakhemundi	Mohendra	Narayanpur	Narayanpur-2	ANR with Gap	100	2	18.894	84.174	18.894	19.067	18.893	19.067	18.894	84.173
Paralakhemundi	Mohendra	Narayanpur	Narayanpur-2	ANR with Gap	100	3	18.893	84.173	18.893	19.067	18.893	19.066	18.893	84.174
Paralakhemundi	Mohendra	Narayanpur	Narayanpur-2	ANR with Gap	100	4	18.893	84.174	18.893	19.067	18.892	19.067	18.893	84.174
Paralakhemundi	Mohendra	Narayanpur	Narayanpur-2	ANR with Gap	100	5	18.893	84.174	18.894	19.068	18.893	19.067	18.893	84.174
Paralakhemundi	Mohendra	Narayanpur	Narayanpur-2	Avenue Plantation	5RKM	1	18.898	84.173	0.000	0.000	0.000	0.000	0.000	0.000
Paralakhemundi	Mohendra	Garabandha	Garabandha	ANR with Gap		1	18.811	84.274	18.811	19.064	18.811	19.064	18.811	84.253
Paralakhemundi	Mohendra	Garabandha	Garabandha	ANR with Gap		2	18.813	84.252	18.812	19.065	18.813	19.065	18.812	84.253
Paralakhemundi	Mohendra	Garabandha	Garabandha	ANR with Gap		3	18.812	84.253	18.813	19.066	18.812	19.066	18.812	84.253
Paralakhemundi	Mohendra	Garabandha	Garabandha	ANR with Gap		4	18.812	84.253	18.812	19.065	18.812	19.065	18.812	84.253
Paralakhemundi	Mohendra	Garabandha	Garabandha	ANR with Gap		5	18.811	84.253	18.811	19.064	18.811	19.064	18.811	84.253
Paralakhemundi	Mohendra	Garabandha	Lavaynagarh	ANR without Gap	100	1	18.811	84.320	18.811	19.131	18.811	19.132	18.811	84.320
Paralakhemundi	Mohendra	Garabandha	Lavaynagarh	ANR without Gap	100	2	18.812	84.321	18.812	19.133	18.812	19.133	18.812	84.321
Paralakhemundi	Mohendra	Garabandha	Lavaynagarh	ANR without Gap	100	3	18.812	84.320	18.812	19.133	18.812	19.133	18.812	84.321
Paralakhemundi	Mohendra	Garabandha	Lavaynagarh	ANR without Gap	100	4	18.811	84.321	18.811	19.132	18.811	19.132	18.811	84.321
Paralakhemundi	Mohendra	Garabandha	Lavaynagarh	ANR without Gap	100	5	18.810	84.321	18.810	19.131	18.810	19.131	18.810	84.321
Paralakhemundi	Devgiri	Paralakhemundi	Bidua	ANR with Gap	50	1	18.696	84.162	18.746	18.988	18.797	19.007	18.747	84.132
Paralakhemundi	Devgiri	Paralakhemundi	Bidua	ANR with Gap	50	2	18.976	84.199	18.976	19.144	18.975	19.065	18.924	84.116
Paralakhemundi	Devgiri	Paralakhemundi	Bidua	ANR with Gap	50	3	18.860	84.082	18.911	19.069	18.861	19.052	18.810	84.110
Paralakhemundi	Devgiri	Paralakhemundi	Bidua	ANR without Gap (AJY)	50	1	18.819	84.092	18.819	18.912	18.819	18.911	18.819	84.092
Paralakhemundi	Devgiri	Paralakhemundi	Bidua	ANR without Gap (AJY)	50	2	18.821	84.092	18.821	18.913	18.821	18.913	18.821	84.092

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							Latitude 1	Longitude 1	Latitude 2	Longitude 2	Latitude 3	Longitude 3	Latitude 4	Longitude 4
Paralakhemundi	Devgiri	Paralakhemundi	Bidua	ANR without Gap (AJY)	50	3	18.823	84.092	18.823	18.915	18.822	18.914	18.822	84.092
Phulbani	Phulbani	Khajuripada	Dalapada	Block plantation	20	1	20.389	84.399	20.389	20.789	20.389	20.788	20.389	84.399
Phulbani	Phulbani	Bisipada	Gumagada	ANR with Gap	50	1	20.369	84.281	20.369	20.650	20.370	20.650	20.369	84.281
Phulbani	Phulbani	Bisipada	Gumagada	ANR with Gap	50	2	20.370	84.281	20.370	20.651	20.370	20.651	20.370	84.281
Phulbani	Phulbani	Bisipada	Gumagada	ANR with Gap	50	3	20.370	84.281	20.370	20.652	20.370	20.652	20.370	84.281
Phulbani	G.Udaygiri	Paburia	Paburia	ANR with Gap	150	1	20.135	84.328	20.134	20.462	20.135	20.462	20.135	84.327
Phulbani	G.Udaygiri	Paburia	Paburia	ANR with Gap	150	2	20.138	84.325	20.138	20.463	20.137	20.463	20.138	84.325
Phulbani	G.Udaygiri	Paburia	Paburia	ANR with Gap	150	3	20.137	84.325	20.137	20.463	20.137	20.463	20.137	84.325
Phulbani	G.Udaygiri	Paburia	Paburia	ANR with Gap	150	4	20.137	84.326	20.137	20.463	20.138	20.463	20.138	84.326
Phulbani	G.Udaygiri	Paburia	Paburia	ANR with Gap	150	5	20.138	84.326	20.138	20.464	20.138	20.464	20.138	84.325
Phulbani	G.Udaygiri	G.Udaygiri	G.Udaygiri	ANR with Gap	200	1	20.145	84.302	20.146	20.448	20.145	20.448	20.014	84.303
Phulbani	G.Udaygiri	G.Udaygiri	G.Udaygiri	ANR with Gap	200	2	20.014	84.302	20.014	20.317	20.015	20.317	20.014	84.302
Phulbani	G.Udaygiri	G.Udaygiri	G.Udaygiri	ANR with Gap	200	3	20.014	84.303	20.015	20.318	20.015	20.318	20.015	84.303
Phulbani	G.Udaygiri	G.Udaygiri	G.Udaygiri	ANR with Gap	200	4	20.014	84.303	20.015	20.317	20.015	20.317	20.015	84.302
Phulbani	G.Udaygiri	G.Udaygiri	G.Udaygiri	ANR with Gap	200	5	20.015	84.302	20.015	20.317	20.015	20.317	20.015	84.302
Phulbani	G.Udaygiri	Kalinga	Kalinga	ANR with Gap	150	1	20.145	84.399	20.145	20.543	20.145	20.543	20.145	84.399
Phulbani	G.Udaygiri	Kalinga	Kalinga	ANR with Gap	150	2	20.144	84.398	20.144	20.543	20.145	20.543	20.145	84.398
Phulbani	G.Udaygiri	Kalinga	Kalinga	ANR with Gap	150	3	20.144	84.399	20.144	20.543	20.144	20.543	20.144	84.399
Phulbani	G.Udaygiri	Kalinga	Kalinga	ANR with Gap	150	4	20.145	84.399	20.145	20.544	20.145	20.544	20.145	84.399
Phulbani	G.Udaygiri	Kalinga	Kalinga	ANR with Gap	150	5	20.144	84.399	20.144	20.544	20.144	20.544	20.145	84.399
Phulbani	Phiringia	Gochapada	Krandibali	SSO Bamboo	1700	1	20.399	83.964	20.398	21.362	20.399	21.363	20.399	83.964
Phulbani	Phiringia	Gochapada	Krandibali	SSO Bamboo	1700	2	20.399	83.964	20.399	21.363	20.399	21.363	20.399	83.964
Phulbani	Phiringia	Gochapada	Krandibali	SSO Bamboo	1700	3	20.399	83.964	20.399	21.363	20.399	21.363	20.399	83.964
Phulbani	Phiringia	Gochapada	Krandibali	SSO Bamboo	1700	4	20.398	83.963	20.399	21.362	20.399	21.362	20.399	83.963
Phulbani	Phiringia	Gochapada	Krandibali	SSO Bamboo	1700	5	20.399	83.964	20.399	21.363	20.399	21.363	20.399	83.963

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							Latitude 1	Longitude 1	Latitude 2	Longitude 2	Latitude 3	Longitude 3	Latitude 4	Longitude 4
Phulbani	Phiringia	Balandapada	Bakari	ANR without Gap	150	1	20.470	83.913	20.470	21.383	20.470	21.383	20.470	83.912
Phulbani	Phiringia	Balandapada	Bakari	ANR without Gap	150	2	20.471	83.913	20.471	21.384	20.471	21.383	20.471	83.912
Phulbani	Phiringia	Balandapada	Bakari	ANR without Gap	150	3	20.470	83.912	20.470	21.383	20.471	21.383	20.470	83.912
Phulbani	Phiringia	Balandapada	Bakari	ANR without Gap	150	4	20.471	83.912	20.471	21.383	20.471	21.383	20.471	83.912
Phulbani	Phiringia	Balandapada	Bakari	ANR without Gap	150	5	20.471	83.912	20.471	21.384	20.471	21.384	20.471	83.912
Phulbani	Phiringia	Nuapadara	Rabingia KF	ANR without Gap	50	1	20.311	84.046	20.311	20.358	20.311	20.358	20.311	84.047
Phulbani	Phiringia	Nuapadara	Rabingia KF	ANR without Gap	50	2	20.312	84.048	20.311	20.359	20.311	20.359	20.312	84.048
Phulbani	Phiringia	Nuapadara	Rabingia KF	ANR without Gap	50	3	20.310	84.047	20.310	20.357	20.310	20.358	20.310	84.047
Boudh	Boudh	Khajuripada	Brahmanipati	ANR with Gap	100	1	20.715	84.169	20.715	20.884	20.702	20.874	20.712	84.178
Boudh	Boudh	Khajuripada	Brahmanipati	ANR with Gap	100	2	20.715	84.168	20.715	20.884	20.715	20.883	20.715	84.168
Boudh	Boudh	Khajuripada	Brahmanipati	ANR with Gap	100	3	20.715	84.169	20.715	20.885	20.715	20.884	20.715	84.169
Boudh	Boudh	Khajuripada	Brahmanipati	ANR with Gap	100	4	20.715	84.170	20.715	20.885	20.715	20.885	20.715	84.170
Boudh	Boudh	Khajuripada	Brahmanipati	ANR with Gap	100	5	20.714	84.170	20.714	20.884	20.714	20.884	20.714	84.170
Boudh	Boudh	Boudh	Devgarh	Block Plantation	65	1	20.735	84.298	20.450	20.739	20.735	21.033	20.735	84.297
Boudh	Boudh	Boudh	Devgarh	Block Plantation	65	2	20.407	84.248	20.407	20.655	20.407	20.654	20.407	84.248
Boudh	Boudh	Boudh	Devgarh	Block Plantation	65	3	20.406	84.247	20.406	20.654	20.406	20.653	20.406	84.247
Boudh	Puruna Cuttack	Charichaka	Charichaka	ANR with Gap	100	1	20.596	84.443	20.596	21.039	20.596	21.039	20.596	84.443
Boudh	Puruna Cuttack	Charichaka	Charichaka	ANR with Gap	100	2	20.598	84.443	20.598	21.041	20.597	21.040	20.597	84.443



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Boudh	Puruna Cuttack	Charichaka	Charichaka	ANR with Gap	100	3	20.597	84.443	20.597	21.040	20.596	21.039	20.596	84.442
Boudh	Puruna Cuttack	Charichaka	Charichaka	ANR with Gap	100	4	20.596	84.443	20.596	21.039	20.595	21.038	20.595	84.442
Boudh	Puruna Cuttack	Charichaka	Charichaka	ANR with Gap	100	5	20.595	84.443	20.595	21.039	20.595	21.038	20.595	84.443
Boudh	Puruna Cuttack	Puruna Cuttack	Sakasingha	Block Plantation	17	1	20.678	84.483	20.678	21.164	20.678	21.165	20.678	84.492
Boudh	Madhapur	Adenigarh	Adenigarh	ANR with Gap	50	1	20.514	84.453	20.756	21.228	20.514	20.967	20.514	84.453
Boudh	Madhapur	Adenigarh	Adenigarh	ANR with Gap	50	2	20.514	84.459	20.753	21.214	20.514	20.976	20.514	84.460
Boudh	Madhapur	Adenigarh	Adenigarh	ANR with Gap	50	3	20.515	84.459	20.515	20.974	20.515	20.974	20.515	84.459
Boudh	Madhapur	Baring	Baring	SSO Bamboo		1	20.419	84.573	20.419	20.992	20.419	20.991	20.419	84.573
Boudh	Madhapur	Baring	Baring	SSO Bamboo		2	20.420	84.572	20.420	20.992	20.419	20.992	20.419	84.572
Boudh	Madhapur	Baring	Baring	SSO Bamboo		3	20.419	84.572	20.419	20.991	20.419	20.991	20.419	84.572
Boudh	Madhapur	Baring	Baring	SSO Bamboo		4	20.419	84.572	20.419	20.991	20.418	20.991	20.418	84.572
Boudh	Madhapur	Baring	Baring	SSO Bamboo		5	20.418	84.572	20.418	20.990	20.418	20.990	20.418	84.572
Boudh	Madhapur	Baring	Kochida	SSO Timber	390	1	20.436	84.490	20.435	20.925	20.435	20.925	20.435	84.640
Boudh	Madhapur	Baring	Kochida	SSO Timber	390	2	20.427	84.488	20.427	20.917	20.426	20.915	20.427	84.488
Boudh	Madhapur	Baring	Kochida	SSO Timber	390	3	20.436	84.490	20.436	20.926	20.436	20.926	20.436	84.490
Boudh	Madhapur	Baring	Kochida	SSO Timber	390	4	20.435	84.490	20.435	20.925	20.434	20.925	20.435	84.490
Boudh	Madhapur	Baring	Kochida	SSO Timber	390	5	20.434	84.489	20.434	20.924	20.434	20.923	20.434	84.489
Balliguda	Simanbadi	Simanbadi	Badabanga	SSO Timber	775	1	19.980	84.046	19.975	20.122	19.975	20.122	19.976	84.147
Balliguda	Simanbadi	Simanbadi	Badabanga	SSO Timber	775	2	19.976	84.146	19.976	20.122	19.975	20.122	19.976	84.146
Balliguda	Simanbadi	Simanbadi	Badabanga	SSO Timber	775	3	19.975	84.146	19.975	20.121	19.975	20.121	19.975	84.146
Balliguda	Simanbadi	Simanbadi	Badabanga	SSO Timber	775	4	19.975	84.147	19.975	20.122	19.974	20.121	19.974	84.147
Balliguda	Simanbadi	Simanbadi	Badabanga	SSO Timber	775	5	19.974	84.146	19.974	20.121	19.974	20.120	19.974	84.146
Balliguda	Simanbadi	Budhaguda	Budhaguda	ANR with Gap	70	1	20.025	84.447	20.025	20.972	20.292	21.406	20.025	83.947
Balliguda	Simanbadi	Budhaguda	Budhaguda	ANR with Gap	70	2	20.024	83.948	20.024	20.972	20.024	20.972	20.024	83.948
Balliguda	Simanbadi	Budhaguda	Budhaguda	ANR with Gap	70	3	20.025	83.948	20.026	20.973	20.026	20.973	20.025	83.947
Balliguda	Simanbadi	Budhaguda	Budhaguda	ANR with Gap	70	4	20.026	83.948	20.027	20.975	20.027	20.975	20.026	83.948

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							Latitude 1	Longitude 1	Latitude 2	Longitude 2	Latitude 3	Longitude 3	Latitude 4	Longitude 4
Balliguda	Simanbadi	Budhaguda	Tillory	ANR without Gap (AJY)	50	1	19.997	83.997	19.997	20.994	19.997	20.994	19.997	83.997
Balliguda	Simanbadi	Budhaguda	Tillory	ANR without Gap (AJY)	50	2	19.997	83.997	19.997	20.994	19.997	20.994	19.997	83.997
Balliguda	Simanbadi	Budhaguda	Tillory	ANR without Gap (AJY)	50	3	19.997	83.997	19.997	20.994	19.997	20.994	19.997	83.997
Balliguda	Tumudibandha	Durgaponga	Naliguda	Block plantation	5	1	19.719	83.936	19.717	20.654	19.721	20.662	19.721	83.936
Balliguda	Tumudibandha	Kotogarh	Dhenuguda	ANR with Gap	50	1	19.798	83.724	19.798	20.524	19.798	20.524	19.798	83.726
Balliguda	Tumudibandha	Kotogarh	Dhenuguda	ANR with Gap	50	2	19.798	83.726	19.799	20.525	19.799	20.525	19.799	83.726
Balliguda	Tumudibandha	Kotogarh	Dhenuguda	ANR with Gap	50	3	19.798	83.726	19.798	20.525	19.798	20.525	19.798	83.726
Balliguda	Tumudibandha	Kotogarh	Gumpadar	SSO Bamboo	800	1	19.866	83.968	19.866	20.835	19.866	20.835	19.866	83.968
Balliguda	Tumudibandha	Kotogarh	Gumpadar	SSO Bamboo	800	2	19.866	83.968	19.866	20.835	19.850	20.819	19.867	83.968
Balliguda	Tumudibandha	Kotogarh	Gumpadar	SSO Bamboo	800	3	19.866	83.967	19.866	20.834	19.867	20.834	19.867	83.967
Balliguda	Tumudibandha	Kotogarh	Gumpadar	SSO Bamboo	800	4	19.867	83.968	19.850	20.818	19.850	20.818	19.850	83.968
Balliguda	Tumudibandha	Kotogarh	Gumpadar	SSO Bamboo	800	5	19.850	83.967	19.851	20.818	19.851	20.818	19.851	83.967
Balliguda	Balliguda	Balliguda	Balliguda	Block plantation	5	1	20.259	84.074	20.260	21.330	20.255	21.323	20.254	84.072
Balliguda	Balliguda	Balliguda	Bataguda	ANR with Gap	50	1	20.245	84.156	20.249	21.404	20.252	21.411	20.248	84.160
Balliguda	Balliguda	Balliguda	Bataguda	ANR with Gap	50	2	20.244	84.156	20.244	20.401	20.244	20.401	20.244	84.156
Balliguda	Balliguda	Balliguda	Bataguda	ANR with Gap	50	3	20.245	84.156	20.245	20.401	20.245	20.401	20.245	84.156

## II. Geo Tagging of Sampled out of Plantation activities under Angul Circle

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Satakosia Wild Life	Tikarpada	Majhipada	Naleswar	Block Plantation	AN1.1	5	2009-10	20	37	31.4	84	43	38.5
Satakosia Wild Life	Pampasara	Kumari	Hinjadali	ANR with gap Plantation	AN2.1	101.65	2011-12	20	45	1	84	50	25.3
Satakosia Wild Life	Pampasara	Kumari	Hinjadali	ANR with gap Plantation	AN2.2	101.65	2011-12	20	45	6.87	84	50	25.05
Satakosia Wild Life	Pampasara	Kumari	Hinjadali	ANR with gap Plantation	AN2.3	101.65	2011-12	20	45	4.33	84	50	16.53
Satakosia Wild Life	Pampasara	Kumari	Hinjadali	ANR with gap Plantation	AN2.4	101.65	2011-12	20	45	13.32	84	50	30
Satakosia Wild Life	Pampasara	Kumari	Hinjadali	ANR with gap Plantation	AN2.5	101.65	2011-12	20	45	2.5	84	50	20.7
Satakosia Wild Life	Purunakote	Baghamunda	Baghamunda-A	ANR without Gap (AJY)	AN3.1	50	2014-15	20	44	35.7	84	46	25
Satakosia Wild Life	Purunakote	Baghamunda	Baghamunda-A	ANR without Gap (AJY)	AN3.2	50	2014-15	20	44	36.99	84	46	27.11
Mahanadi Wild Life	Banigochha East	Takera	Takera	Block Plantation	AN4.1	30	2009-10	20	24	58.2	84	46	34.1
Mahanadi Wild Life	Banigochha East	Takera	Takera	Block Plantation	AN4.2	30	2009-10	20	24	56.8	84	46	30.1
Mahanadi Wild Life	Chhamundia	Chhamundia	Rajinji	Block Plantation	AN5.1	50	2009-10	20	28	7.2	84	56	59
Mahanadi Wild Life	Chhamundia	Chhamundia	Rajinji	Block Plantation	AN5.2	50	2009-10	20	28	5.3	84	56	57.4
Mahanadi Wild Life	Kusanga	Kusanga	Nuapada	Block Plantation	AN6.1	10	2009-10	20	34	8.4	84	42	45.8
Angul	Bantala	Kanja	Pokatunga	Bald Hill Plantation	AN7.1	25	2011-12	20	44	53.9	85	8	29.9
Angul	Bantala	Kanja	Kanja	SSO Bamboo	AN8.1	100	2013-14	20	38	18.4	85	7	22.9



Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Angul	Bantala	Kanja	Kanja	SSO Bamboo	AN8.2	100	2013-14	20	38	15.66	85	6	58.17
Angul	Bantala	Kanja	Kanja	SSO Bamboo	AN8.3	100	2013-14	20	38	8.72	85	7	52.18
Angul	Bantala	Kanja	Kanja	SSO Bamboo	AN8.4	100	2013-14	20	38	6.16	85	6	36.97
Angul	Chhendipada	Raighar	Jamunda	ANR with gap Plantation	AN9.1	100	2015-16	20	54	40.3	84	56	52.8
Angul	Chhendipada	Raighar	Jamunda	ANR with gap Plantation	AN9.2	100	2015-16	20	54	20.2	84	56	51.2
Angul	Chhendipada	Raighar	Jamunda	ANR with gap Plantation	AN9.3	100	2015-16	20	54	54.12	84	56	44.32
Angul	Chhendipada	Raighar	Jamunda	ANR with gap Plantation	AN9.4	100	2015-16	20	54	38.99	84	56	37.49
Angul	Chhendipada	Chhendipada	Chhendipada	Block Plantation	AN10.1	35	2009-10	21	7	42.3	84	53	59.5
Angul	Chhendipada	Chhendipada	Chhendipada	Block Plantation	AN10.2	35	2009-10	21	7	43.04	84	53	59.22
Angul	Chhendipada	Raijharan	Raijharan	SSO Timber	AN11.1	159	2012-13	20	54	4.6	84	56	51.2
Angul	Chhendipada	Raijharan	Raijharan	SSO Timber	AN11.2	159	2012-13	20	54	6.1	84	56	50.7
Angul	Chhendipada	Raijharan	Raijharan	SSO Timber	AN11.3	159	2012-13	20	54	7.51	84	56	48.9
Angul	Chhendipada	Raijharan	Raijharan	SSO Timber	AN11.4	159	2012-13	20	54	2.13	84	56	48.95
Angul	Chhendipada	Raijharan	Raijharan	SSO Timber	AN11.5	159	2012-13	20	54	4.03	84	56	47.5
Angul	Kaniha	Kaniha 2	Sapakata	ANR without Gap (AJY)	AN12.1	51.75	2016-17	21	30	9.2	84	58	30.7
Angul	Kaniha	Kaniha 2	Sapakata	ANR without Gap (AJY)	AN12.2	51.75	2016-17	21	30	8.53	84	58	29.86
Angul	Kaniha	Kaniha 2	Sapakata	Block Plantation	AN13.1	50	2009-10	21	10	1.9	85	1	3.3
Angul	Kaniha	Kaniha 2	Sapakata	Block Plantation	AN13.2	50	2009-10	21	10	1.1	85	1	1.9
Angul	Kaniha	Kaniha 2	Dalak	ANR with gap Plantation	AN14.1	120	2014-15	21	10	1.1	85	4	1.9
Angul	Kaniha	Kaniha 2	Dalak	ANR with gap Plantation	AN14.2	120	2014-15	21	9	42.6	85	4	24.9
Angul	Kaniha	Kaniha 2	Dalak	ANR with gap Plantation	AN14.3	120	2014-15	21	9	42.4	85	4	26.9

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Angul	Kaniha	Kaniha 2	Dalak	ANR with gap Plantation	AN14.4	120	2014-15	21	9	43.03	85	4	30.35
Angul	Kaniha	Kaniha 2	Dalak	ANR with gap Plantation	AN14.5	120	2014-15	21	9	46.17	85	4	27.89
Dhenkanal	Sadangi	Sadangi	Kasipur	ANR with gap Plantation	AN15.1	50	2015-16	20	46	42.9	85	53	19.2
Dhenkanal	Sadangi	Sadangi	Kasipur	ANR with gap Plantation	AN15.2	50	2015-16	20	46	42	85	53	18.5
Dhenkanal	Sadangi	Sadangi	Sadangi	Block Plantation	AN16.1	55	2009-10	20	49	11.8	85	50	16.1
Dhenkanal	Sadangi	Sadangi	Sadangi	Block Plantation	AN16.2	55	2009-10	20	49	9.95	85	50	14.98
Dhenkanal	Sadangi	Sadangi	Sadangi	Block Plantation	AN16.3	55	2009-10	20	49	11.58	85	50	19.6
Dhenkanal	Hindol	Hindol	Hindol	Bamboo plantation	AN17.1	760	2016-17	20	34	29.4	85	13	7.2
Dhenkanal	Hindol	Hindol	Hindol	Bamboo plantation	AN17.2	760	2016-17	20	34	27.6	85	13	11.4
Dhenkanal	Hindol	Hindol	Hindol	Bamboo plantation	AN17.3	760	2016-17	20	34	34.27	85	13	8.96
Dhenkanal	Hindol	Hindol	Hindol	Bamboo plantation	AN17.4	760	2016-17	20	34	23.36	85	13	12.09
Dhenkanal	Hindol	Hindol	Hindol	Bamboo plantation	AN17.5	760	2016-17	20	34	26.89	85	13	18.98
Dhenkanal	Hindol	Dandari	Gurujangu	Block Plantation	AN18.1	60	2010-11	20	31	53.4	85	18	4.5
Dhenkanal	Hindol	Dandari	Gurujangu	Block Plantation	AN18.2	60	2010-11	20	31	64.4	85	18	4.7
Dhenkanal	Hindol	Dandari	Gurujangu	Block Plantation	AN18.3	60	2010-11	20	31		85	18	
Dhenkanal	Hindol	Dandari	Gurujangu	ANR with gap Plantation	AN19.1	32	2016-17	20	32	29.4	85	16	31.9
Dhenkanal	Hindol	Dandari	Gurujangu	ANR with gap Plantation	AN19.2	32	2016-17	20	32	29.3	85	16	36.3
Dhenkanal	Sadar	Sadar	Mahirapat	Block Plantation	AN20.1	40	2010-11	20	38	12.5	85	34	16.4
Dhenkanal	Sadar	Sadar	Mahisapat	Block Plantation	AN20.2	40	2010-11	20	38	4	85	34	17.8

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Dhenkanal	Sadar	Sadar	Mahisapat	ANR with gap Plantation	AN21.1	40	2010-11	20	36	37.5	85	35	42.9
Dhenkanal	Sadar	Sadar	Mahisapat	ANR with gap Plantation	AN21.2	40	2010-11	20	36	28.91	85	35	42.49
Athamallik	Bamur	Kadalimunda	Tentalapai	Block Plantation	AN22.1	15	2014-15	20	52	13.8	84	24	45.2
Athamallik	Bamur	Kadalimunda	Tentalapai	Block Plantation	AN23.1	30	2009-10	20	53	6.6	84	25	29.9
Athamallik	Bamur	Kadalimunda	Tentalapai	Block Plantation	AN23.2	30	2009-10	20	53	6.54	84	25	36.57
Athamallik	Bamur	Kishor Nagar	Himtira	ANR with gap Plantation	AN24.1	50	2015-16	20	56	4.9	84	28	15.2
Athamallik	Bamur	Kishor Nagar	Himtira	ANR with gap Plantation	AN24.2	50	2015-16	20	65	12.5	84	28	54
Athamallik	Madhapur	Kiakata	Ghodagadi	ANR with gap Plantation	AN25.1	67.5	2015-16	20	53	24.7	84	21	15.8
Athamallik	Madhapur	Kiakata	Ghodagadi	ANR with gap Plantation	AN25.2	67.5	2015-16	20	53	17.68	84	21	19.77
Athamallik	Madhapur	Kiakata	Ghodagadi	ANR with gap Plantation	AN25.3	67.5	2015-16	20	53	23.63	84	21	29.1
Athamallik	Madhapur	Kiakata	Ghodagadi	Block Plantation	AN26.1	20	2010-11	20	53	5.6	84	21	23.9
Athamallik	Handapa	Handapa	Handapa	Block Plantation	AN27.1	26.74	2015-16	20	54	55.7	84	39	55.6
Athamallik	Handapa	Handapa	Handapa	Block Plantation	AN27.2	26.74	2015-16	20	54	58.79	84	39	56.59
Athamallik	Handapa	Urkala	Tileswar	Avenue Plantation	AN28.1	9	2012-13	20	56	39.6	84	38	44.1
Cuttack	Sukinda	Sukinda	Sukinda	ANR with gap Plantation	AN29.1	200	2014-15	20	56	35.6	85	56	14.7
Cuttack	Sukinda	Sukinda	Sukinda	ANR with gap Plantation	AN29.2	200	2014-15	20	56	33.26	85	56	26.82
Cuttack	Sukinda	Sukinda	Sukinda	ANR with gap Plantation	AN29.3	200	2014-15	20	56	43.54	85	56	11.81
Cuttack	Sukinda	Sukinda	Sukinda	ANR with gap Plantation	AN29.4	200	2014-15	20	56	56.55	85	56	8.88



Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Cuttack	Sukinda	Sukinda	Sukinda	ANR with gap Plantation	AN29.5	200	2014-15	20	56	31.1	85	56	41.09
Cuttack	Sukinda	Sukinda	Haripur	Block Plantation	AN30.1	50	2009-10	20	54	39.3	85	58	22.7
Cuttack	Sukinda	Sukinda	Haripur	Block Plantation	AN30.2	50	2009-10	20	54	35.74	85	58	22.41
Cuttack	Sukinda	Sukinda	Haripur	Bald Hill Plantation	AN31.1	20	2015-16	20	54	32.9	85	59	22.8
Cuttack	Dalijoda	Chandikhol	Chandikhol	Block Plantation	AN32.1	60	2009-10	20	39	56.7	86	6	3.9
Cuttack	Dalijoda	Chandikhol	Chandikhol	Block Plantation	AN32.2	60	2009-10	20	39	55.44	86	6	9.95
Cuttack	Dalijoda	Chandikhol	Chandikhol	Block Plantation	AN32.3	60	2009-10	20	40	4.36	86	6	13.64
Cuttack	Dalijoda	Bairi	Bairi	Bald Hill Plantation	AN33.1	20	2013-14	20	38	19	86	1	41.4
Cuttack	Tamka	Kansa	Kansa (A)	ANR with gap Plantation	AN34.1	150	2014-15	21	4	6.8	85	52	38.6
Cuttack	Tamka	Kansa	Kansa (A)	ANR with gap Plantation	AN34.2	150	2014-15	21	4	4.7	85	52	43.21
Cuttack	Tamka	Kansa	Kansa (A)	ANR with gap Plantation	AN34.3	150	2014-15	21	4	10.52	85	52	38.01
Cuttack	Tamka	Kansa	Kansa (A)	ANR with gap Plantation	AN34.4	150	2014-15	21	4	5.05	85	52	50.17
Cuttack	Tamka	Kansa	Kansa (A)	ANR with gap Plantation	AN34.5	150	2014-15	21	4	11.39	85	52	48.6
Cuttack	Tamka	Tamka	Gobardhanpur	Avenue Plantation	AN35.1	15	2015-16	21	5	59.7	85	59	35
Athagarh	Athagarh	Tigiria	Tigiria	Block Plantation	AN36.1	79	2010-11	20	30	32.4	85	30	22.8
Athagarh	Athagarh	Tigiria	Tigiria	Block Plantation	AN36.2	79	2010-11	20	30	33.7	85	30	24.6
Athagarh	Athagarh	Tigiria	Tigiria	Block Plantation	AN36.3	79	2010-11	20	30	28.7	85	30	22.4
Athagarh	Athagarh	Tigiria	Tigiria	Block Plantation	AN36.4	79	2010-11	20	30	29.58	85	30	19.84
Athagarh	Athagarh	Tigiria	Tigiria	ANR with gap Plantation	AN37.1	100	2015-16	20	29	1.5	85	30	43.3
Athagarh	Athagarh	Tigiria	Tigiria	ANR with gap Plantation	AN37.2	100	2015-16	20	29	1.4	85	30	41.1

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Athagarh	Athagarh	Tigiria	Tigiria	ANR with gap Plantation	AN37.3	100	2015-16	20	29	0.64	85	30	38.77
Athagarh	Athagarh	Tigiria	Tigiria	ANR with gap Plantation	AN37.4	100	2015-16	20	28	59.45	85	30	41.45
Athagarh	Narsinghpur East	Devabhuin	Devabhuin	SSO Bamboo	AN38.1	100	2013-14	20	34	4.6	85	10	12.8
Athagarh	Narsinghpur East	Devabhuin	Devabhuin	SSO Bamboo	AN38.2	100	2013-14	20	34	0.99	85	10	13.98
Athagarh	Narsinghpur East	Devabhuin	Devabhuin	SSO Bamboo	AN38.3	100	2013-14	20	34	1.69	85	10	19.49
Athagarh	Narsinghpur East	Devabhuin	Devabhuin	SSO Bamboo	AN38.4	100	2013-14	20	33	56.51	85	10	14.71
Athagarh	Badamba	Badamba	Khalimati	ANR with gap Plantation	AN39.1	50	2014-15	20	27	43.1	85	20	27.7
Athagarh	Badamba	Badamba	Khalimati	ANR with gap Plantation	AN39.2	50	2014-15	20	27	42.5	85	20	29
Athagarh	Badamba	Gopapur	Gopapur	Block Plantation	AN40.1	20	2010-11	20	26	0.8	85	19	22
Athagarh	Narsinghpur East	Narsinghpur	Narsinghpur	Block Plantation	AN41.1	50	2009-10	20	32	0.1	85	7	21.7
Athagarh	Narsinghpur East	Narsinghpur	Narsinghpur	Block Plantation	AN41.2	50	2009-10	20	32	55.1	85	7	5.6
Athagarh	Narsinghpur East	Devabhuin	Jadapada	ANR with gap Plantation	AN42.1	100	2015-16	20	32	48	85	10	29.1
Athagarh	Narsinghpur East	Devabhuin	Jadapada	ANR with gap Plantation	AN42.2	100	2015-16	20	32	47.22	85	10	26.61
Athagarh	Narsinghpur East	Devabhuin	Jadapada	ANR with gap Plantation	AN42.3	100	2015-16	20	32	43.62	85	10	29.09
Athagarh	Narsinghpur East	Devabhuin	Jadapada	ANR with gap Plantation	AN42.4	100	2015-16	20	32	40.6	85	10	31.78

### III. Geo Tagging of Sampled out of Plantation activities under Baripada Circle

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude-Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Keonjhar WL	Anandapur	Ramchandrapur	Patilo	Bald Hill Plantation	B1.1	20	2014-15	21	7.278		86	6.281	
Keonjhar WL	Anandapur	Gayalamunda	Panasadhia	ANR with gap Plantation	B2.1	160	2014-15	21	29.188		86	2.432	
Keonjhar WL	Anandapur	Gayalamunda	Panasadhia	ANR with gap Plantation	B2.2	160	2014-15	21	29.083		86	2.427	
Keonjhar WL	Anandapur	Gayalamunda	Panasadhia	ANR with gap Plantation	B2.3	160	2014-15	21	29	24.17	86	2	27.8
Keonjhar WL	Anandapur	Gayalamunda	Panasadhia	ANR with gap Plantation	B2.4	160	2014-15	21	28	57.84	86	2	32.49
Keonjhar WL	Anandapur	Gayalamunda	Panasadhia	ANR with gap Plantation	B2.5	160	2014-15	21	29	1.8	86	2	24.57
Keonjhar WL	Anandapur	Gayalamunda	Gayalamunda	SSO Timber	B3.1	150	2014-15	21	25	21.8	86	5	56.3
Keonjhar WL	Anandapur	Gayalamunda	Gayalamunda	SSO Timber	B3.2	150	2014-15	21	25	22.08	86	5	34.08
Keonjhar WL	Anandapur	Gayalamunda	Gayalamunda	SSO Timber	B3.3	150	2014-15	21	25	24.9	86	5	33.1
Keonjhar WL	Anandapur	Gayalamunda	Gayalamunda	SSO Timber	B3.4	150	2014-15	21	25	25	86	5	32.3
Keonjhar WL	Anandapur	Gayalamunda	Gayalamunda	SSO Timber	B3.5	150	2014-15	21	25	26.1	86	5	31.5
Keonjhar WL	Bramhanipal	Bramhanipal	Bramhanipal	ANR with gap Plantation	B4.1	499.9	2015-16	21	7.055		85	55.50	
Keonjhar WL	Bramhanipal	Bramhanipal	Bramhanipal	ANR with gap Plantation	B4.2	499.9	2015-16	21	7	4	85	55	25.88
Keonjhar WL	Bramhanipal	Bramhanipal	Bramhanipal	ANR with gap Plantation	B4.3	499.9	2015-16	21	6	57.16	85	55	20.79
Keonjhar WL	Bramhanipal	Bramhanipal	Bramhanipal	ANR with gap Plantation	B4.4	499.9	2015-16	21	6	51.52	85	55	20.68
Keonjhar WL	Bramhanipal	Bramhanipal	Bramhanipal	ANR with gap Plantation	B4.5	499.9	2015-16	21	6	56.3	85	55	29.42



Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude-Degree	Latitude-Minutes	Latitude-Second	Longitude-Degree	Longitude-Minute	Longitude-Second
Keonjhar WL	Bramhanipal	Daitari	Talapada	Block Plantation	B5.1	50	2009-10	21	7.051		85	47.6	
Keonjhar WL	Bramhanipal	Daitari	Talapada	Block Plantation	B5.2	50	2009-10	21	6	59.67	85	47	31.29
Keonjhar WL	Bramhanipal	Bramhanipal	Bali Parbata	ANR with gap Plantation	B6.1	100	2014-15	21	6.953		85	53.95	
Keonjhar WL	Bramhanipal	Bramhanipal	Bali Parbata	ANR with gap Plantation	B6.2	100	2014-15	21	6	59.86	85	53	56.82
Keonjhar WL	Bramhanipal	Bramhanipal	Bali Parbata	ANR with gap Plantation	B6.3	100	2014-15	21	6	55.48	85	53	53.29
Keonjhar WL	Bramhanipal	Bramhanipal	Bali Parbata	ANR with gap Plantation	B6.4	100	2014-15	21	6	52.85	85	53	49.9
Keonjhar WL	Bramhanipal	Bramhanipal	Bali Parbata	ANR with gap Plantation	B6.5	100	2014-15	21	6	51.94	85	53	45.41
Keonjhar WL	Hadagarh	Hadagarh	Baidakhiya	Bald Hill Plantation	B7.1	20	2015-16	21	11.546		86	13.97	
Keonjhar WL	Hadagarh	Hadagarh	Sangam	ANR without Gap (AJY)	B8.1	54.5	2015-16	21	14.295		86	16.68	
Keonjhar WL	Hadagarh	Hadagarh	Sangam	ANR without Gap (AJY)	B8.2	54.5	2015-16	21	14	15.63	86	16	40.29
Keonjhar WL	Hadagarh	Hadagarh	Sangam	ANR without Gap (AJY)	B8.3	54.5	2015-16	21	14	17.65	86	16	38.12
Rairangapur	Bisoi	Bankidhi	Bankidhi	Block Plantation	B9.1	21	2009-10	22	8.924		86	18.51	
Rairangapur	Bisoi	Bankidhi	Bankidhi	Block Plantation	B10.1	7	2009-10	22	8.892		86	18.52	
Rairangapur	Badampahar	Hatabadla	Dubulabada	Block Plantation	B11.1	20	2009-10	22	9.415		86	1.945	
Rairangapur	Badampahar	Badampahar	Purunapani	Block Plantation	B12.1	10	2009-10	22	7.069		86	11.28	

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude-Degree	Latitude-Minutes	Latitude-Second	Longitude-Degree	Longitude-Minute	Longitude-Second
Rairangapur	Rairangapur	Rairangapur	Dubulabada	Block Plantation	B13.1	20	2009-10	22	17.957		86	10.07	
Rairangapur	Rairangapur	Badamtolia	Bijatola	ANR with gap Plantation	B14.1	100	2015-16	22	9.599		86	16.08	
Rairangapur	Rairangapur	Badamtolia	Bijatola	ANR with gap Plantation	B14.2	100	2015-16	22	9	34.78	86	16	3.54
Rairangapur	Rairangapur	Badamtolia	Bijatola	ANR with gap Plantation	B14.3	100	2015-16	22	9	38.04	86	16	2.68
Rairangapur	Rairangapur	Badamtolia	Bijatola	ANR with gap Plantation	B14.4	100	2015-16	22	9	40.55	86	16	4.69
Rairangapur	Rairangapur	Badamtolia	Bijatola	ANR with gap Plantation	B14.5	100	2015-16	22	9	33.12	86	15	59.07
Rairangapur	Badampahar	Suleipat	Jamjhari	ANR with gap Plantation	B15.1	200	2014-15	22	5.964		86	11.52	
Rairangapur	Badampahar	Suleipat	Jamjhari	ANR with gap Plantation	B15.2	200	2014-15	22	5	58.96	86	11	32.32
Rairangapur	Badampahar	Suleipat	Jamjhari	ANR with gap Plantation	B15.3	200	2014-15	22	5	56.95	86	11	33.65
Rairangapur	Badampahar	Suleipat	Jamjhari	ANR with gap Plantation	B15.4	200	2014-15	22	6	1.17	86	11	32.92
Rairangapur	Badampahar	Suleipat	Jamjhari	ANR with gap Plantation	B15.5	200	2014-15	22	6	0.26	86	11	37.99
Karanjia	Thakurmunda	Thakurmunda	Thakurmunda- I	ANR with gap Plantation	B16.1	150	2015-16	21	27.907		86	9.619	
Karanjia	Thakurmunda	Thakurmunda	Thakurmunda- I	ANR with gap Plantation	B16.2	150	2015-16	21	27	49.17	86	9	42.09
Karanjia	Thakurmunda	Thakurmunda	Thakurmunda- I	ANR with gap Plantation	B16.3	150	2015-16	21	27	47.04	86	9	39.58
Karanjia	Thakurmunda	Thakurmunda	Thakurmunda- I	ANR with gap Plantation	B16.4	150	2015-16	21	27	52.45	86	9	38.73

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude-Degree	Latitude-Minutes	Latitude-Second	Longitude-Degree	Longitude-Minute	Longitude-Second
Karanjia	Thakurmunda	Thakurmunda	Thakurmunda- I	ANR with gap Plantation	B16.5	150	2015-16	21	27	57.98	86	9	36.88
Karanjia	Thakurmunda	Champajhar	Ghatiadhara	SSO Timber	B17.1	68	2012-13	21	27.146		86	12.64	
Karanjia	Thakurmunda	Champajhar	Ghatiadhara	SSO Timber	B17.2	68	2012-13	21	27	11.07	86	12	39.19
Karanjia	Thakurmunda	Champajhar	Ghatiadhara	SSO Timber	B17.3	68	2012-13	21	27	7.18	86	12	40.08
Karanjia	Karanjia	Ghagarabada	Ghagarabada	Block Plantation	B18.1	15	2009-10	22	1.719		85	42.79	
Karanjia	Karanjia	Ghagarabada	Ghagarabada	ANR with gap Plantation	B19.1	50	2014-15	22	1.083		85	45.55	
Karanjia	Karanjia	Ghagarabada	Ghagarabada	ANR with gap Plantation	B19.2	50	2014-15	22	1	1.69	85	45	31.56
Karanjia	Karanjia	Singdha	Haladia	Avenue Plantation	B20.1	3	2009-10	21	53.668		85	52.93	
Karanjia	Dudhiani	Tato	Dari	ANR with gap Plantation	B21.1	100	2014-15	21	50.459		85	57.83	
Karanjia	Dudhiani	Tato	Dari	ANR with gap Plantation	B21.2	100	2014-15	21	50	30.18	85	57	51.76
Karanjia	Dudhiani	Tato	Dari	ANR with gap Plantation	B21.3	100	2014-15	21	50	29.16	85	57	48.88
Karanjia	Dudhiani	Tato	Dari	ANR with gap Plantation	B21.4	100	2014-15	21	50	25.23	85	57	53.38
Karanjia	Dudhiani	Tangabila	Tangabila	Block Plantation	B22.1	40	2009-10	21	62.259		86	0.509	
Karanjia	Dudhiani	Tangabila	Tangabila	Block Plantation	B22.2	40	2009-10						
Baripada	Deuli	Badasahi	Badasahi	ANR with gap Plantation	B23.1	50	2015-16	21	44.813		86	41.59	
Baripada	Deuli	Badasahi	Badasahi	ANR with gap Plantation	B23.2	50	2015-16	21	44	44.78	86	41	35.59



Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude-Degree	Latitude-Minutes	Latitude-Second	Longitude-Degree	Longitude-Minute	Longitude-Second
Baripada	Deuli	Deuli	Deuli	ANR with gap Plantation	B24.1	50	2014-15	22	3	4.6	86	50	37.8
Baripada	Deuli	Deuli	Deuli	ANR with gap Plantation	B24.2	50	2014-15	22	3	4.18	86	50	39.26
Baripada	Dukura	Tadaki	Dukura	ANR with gap Plantation	B25.1	100	2015-16	21	46.928		86	40.84	
Baripada	Dukura	Tadaki	Dukura	ANR with gap Plantation	B25.2	100	2015-16	21	46	54.11	86	40	54.68
Baripada	Dukura	Tadaki	Dukura	ANR with gap Plantation	B25.3	100	2015-16	21	46	59.25	86	40	47.34
Baripada	Dukura	Tadaki	Dukura	ANR with gap Plantation	B25.4	100	2015-16	21	46	53.8	86	40	47.31
Baripada	Bangriposi	Badga	Bangiriposi	Bald Hill Plantation	B26.1	10	2014-15	22	6.132		86	37.24	
Baripada	Deuli	Deuli	Kalia Soul	ANR with gap Plantation	B27.1	200	2016-17	22	0	16.03	86	54	16.18
Baripada	Deuli	Deuli	Kalia Soul	ANR with gap Plantation	B27.2	200	2016-17	22	0	11.01	86	54	15.61
Baripada	Deuli	Deuli	Kalia Soul	ANR with gap Plantation	B27.3	200	2016-17	22	0	15.8	86	54	21.15
Baripada	Deuli	Deuli	Kalia Soul	ANR with gap Plantation	B27.4	200	2016-17	22	0	19.83	86	54	25.74
Baripada	Deuli	Deuli	Kalia Soul	ANR with gap Plantation	B27.5	200	2016-17	22	0	19.18	86	54	20.34
Baripada	Bangriposi	Sirsa	Sirsa	Block Plantation	B28.1	60	2009-10	22	15.419		86	36.07	
Baripada	Bangriposi	Sirsa	Sirsa	Block Plantation	B28.2	60	2009-10	22	15	22.41	86	32	2.24
Baripada	Bangriposi	Sirsa	Sirsa	Block Plantation	B28.3	60	2009-10	22	15	22.3	86	35	58.95

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude-Degree	Latitude-Minutes	Latitude-Second	Longitude-Degree	Longitude-Minute	Longitude-Second
Baripada	Deuli	Suliapada	Baghada	Block Plantation	B29.1	20	2009-10	22	1.373		86	58.67	
Balasore	Nilgiri	Sajanagada	Matiali	ANR without Gap (AJY)	B30.1	53	2014-15	21	31.451		86	40.95	
Balasore	Nilgiri	Sajanagada	Matiali	ANR without Gap (AJY)	B30.2	53	2014-15	21	31	25.55	86	40	58.96
Balasore	Jaleswar	Bardia	Sukhjodi	Block Plantation	B31.1	7.5	2009-10	21	54.932		87	6.926	
Balasore	Nilgiri	Mitrapur	Mitrapur	Avenue Plantation	B33.1	10	2010-11	21	52.463		87	10.30	
Balasore	Nilgiri	Mitrapur	Mitrapur	Avenue Plantation	B33.2	10	2010-11	21	30.13		86	51.13	
Balasore	Nilgiri	Sajanagada	Matiali	Block Plantation	B34.1	30	2009-10	21	34	15.25	86	40	3.15
Balasore	Nilgiri	Sajanagada	Matiali	Block Plantation	B34.2	30	2009-10	21	34.273		86	40.04	
Balasore	Kuldiha	Panchaligeswar	Panchaligeswar	Block Plantation	B35.1	10	2009-10	21	25	43.23	86	44	14.01
Balasore	Kuldiha	Jharaghati	Chenchada	Block Plantation	B36.1	10	2009-10	21	25.724		86	44.24	
Balasore	Kuldiha	Kuldiha	Kuldiha	SSO Timber	B37.1	200	2010-11	21	25.231		86	31.839	
Balasore	Kuldiha	Kuldiha	Kuldiha	SSO Timber	B37.2	200	2010-11	21	25	8.33	86	31	48.14
Balasore	Kuldiha	Kuldiha	Kuldiha	SSO Timber	B37.3	200	2010-11	21	25	21.49	86	31	51.49
Balasore	Kuldiha	Kuldiha	Kuldiha	SSO Timber	B37.4	200	2010-11	21	25	19.07	86	31	45.42
Balasore	Kuldiha	Kuldiha	Kuldiha	SSO Timber	B37.5	200	2010-11	21	25	5.06	86	31	52.24

#### IV. Geo Tagging of Sampled out of Plantation activities under Bhubaneswar Circle

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Khordha	Khordha	Khordha	GadaKhordha	Avenue Plantation	BH1.1	2	2014-15	20	10	48	85	39	38
Khordha	Khordha	Khordha	GadaKhordha	Avenue Plantation	BH1.2	2	2014-15	20	10	45.67	85	39	39.65
Khordha	Tangi	Tangi	Tangi	ANR with gap Plantation	BH2.1	12	2015-16	19	55	47.57	85	23	42.5
Khordha	Ranpur	Sankhajodi	Sirikuti	SSO Bamboo	BH3.1	200	2015-16	19	58	7	85	14	53
Khordha	Ranpur	Sankhajodi	Sirikuti	SSO Bamboo	BH3.2	200	2015-16	19	58	7.12	85	14	56.88
Khordha	Ranpur	Sankhajodi	Sirikuti	SSO Bamboo	BH3.3	200	2015-16	19	58	5.4	85	14	54.32
Khordha	Ranpur	Sankhajodi	Sirikuti	SSO Bamboo	BH3.4	200	2015-16	19	58	3.81	85	14	55.09
Khordha	Ranpur	Sankhajodi	Sirikuti	SSO Bamboo	BH3.5	200	2015-16	19	58	1.37	85	14	53.78
Khordha	Khordha	Bologarh	Patabandha	ANR with gap Plantation	BH4.1	100	2015-16	20	12	61	85	18	15
Khordha	Khordha	Bologarh	Patabandha	ANR with gap Plantation	BH4.2	100	2015-16	20	13	2.73	85	18	12.04
Khordha	Khordha	Bologarh	Patabandha	ANR with gap Plantation	BH4.3	100	2015-16	20	13	2.47	85	18	5.1
Khordha	Khordha	Bologarh	Patabandha	ANR with gap Plantation	BH4.4	100	2015-16	20	12	59.66	85	18	1.78
Khordha	Ranpur	Korodapala	Bhetabara	SSO Timber	BH5.1	584	2014-15	20	0	19	85	16	7
Khordha	Ranpur	Korodapala	Bhetabara	SSO Timber	BH5.2	584	2014-15	20	0	16	85	16	9
Khordha	Ranpur	Korodapala	Bhetabara	SSO Timber	BH5.3	584	2014-15	20	0	15.04	85	16	4.4
Khordha	Ranpur	Korodapala	Bhetabara	SSO Timber	BH5.4	584	2014-15	20	0	11.78	85	16	8.76
Khordha	Ranpur	Korodapala	Bhetabara	SSO Timber	BH5.5	584	2014-15	20	0	9.83	85	16	6.11
Khordha	Tangi	Bhusandapur	Nalsingh	Bald Hill Plantation	BH6.1	20	2015-16	20	0	10	85	28	20



Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Chandaka	Bhubaneswar	Bharatpur	Bharatpur	Block Plantation	BH8.1	50	2009-10	20	17	24	85	47	17
Chandaka	Bhubaneswar	Bharatpur	Bharatpur	Block Plantation	BH8.2	50	2009-10	20	17	29.21	85	47	14.17
Chandaka	Bhubaneswar	Bharatpur	Bharatpur	Urban plantation fruit bearing	BH9.1	2	2016-17	20	18	32	85	48	26
City Forest	Cuttack	Salipur	Chitrotola	CA PCA Block Plantation	BH10.1	2.161	2011-12	19	20	21	55	86	13
City Forest	Mancheswar	Rasulgarh	Rasulgarh	Avenue Plantation	BH11.1	9	2015-16	19	20	18	26	85	52
Chilika WL	Rambha	Pitisial	Nandala	ANR with gap Plantation	BH12.1	200	2016-17	19	28	42.18	85	10	59.88
Chilika WL	Rambha	Pitisial	Nandala	ANR with gap Plantation	BH12.2	200	2016-17	19	28	44.96	85	11	4.11
Chilika WL	Rambha	Pitisial	Nandala	ANR with gap Plantation	BH12.3	200	2016-17	19	28	45.13	85	11	7.21
Chilika WL	Rambha	Pitisial	Nandala	ANR with gap Plantation	BH12.4	200	2016-17	19	28	41.63	85	11	4.4
Chilika WL	Rambha	Pitisial	Nandala	ANR with gap Plantation	BH12.5	200	2016-17	19	28	50.52	85	11	14.68
Chilika WL	Tangi	Saran	Sunakhala	Block Plantation	BH13.1	10	2009-10	19	49	16.06	85	17	5.31
Puri	Gop	Nimapada	Haripur	Avenue Plantation	BH14.1	12	2013-14	20	6	32	85	52	36
Puri	Konark	Konark	Chandrabhaga	Block Plantation	BH15.1	10	2009-10	19	52	34	86	7	6
Puri	Balukhand	Satyabadi	Satyabadi	Avenue Plantation	BH16.1	7	2014-15	19	52	33	85	48	56

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Puri	Balukhand	Balighai	Bangar	Block Plantation	BH17.1	45	2009-10	19	50	36	85	59	8
Puri	Balukhand	Balighai	Bangar	Block Plantation	BH17.2	45	2009-10	19	50	32.3	85	59	9.77
Puri	Gop	Gop	Gop	Avenue Plantation	BH18.1	2	2010-11	19	57	47	86	0	26
Puri	Konark	Ramchandi	Kapileswar	Block Plantation	BH19.1	10	2009-10	19	51	46	86	2	32
Puri	Konark	Konark	Konark	Block Plantation	BH20.1	10	2009-10	19	52	0	86	5	30
Nayagarh	Mahipur	Mahipur	Banuasahi	ANR with gap Plantation	BH21.1	110	2014-15	20	8	6.8	85	0	52.4
Nayagarh	Mahipur	Mahipur	Banuasahi	ANR with gap Plantation	BH21.2	110	2014-15	20	8	5.1	85	0	50
Nayagarh	Mahipur	Mahipur	Banuasahi	ANR with gap Plantation	BH21.3	110	2014-15	20	8	3.3	85	0	51.4
Nayagarh	Mahipur	Mahipur	Banuasahi	ANR with gap Plantation	BH21.4	110	2014-15	20	8	10.23	85	0	46.39
Nayagarh	Mahipur	Mahitoma	Kosalanga	Block Plantation	BH22.1	50	2009-10	20	16	42.7	85	0	47.9
Nayagarh	Mahipur	Mahitoma	Kosalanga	Block Plantation	BH22.2	50	2009-10	20	16	44.4	85	0	47.5
Nayagarh	Odagaon	Bahadajholla	Bahadajholla	Block Plantation	BH23.1	90	2009-10	20	5	19.7	84	55	45.5
Nayagarh	Odagaon	Bahadajholla	Bahadajholla	Block Plantation	BH23.2	90	2009-10	20	5	19.6	84	53	41.6
Nayagarh	Odagaon	Bahadajholla	Bahadajholla	Block Plantation	BH23.3	90	2009-10	20	5	20.3	84	53	45.4
Nayagarh	Odagaon	Bahadajholla	Bahadajholla	Block Plantation	BH23.4	90	2009-10	20	5	21.3	84	53	48.2

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Nayagarh	Odagaon	Bahadajholla	Bahadajholla	ANR with gap Plantation	BH24.1	50	2014-15	20	3	39	84	53	24
Nayagarh	Odagaon	Bahadajholla	Bahadajholla	ANR with gap Plantation	BH24.2	50	2014-15	20	3	40.9	84	53	27.9
Nayagarh	Odagaon	Odagaon	Odagaon	SSO Bamboo	BH25.1	360	2015-16	19	57	59.7	84	57	52
Nayagarh	Odagaon	Odagaon	Odagaon	SSO Bamboo	BH25.2	360	2015-16	19	58	3.26	84	57	59.64
Nayagarh	Odagaon	Odagaon	Odagaon	SSO Bamboo	BH25.3	360	2015-16	19	58	0.57	84	57	42.83
Nayagarh	Odagaon	Odagaon	Odagaon	SSO Bamboo	BH25.4	360	2015-16	19	58	9.33	84	58	2.23
Nayagarh	Odagaon	Odagaon	Odagaon	SSO Bamboo	BH25.5	360	2015-16	19	58	10.08	84	58	12.66
Nayagarh	Khandapada	Bhapur	Marada	Bald Hill Plantation	BH26.1	20	2015-16	20	19	44	85	13	53.6
Nayagarh	Khandapada	Singapada	Nuapalli	SSO Bamboo	BH27.1	365	2014-15	20	17	2.1	85	3	21.7
Nayagarh	Khandapada	Singapada	Nuapalli	SSO Bamboo	BH27.2	365	2014-15	20	17	0.4	85	3	22
Nayagarh	Khandapada	Singapada	Nuapalli	SSO Bamboo	BH27.3	365	2014-15	20	17	0.95	85	3	29.63
Nayagarh	Khandapada	Singapada	Nuapalli	SSO Bamboo	BH27.4	365	2014-15	20	17	1.08	85	3	14.2
Nayagarh	Khandapada	Singapada	Nuapalli	SSO Bamboo	BH27.5	365	2014-15	20	17	0.13	85	3	7.68
Rajnagar WL	Mahakalpada	Batighara	Kansaridiha	CA- PCA (Mangrove)	BH28.1	2	2013-14	20	21	3.9	86	44	7.44
Rajnagar WL	Mahakalpada	Batighara	Kansaridiha	CA- PCA (Mangrove)	BH29.1	174.056	2013-14	20	20.539		86	43.81	
Rajnagar WL	Rajnagar	Satavaia	Satavaia	Mangrove Plantation	BH30.1	100	2010-11	20	37	4.77	86	53	24.17



## V. Geo Tagging of Sampled out of Plantation activities under Bhawanipatna Circle

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Khariar	Khariar	Karlakote	Karlakote	Bald Hill Plantation	KL 1.1	7.00	2016-17	20	19	3.29	82	40	1.67
Khariar	Khariar	Ranimunda	Ranimunda	AJY Block plantation	KL 2.1	10.00	2016-17	20	10	50.48	82	46	6.92
Khariar	Komna	Komna	Pandelvelly	Bald Hill Plantation	KL3.1	5.00	2016-17	20	27	827	82	39	2.3
Khariar	Komna	Komna	Kamkeda	ANR with gap Plantation	KL4.1	200.00	2015-16	20	32	31	82	41	9.95
Khariar	Komna	Komna	Kamkeda	ANR with gap Plantation	KL4.2	200.00	2015-16	20	32	34	82	41	9.9
Khariar	Komna	Komna	Kamkeda	ANR with gap Plantation	KL4.3	200.00	2015-16	20	32	34	82	41	9.93
Khariar	Komna	Komna	Kamkeda	ANR with gap Plantation	KL4.4	200.00	2015-16	20	32	32	82	41	9.89
Khariar	Komna	Komna	Kamkeda	ANR with gap Plantation	KL4.5	200.00	2015-16	20	32	36.28	82	41	17.65
Khariar	Komna	Rajana	Jharnanamal	Block Plantation	KL5.1	40.00	2010-11	20	25	8.7	82	36	3.38
Khariar	Komna	Rajana	Jharnanamal	Block Plantation	KL5.1	40.00	2011-12	20	25	3.92	82	36	2.17
Khariar	Komna	Rajana	Kamkeda	SSO Bamboo	KL6.1	259.33	2015-16	20	34	4.06	82	41	5.73
Khariar	Komna	Rajana	Kamkeda	SSO Bamboo	KL6.2	259.33	2015-16	20	34	4.05	82	41	5.68
Khariar	Komna	Rajana	Kamkeda	SSO Bamboo	KL6.3	259.33	2015-16	20	34	3.65	82	41	5.9
Khariar	Komna	Rajana	Kamkeda	SSO Bamboo	KL6.4	259.33	2015-16	20	34	3.96	82	41	6.57
Khariar	Komna	Rajana	Kamkeda	SSO Bamboo	KL6.5	259.33	2015-16	20	34	5.33	82	41	6.9
Khariar	Nuapada	Lakhna	Anlajuba	Bald Hill Plantation	KL7.1	5.00	2016-17	20	48	9.23	82	40	1.61
Khariar	Nuapada	Lakhna	Lakhna	ANR with gap Plantation	KL8.1	100.00	2016-17	20	42	2.08	82	39	94

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Khariar	Nuapada	Lakhna	Lakhna	ANR with gap Plantation	KL8.2	100.00	2016-17	20	42	1.3	82	38	9.97
Khariar	Nuapada	Lakhna	Lakhna	ANR with gap Plantation	KL8.3	100.00	2016-17	20	42	1.37	82	38	9.82
Khariar	Nuapada	Lakhna	Lakhna	ANR with gap Plantation	KL8.4	100.00	2016-17	20	42	1.35	82	38	9.67
Sonepur	Sonapur	Sonapur	Arunapur	OWP	KL9.1	15.00	2015-16	20	51	9.67	83	51	3.09
Sonepur	Sonapur	Sonapur	Sonapur	Bald Hill Plantation	KL9.2	15.00	2016-17	20	50	4.57	83	53	1.55
Sonepur	Biramaharajpur	Durdura	Durdura	ANR with gap Plantation	KL10.1	100.00	2016-17	20	54	9.05	84	13	3.19
Sonepur	Biramaharajpur	Durdura	Durdura	ANR with gap Plantation	KL10.2	100.00	2016-17	20	54	9.61	84	13	3.08
Sonepur	Biramaharajpur	Durdura	Durdura	ANR with gap Plantation	KL10.3	100.00	2016-17	20	55	1.07	84	13	3.02
Sonepur	Biramaharajpur	Durdura	Durdura	ANR with gap Plantation	KL10.4	100.00	2016-17	20	55	1.18	84	13	2.27
Sonepur	Biramaharajpur	Subalaya	Chandili	Bald Hill Plantation	KL11.1	15.00	2016-17	20	54	5.01	84	7	8.53
Sonepur	Ulunda	Ulunda	Dhodhala	ANR with gap Plantation	KL12.1	50.00	2016-17	20	57	2.35	83	51	7.54
Sonepur	Ulunda	Ulunda	Dhodhala	ANR with gap Plantation	KL12.2	50.00	2016-17	20	57	1.64	83	51	5.61
Sonepur	Ulunda	Siindhol	B.Padarapalli	ANR with gap Plantation	KL13.1	140.00	2015-16	21	6	9.81	83	53	9.2
Sonepur	Ulunda	Siindhol	B.Padarapalli	ANR with gap Plantation	KL13.2	140.00	2015-16	21	7	24	83	53	9.71
Sonepur	Ulunda	Siindhol	B.Padarapalli	ANR with gap Plantation	KL13.3	140.00	2015-16	21	7	63	83	53	9.92
Sonepur	Ulunda	Siindhol	B.Padarapalli	ANR with gap Plantation	KL13.4	140.00	2015-16	21	7	1.04	83	54	25

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Sonepur	Ulunda	Siindhol	B.Padarapalli	ANR with gap Plantation	KL13.5	140.00	2015-16	21	7	1.58	83	54	45
Sonepur	Ulunda	Siindhol	Padarpalli	SSO Bamboo	KL14.1	200.00	2015-16	21	8	6.54	83	54	73
Sonepur	Ulunda	Siindhol	Padarpalli	SSO Bamboo	KL14.2	200.00	2015-16	21	8	7.4	83	54	1.93
Sonepur	Ulunda	Siindhol	Padarpalli	SSO Bamboo	KL14.3	200.00	2015-16	21	8	6.29	83	54	2.17
Sonepur	Ulunda	Siindhol	Padarpalli	SSO Bamboo	KL14.4	200.00	2015-16	21	8	6.04	83	54	3.1
Sonepur	Ulunda	Siindhol	Padarpalli	SSO Bamboo	KL14.5	200.00	2015-16	21	8	6.28	83	54	3.17
Sunabeda Wildlife	Sunabeda	Sunenga	Jalmudi	Fruit Bearing Plantation	KL15.1	5.00	2016-17	20	31	7.84	82	28	3.04
Kalahandi South	Th. Rampur(N)	Saisurni	Saisurni	ANR with gap Plantation	KL16.1	200.00	2016-17	19	35	10.65	83	9	19.86
Kalahandi South	Th. Rampur(N)	Saisurni	Saisurni	ANR with gap Plantation	KL16.2	200.00	2015-16	19	35	11.07	83	9	17.39
Kalahandi South	Th. Rampur(N)	Saisurni	Saisurni	ANR with gap Plantation	KL16.3	200.00	2015-16	19	35	19.8	83	9	24.01
Kalahandi South	Th. Rampur(N)	Saisurni	Saisurni	ANR with gap Plantation	KL16.4	200.00	2015-16	19	35	18.41	83	9	34.39
Kalahandi South	Th. Rampur(N)	Saisurni	Saisurni	ANR with gap Plantation	KL16.5	200.00	2015-16	19	35	19.35	83	9	14.06
Kalahandi South	Th. Rampur(S)	Th. Rampur(S)	Ranipadar	ANR with gap Plantation	KL17.1	40.00	2014-15	19	30	29.98	82	57	25
Kalahandi South	Th. Rampur(S)	Th. Rampur(S)	Ranipadar	ANR with gap Plantation	KL17.2	40.00	2014-15	19	30	31.08	82	57	23.73
Kalahandi South	Jaipatna	Benakhamar	Mahulpatna	Bald Hill Plantation	KL18.1	30.00	2016-17	19	27	42.62	82	54	43.61
Kalahandi South	Jaipatna	Benakhamar	Mahulpatna	Bald Hill Plantation	KL18.2	30.00	2016-17	19	27	44.13	82	54	43.95
Kalahandi South	Jaipatna	Uchhala	Kukud	ANR with gap Plantation	KL19.1	100.00	2016-17	19	28	31.31	82	41	3.04



Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Kalahandi South	Jaipatna	Uchhala	Kukud	ANR with gap Plantation	KL19.2	100.00	2016-17	19	28	37.76	82	41	3.45
Kalahandi South	Jaipatna	Uchhala	Kukud	ANR with gap Plantation	KL19.3	100.00	2016-17	19	28	25.34	82	41	4.36
Kalahandi South	Jaipatna	Uchhala	Kukud	ANR with gap Plantation	KL19.4	100.00	2016-17	19	28	20.3	82	41	5.32
Kalahandi South	Jaipatna	Uchhala	Kukud	ANR with gap Plantation	KL19.5	100.00	2016-17	19	28	50.52	82	41	12.97
Kalahandi South	Jaipatna	Jaipatna	Mukhiguda	Avenue Plantation	KL20.1	25 RKM	2009-10	19	27	3.56	82	51	6.06
Kalahandi South	Jaipatna	Jaipatna	Mukhiguda	Avenue Plantation	KL20.2	25 RKM	2009-10	19	27	21.21	82	50	55.47
Kalahandi South	Jaipatna	Jaipatna	Mukhiguda	Management of Old Teak	KL21.1	20.00	2012-13	19	27	44.85	82	50	44.35
Kalahandi South	Biswanathpur	Bhimraipur	Dhepaguda	Block Plantation	KL24.1	5.00	2009-10	19	51	46.09	83	23	31.42
Kalahandi North	Kegaon	Golamunda	Bakrasil	Bald Hill Plantation	KL25.1	15.00	2011-12	19	54	9.74	82	42	48.06
Kalahandi North	Kegaon	Kirkakani	Kirkakani	Bald Hill Plantation	KL26.1	10.00	2016-17	19	58	20	82	45	42
Kalahandi North	Kegaon	Kegaon	Nuagaon	SSO Bamboo	KL27.1	1137.55	2016-17	20	3	59.36	82	55	45.3
Kalahandi North	Kegaon	Kegaon	Nuagaon	SSO Bamboo	KL27.2	1137.55	2016-17	20	3	58.5	82	55	42.97
Kalahandi North	Kegaon	Kegaon	Nuagaon	SSO Bamboo	KL27.3	1137.55	2016-17	20	4	1.54	82	55	43.28
Kalahandi North	Kegaon	Kegaon	Nuagaon	SSO Bamboo	KL27.4	1137.55	2016-17	20	3	57.85	85	55	47.19
Kalahandi North	Kegaon	Kegaon	Nuagaon	SSO Bamboo	KL27.5	1137.55	2016-17	20	3	56.76	82	55	45.2

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Kalahandi North	Kesinga	Rupra Road	Dampadar	ANR with gap Plantation	KL30.1	86.80	2014-15	20	13	30.82	83	20	18.52
Kalahandi North	Kesinga	Rupra Road	Dampadar	ANR with gap Plantation	KL30.2	86.80	2014-15	20	13	19.26	83	20	23.94
Kalahandi North	Kesinga	Rupra Road	Dampadar	ANR with gap Plantation	KL30.3	86.80	2014-15	20	13	38.49	83	20	4.55
Kalahandi North	Kesinga	Rupra Road	Dampadar	ANR with gap Plantation	KL30.4	86.80	2014-15	20	12	58.32	83	20	23.33
Kalahandi North	Kesinga	Kasurpada	Singjharan	ANR with gap Plantation	KL31.1	150.00	2015-16	20	13	43.69	83	19	13.47
Kalahandi North	Kesinga	Kasurpada	Singjharan	ANR with gap Plantation	KL31.2	150.00	2015-16	20	13	46.76	83	19	12.4
Kalahandi North	Kesinga	Kasurpada	Singjharan	ANR with gap Plantation	KL31.3	150.00	2015-16	20	13	40.32	83	19	12.52
Kalahandi North	Kesinga	Kasurpada	Singjharan	ANR with gap Plantation	KL31.4	150.00	2015-16	20	13	37.21	83	19	9.44
Kalahandi North	Kesinga	Kasurpada	Singjharan	ANR with gap Plantation	KL31.5	150.00	2015-16	20	13	43.77	83	19	8.33
Balangir	Harisankar	Khaprakhol	Khaprakhol	ANR with gap Plantation	KL32.1	100.00	2015-16	20	44	50.7	82	50	43.59
Balangir	Harisankar	Khaprakhol	Khaprakhol	ANR with gap Plantation	KL32.2	100.00	2015-16	20	44	47.13	82	50	42.82
Balangir	Harisankar	Khaprakhol	Khaprakhol	ANR with gap Plantation	KL32.3	100.00	2015-16	20	44	52.52	82	50	42.41
Balangir	Harisankar	Khaprakhol	Khaprakhol	ANR with gap Plantation	KL32.4	100.00	2015-16	20	44	48.75	82	50	42.9
Balangir	Harisankar	Khaprakhol	Khaprakhol	ANR with gap Plantation	KL32.5	100.00	2015-16	20	44	45.93	82	50	40.07
Balangir	Harisankar	Dhanamunda	Ankamura	Block Plantation	KL33.1	90.00	2009-10	20	51	19.78	82	58	1.57

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	APO Year	Latitude -Degree	Latitude -Minutes	Latitude -Second	Longitude -Degree	Longitude -Minute	Longitude -Second
Balangir	Harisankar	Dhanamunda	Ankamura	Block Plantation	KL33.2	90.00	2009-10	20	51	19.81	82	87	59.58
Balangir	Harisankar	Dhanamunda	Ankamura	Block Plantation	KL33.3	90.00	2009-10	20	51	17.51	82	57	58.58
Balangir	Harisankar	Dhanamunda	Ankamura	Block Plantation	KL33.4	90.00	2009-10	20	51	19.04	82	57	4
Balangir	Patnagarh	Patnagarh	Goelmara	ANR with gap Plantation	KL34.1	70.00	2014-15	20	37	4.49	83	9	32.51
Balangir	Patnagarh	Patnagarh	Goelmara	ANR with gap Plantation	KL34.2	70.00	2014-15	20	37	0.13	83	9	33.01
Balangir	Patnagarh	Patnagarh	Goelmara	ANR with gap Plantation	KL34.3	70.00	2014-15	20	37	7.06	83	9	33.08
Balangir	Patnagarh	Patnagarh	Paruabhadi	Block Plantation	KL35.1	60.00	2009-10	20	36	33.09	83	11	12.27
Balangir	Patnagarh	Patnagarh	Paruabhadi	Block Plantation	KL35.2	60.00	2009-10	20	36	31.37	83	11	11.76
Balangir	Patnagarh	Patnagarh	Paruabhadi	Block Plantation	KL35.3	60.00	2009-10	20	36	32.52	83	11	9.9
Balangir	Patnagarh	Bandhapada	Deisebd	ANR with gap Plantation	KL36.1	70.00	2014-15	20	33	36	83	11	18
Balangir	Patnagarh	Bandhapada	Deisebd	ANR with gap Plantation	KL36.2	70.00	2014-15	20	33	34.79	83	11	12.65
Balangir	Patnagarh	Bandhapada	Deisebd	ANR with gap Plantation	KL36.3	70.00	2014-15	20	33	40.21	83	11	14.02
Balangir	Balangir	Balangir-I	Gadhrel	ANR with gap Plantation	KL37.1	40.00	2015-16	20	41	19.21	83	25	59.87
Balangir	Balangir	Balangir-I	Gadhrel	ANR with gap Plantation	KL37.2	40.00	2015-16	20	41	17.09	83	25	57.27
Balangir	Balangir	Balangir-II	Khaliakani	ANR with gap Plantation	KL38.1	50.00	2015-16	20	8	31.9	83	26	30.6



## VI. Geo Tagging of Sampled out of Plantation activities under Rourkela Circle

Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Deogarh	Reiamal	Rengalibeda	Budhideo	Management of Old Teak	RKL1.1	2016-17	30	21	22	53.46	84	40	2.47
Deogarh	Reiamal	Rengalibeda	Budhideo	Management of Old Teak	RKL1.2	2016-17	30	21	22	57.95	84	40	2.35
Deogarh	Reiamal	Rengalibeda	Gundeipali	ANR with gap Plantation	RKL2.1	2013-14	20	21	26	49.71	84	44	10.58
Deogarh	Reiamal	Chadheimara	Sunaposi	CA-Block Plantation	RKL3.1	2016-17	35	21	11	41.82	84	46	38.07
Deogarh	Reiamal	Chadheimara	Sunaposi	CA-Block Plantation	RKL3.2	2016-17	35	21	11	41.6	84	46	37.9
Deogarh	Barkot	Kalla	Sarankot	ANR with gap Plantation	RKL4.1	2015-16	100	21	30	60	85	5	37.47
Deogarh	Barkot	Kalla	Sarankot	ANR with gap Plantation	RKL4.2	2015-16	100	21	30	56.77	85	5	38.66
Deogarh	Barkot	Kalla	Sarankot	ANR with gap Plantation	RKL4.3	2015-16	100	21	30	4.99	85	5	32.28
Deogarh	Barkot	Kalla	Sarankot	ANR with gap Plantation	RKL4.4	2015-16	100	21	30	8.59	85	5	29.445
Deogarh	Barkot	Kalla	Sarankot	ANR with gap Plantation	RKL4.5	2015-16	100	21	30	51.4	85	5	45.53
Deogarh	Barkot	Thianal	Thianal	SSO Bamboo	RKL5.1	2015-16	2000	21	29	48.68	85	6	42.84
Deogarh	Barkot	Dantaribahal	Kankarada	SSO Bamboo	RKL5.2	2016-17	2000	21	29	47.24	85	6	40.2
Deogarh	Barkot	Dantaribahal	Kankarada	SSO Bamboo	RKL5.3	2016-17	2000	21	29	43.35	85	6	37.95
Deogarh	Barkot	Dantaribahal	Kankarada	SSO Bamboo	RKL5.4	2016-17	2000	21	29	50.45	85	6	43.41
Deogarh	Barkot	Dantaribahal	Kankarada	SSO Bamboo	RKL5.5	2016-17	2000	21	29	46.91	85	6	43.97
Deogarh	Barkot	Dantaribahal	Kurkunda	ANR without Gap (AJY)	RKL6.1	2016-17	54	21	34	33.71	84	52	23.15
Deogarh	Barkot	Dantaribahal	Kurkunda	ANR without Gap (AJY)	RKL6.2	2016-17	54	21	34	31.65	84	52	22.27

Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Deogarh	Pallahara	Pallahara	Batisuan	ANR with gap Plantation	RKL7.1	2016-17	100	21	23	0.86	85	10	33.54
Deogarh	Pallahara	Pallahara	Batisuan	ANR with gap Plantation	RKL7.2	2016-17	100	21	23	0.42	85	10	30.82
Deogarh	Pallahara	Pallahara	Batisuan	ANR with gap Plantation	RKL7.3	2016-17	100	21	22	57.87	85	10	33.6
Deogarh	Pallahara	Pallahara	Batisuan	ANR with gap Plantation	RKL7.4	2016-17	100	21	22	57.43	85	10	26.89
Deogarh	Pallahara	Jamardiha	Nagira	Block Plantation	RKL8.1	2015-16	130	21	33	37.5	85	17	37.94
Deogarh	Pallahara	Jamardiha	Nagira	Block Plantation	RKL8.2	2015-16	130	21	33	45.09	85	17	56.51
Deogarh	Pallahara	Jamardiha	Nagira	Block Plantation	RKL8.3	2015-16	130	21	33	43.77	85	17	57.88
Deogarh	Pallahara	Jamardiha	Nagira	Block Plantation	RKL8.4	2015-16	130	21	33	43.22	85	17	52.81
Deogarh	Pallahara	Jamardiha	Nagira	Block Plantation	RKL8.5	2015-16	130	21	33	49.09	85	17	58.66
Keonjhar	BJP	Suakati	Suakati	ANR with gap Plantation	RKL9.1	2015-16	150	21	36	46.93	85	28	37.19
Keonjhar	BJP	Suakati	Suakati	ANR with gap Plantation	RKL9.2	2015-16	150	21	36	48.19	85	28	33
Keonjhar	BJP	Suakati	Suakati	ANR with gap Plantation	RKL9.3	2015-16	150	21	36	45.37	85	28	33
Keonjhar	BJP	Suakati	Suakati	ANR with gap Plantation	RKL9.4	2015-16	150	21	36	41.21	85	28	32.81
Keonjhar	BJP	Suakati	Suakati	ANR with gap Plantation	RKL9.5	2015-16	150	21	36	35.38	85	28	32.11
Keonjhar	BJP	Suakati	Suakati	ANR without Gap (AJY)	RKL10.1	2015-16	50	21	35	12.169	85	35	4.1
Keonjhar	BJP	Suakati	Suakati	ANR without Gap (AJY)	RKL10.2	2015-16	50	21	35	12.73	85	35	3.93
Keonjhar	Champua	Champua	Champua	Block Plantation	RKL11.1	2013-14	30	22	0	0.31	85	41	30.88
Keonjhar	Champua	Champua	Champua	Block Plantation	RKL11.2	2013-14	30	22	0	1.26	85	41	33.2

Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Keonjhar	Champua	Champua	Champua	Bald Hill Plantation	RKL12.1	2016-17	20	21	59	13.32	85	39	4.47
Keonjhar	Champua	Bamebari	Dabuna	CA-Safety Zone Plantation	RKL13.1	2013-14	1.66	21	52	28.95	85	23	50.73
Keonjhar	Ghatagaon	Ghatagaon	Ghatagaon	ANR with gap Plantation	RKL14.1	2013-14	250	21	22	40.97	85	52	3.22
Keonjhar	Ghatagaon	Ghatagaon	Ghatagaon	ANR with gap Plantation	RKL14.2	2013-14	250	21	22	42.95	85	52	2.88
Keonjhar	Ghatagaon	Ghatagaon	Ghatagaon	ANR with gap Plantation	RKL14.3	2013-14	250	21	22	39.09	85	52	2.2
Keonjhar	Ghatagaon	Ghatagaon	Ghatagaon	ANR with gap Plantation	RKL14.4	2013-14	250	21	22	42.1	85	52	1.27
Keonjhar	Ghatagaon	Ghatagaon	Ghatagaon	ANR with gap Plantation	RKL14.5	2013-14	250	21	22	42.48	85	52	0.25
Keonjhar	Ghatagaon	Ghatagaon	Ghatagaon	ANR with gap Plantation	RKL15.1	2015-16	300	21	22	56.26	85	52	38.96
Keonjhar	Ghatagaon	Ghatagaon	Ghatagaon	ANR with gap Plantation	RKL15.2	2015-16	300	21	22	48.51	85	52	38.21
Keonjhar	Ghatagaon	Ghatagaon	Ghatagaon	ANR with gap Plantation	RKL15.3	2015-16	300	21	22	55.13	85	52	38.65
Keonjhar	Ghatagaon	Ghatagaon	Ghatagaon	ANR with gap Plantation	RKL15.4	2015-16	300	21	22	53.37	85	52	40.4
Keonjhar	Ghatagaon	Ghatagaon	Ghatagaon	ANR with gap Plantation	RKL15.5	2015-16	300	21	22	47.44	85	52	38.6
Keonjhar	Ghatagaon	Dhenkikote	Dhenkikote	ANR with gap Plantation	RKL16.1	2015-16	9.21	21	27	0.54	85	50	58.2
Keonjhar	Ghatagaon	Dhenkikot	Dhenkikot	CA Block Plantation	RKL17.1	2016-17	8.15	21	27	43.9	85	51	24.66
Bonei	Tamda	Bhaludunguri	Bartengla	PCA -ANR with gap Plantation	RKL18.1	2016-17	89	21	52	0.22	84	48	26



Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Bonei	Tamda	Bhaludunguri	Bartengla	PCA -ANR with gap Plantation	RKL18.2	2016-17	89	21	52	5.58	84	48	26.44
Bonei	Tamda	Bhaludunguri	Bartengla	PCA -ANR with gap Plantation	RKL18.3	2016-17	89	21	52	9	84	48	29.53
Bonei	Tamda	Bhaludunguri	Bartengla	PCA -ANR with gap Plantation	RKL18.4	2016-17	89	21	52	12.68	84	48	30.35
Bonei	Tamda	Gurundia	Kantapali	SSO Bamboo	RKL19.1	2016-17	500	21	58	49.2	84	33	59.21
Bonei	Tamda	Gurundia	Kantapali	SSO Bamboo	RKL19.2	2016-17	500	21	55	37.97	84	45	58.55
Bonei	Tamda	Gurundia	Kantapali	SSO Bamboo	RKL19.3	2016-17	500	21	55	37.46	84	45	56.84
Bonei	Tamda	Gurundia	Kantapali	SSO Bamboo	RKL19.4	2016-17	500	21	55	39.39	84	45	59.48
Bonei	Tamda	Gurundia	Kantapali	SSO Bamboo	RKL19.5	2016-17	500	21	55	36.92	84	45	53.92
Bonei	Tamda	Bhaludunguri	Bhaludunguri	ANR without Gap (AJY)	RKL20.1	2016-17	50	21	49	50.06	84	50	40.58
Bonei	Tamda	Bhaludunguri	Bhaludunguri	ANR without Gap (AJY)	RKL20.2	2016-17	50	21	49	53.88	84	50	38.95
Bonei	Sole	Mahuldihi	Sirgida	ANR with gap Plantation	RKL21.1	2016-17	50	22	2	3.52	84	37	25.82
Bonei	Sole	Mahuldihi	Sirgida	ANR with gap Plantation	RKL21.2	2016-17	50	22	1	58.01	84	37	52.44
Bonei	Sole	Saliguda	Sole	Bamboo plantation	RKL22.1	2014-15	150	21	58	49.2	84	33	59.21
Bonei	Sole	Saliguda	Sole	Bamboo plantation	RKL22.2	2014-15	150	21	58	50.54	84	33	59.99
Bonei	Sole	Saliguda	Sole	Bamboo plantation	RKL22.3	2014-15	150	21	58	51.97	84	33	57.55
Bonei	Sole	Saliguda	Sole	Bamboo plantation	RKL22.4	2014-15	150	21	58	50.37	84	33	56.19
Bonei	Sole	Saliguda	Sole	Bamboo plantation	RKL22.5	2014-15	150	21	58	56.89	84	33	57.18

Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Bonei	Bonei	Banei	Badposh	Management of Old Teak	RKL23.1	2013-14	99.3	21	45	20.64	84	59	12.96
Bonei	Bonei	Banei	Badposh	Management of Old Teak	RKL23.2	2013-14	99.3	21	45	26.89	84	59	7.57
Bonei	Bonei	Banei	Badposh	Management of Old Teak	RKL23.3	2013-14	99.3	21	45	28.93	84	59	9.17
Bonei	Bonei	Banei	Badposh	Management of Old Teak	RKL23.4	2013-14	99.3	21	45	32.89	84	59	7.78
Bonei	Bonei	Banei	Badposh	Management of Old Teak	RKL23.5	2013-14	99.3	21	45	24.84	84	59	12.77
Bonei	Bonei	Tikayatpali	Khajuribahal	ANR with gap Plantation	RKL24.1	2014-15	100	21	40	36.63	84	53	44.14
Bonei	Bonei	Tikayatpali	Khajuribahal	ANR with gap Plantation	RKL24.2	2014-15	100	21	40	39.01	84	53	49.22
Bonei	Bonei	Tikayatpali	Khajuribahal	ANR with gap Plantation	RKL24.3	2014-15	100	21	40	37.03	84	53	50.66
Bonei	Bonei	Tikayatpali	Khajuribahal	ANR with gap Plantation	RKL24.4	2014-15	100	21	40	34.52	84	53	46.1
Bonei	Bonei	Dhamendragadi	Kinjirikela	Block Plantation	RKL25.1	2013-14	192	21	48	1.34	84	55	32.81
Bonei	Bonei	Dhamendragadi	Kinjirikela	Block Plantation	RKL25.2	2013-14	192	21	48	4.77	84	55	30.37
Bonei	Bonei	Dhamendragadi	Kinjirikela	Block Plantation	RKL25.3	2013-14	192	21	48	8.08	84	55	32
Bonei	Bonei	Dhamendragadi	Kinjirikela	Block Plantation	RKL25.4	2013-14	192	21	48	3.34	84	55	29.6
Bonei	Bonei	Dhamendragadi	Kinjirikela	Block Plantation	RKL25.5	2013-14	192	21	48	12.47	84	55	29.5
Rourkela	Bishra	Khirtola	Khirtola	ANR with gap Plantation	RKL26.1	2015-16	150	22	18	56.72	84	59	46.47
Rourkela	Bishra	Khirtola	Khirtola	ANR with gap Plantation	RKL26.2	2015-16	150	22	19	4.15	84	59	44.94
Rourkela	Bishra	Khirtola	Khirtola	ANR with gap Plantation	RKL26.3	2015-16	150	22	19	1.94	84	59	42.5

Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Rourkela	Bishra	Khirtola	Khirtola	ANR with gap Plantation	RKL26.4	2015-16	150	22	19	8.55	84	59	44.11
Rourkela	Bishra	Khirtola	Khirtola	ANR with gap Plantation	RKL26.5	2015-16	150	22	19	14.39	84	59	44.44
Rourkela	Bishra	Birikera	SanRamlei	Block Plantation	RKL27.1	2010-11	13.5	22	13	25.62	84	58	8.23
Rourkela	Bishra	Bishra	Mahipani	AJY Block plantation	RKL28.1	2016-17	10	22	17	4.92	85	3	40.53
Rourkela	Kunarmunda	BadDalki	Birda	ANR with gap Plantation	RKL29.1	2014-15	200	22	5	11.79	84	42	48.63
Rourkela	Kunarmunda	BadDalki	Birda	ANR with gap Plantation	RKL29.2	2014-15	200	22	5	14.96	84	42	47.72
Rourkela	Kunarmunda	BadDalki	Birda	ANR with gap Plantation	RKL29.3	2014-15	200	22	5	12.41	84	42	46.7
Rourkela	Kunarmunda	BadDalki	Birda	ANR with gap Plantation	RKL29.4	2014-15	200	22	5	15.77	84	42	46.9
Rourkela	Kunarmunda	BadDalki	Birda	ANR with gap Plantation	RKL29.5	2014-15	200	22	5	10.98	84	42	47.58
Rourkela	Kunarmunda	Kunarmunda	Kunarmunda	Bald Hill Plantation	RKL30.1	2015-16	30	22	17	50.82	84	55	55.8
Rourkela	Kunarmunda	Kunarmunda	Kunarmunda	Bald Hill Plantation	RKL30.2	2015-16	30	22	17	51.31	84	55	54.2
Rourkela	Kunarmunda	Kunarmunda	Ushra	Block Plantation(MWS)	RKL31.1	2011-12	50	22	15	53.5	84	42	48.95
Rourkela	Kunarmunda	Kunarmunda	Ushra	Block Plantation(MWS)	RKL31.2	2011-12	50	22	15	53.47	84	42	51.25
Rourkela	Banki	Banki	Banki	CA-Block Plantation	RKL32.1	2010-11	9.33	22	5	27.08	84	54	13.57
Rourkela	Banki	Banki	Chandrapur	SSO Bamboo	RKL33.1	2016-17	562.062	22	2	5.62	84	52	56.6
Rourkela	Banki	Banki	Chandrapur	SSO Bamboo	RKL33.2	2016-17	562.062	22	2	4.16	84	52	55.31
Rourkela	Banki	Banki	Chandrapur	SSO Bamboo	RKL33.3	2016-17	562.062	22	2	5.11	84	52	56.13



Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Rourkela	Banki	Banki	Chandrapur	SSO Bamboo	RKL33.4	2016-17	562.062	22	2	2.17	84	52	54.51
Rourkela	Banki	Banki	Chandrapur	SSO Bamboo	RKL33.5	2016-17	562.062	22	2	6.29	84	52	57.7
Sundargarh	Hemgiri	Kanika	Kanika	Management of Old Teak	RKL34.1	2012-13	10	21	53	32.62	83	44	29.29
Sundargarh	Hemgiri	Daghora	Daghora	ANR with gap Plantation	RKL35.1	2014-15	100	21	50	55.62	83	39	36.84
Sundargarh	Hemgiri	Daghora	Daghora	ANR with gap Plantation	RKL35.2	2014-15	100	21	50	52.99	83	39	37.83
Sundargarh	Hemgiri	Daghora	Daghora	ANR with gap Plantation	RKL35.3	2014-15	100	21	50	57.32	83	39	33.16
Sundargarh	Hemgiri	Daghora	Daghora	ANR with gap Plantation	RKL35.4	2014-15	100	21	50	52.81	83	39	31.63
Sundargarh	Hemgiri	Daghora	Daghora	ANR with gap Plantation	RKL35.5	2014-15	100	21	50	49.74	83	39	36.96
Sundargarh	Hemgiri	Hemgiri	Ostali	SSO Bamboo	RKL36.1	2016-17	1401.46	21	58	37.02	83	43	55.94
Sundargarh	Hemgiri	Hemgiri	Ostali	SSO Bamboo	RKL36.2	2016-17	1401.46	21	58	46.66	83	43	38.01
Sundargarh	Hemgiri	Hemgiri	Ostali	SSO Bamboo	RKL36.3	2016-17	1401.46	21	58	47.74	83	43	39
Sundargarh	Hemgiri	Hemgiri	Ostali	SSO Bamboo	RKL36.4	2016-17	1401.46	21	58	39.19	83	43	54.84
Sundargarh	Hemgiri	Hemgiri	Ostali	SSO Bamboo	RKL36.5	2016-17	1401.46	21	58	37.65	83	43	51.78
Sundargarh	Gopalpur	Gopalpur	Tikinipada	ANR with gap Plantation	RKL37.1	2014-15	150	22	2	54.98	83	45	7.41
Sundargarh	Gopalpur	Gopalpur	Tikinipada	ANR with gap Plantation	RKL37.2	2014-15	150	22	2	54.36	83	45	16.46
Sundargarh	Gopalpur	Gopalpur	Tikinipada	ANR with gap Plantation	RKL37.3	2014-15	150	22	2	54.06	83	45	10.94
Sundargarh	Gopalpur	Gopalpur	Tikinipada	ANR with gap Plantation	RKL37.4	2014-15	150	22	2	56.95	83	45	10.81
Sundargarh	Gopalpur	Gopalpur	Tikinipada	ANR with gap Plantation	RKL37.5	2014-15	150	22	2	53.43	83	45	15.11

Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Sundargarh	Gopalpur	Tihuria	Jamkani	ANR with gap Plantation	RKL38.1	2015-16	300	22	6	47.07	83	36	2.65
Sundargarh	Gopalpur	Tihuria	Jamkani	ANR with gap Plantation	RKL38.2	2015-16	300	22	6	53.75	83	36	10.77
Sundargarh	Gopalpur	Tihuria	Jamkani	ANR with gap Plantation	RKL38.3	2015-16	300	22	6	50.03	83	36	11.23
Sundargarh	Gopalpur	Tihuria	Jamkani	ANR with gap Plantation	RKL38.4	2015-16	300	22	6	48.39	83	36	8.13
Sundargarh	Gopalpur	Tihuria	Jamkani	ANR with gap Plantation	RKL38.5	2015-16	300	22	6	52.48	83	36	6.31
Sundargarh	Ujalpur	Kindrikela	Kinjirikela	CA ANR with Gap plantation	RKL39.1	2014-15	300	22	16	39.22	83	54	25.73
Sundargarh	Ujalpur	Kindrikela	Kinjirikela	CA ANR with Gap plantation	RKL39.2	2014-15	300	22	16	20.3	85	54	32.03
Sundargarh	Ujalpur	Kindrikela	Kinjirikela	CA ANR with Gap plantation	RKL39.3	2014-15	300	22	15	35.78	85	55	12.24
Sundargarh	Ujalpur	Kindrikela	Kinjirikela	CA ANR with Gap plantation	RKL39.4	2014-15	300	22	15	36.42	85	55	9.96
Sundargarh	Ujalpur	Kindrikela	Kinjirikela	CA ANR with Gap plantation	RKL39.5	2014-15	300	22	15	33.67	85	55	11.56
Sundargarh	Ujalpur	Ujalpur	Tashladihi	Bald Hill Plantation	RKL40.1	2011-12	23	22	7	7.13	83	58	18.73

## VII. Geo Tagging of Sampled out of Plantation activities under Sambalpur Circle

Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Jharsuguda	Brajarajnagar	Brajarajnagar	Ulap	Block Plantation	S1	2010-11	95	21	51	40.46	83	49	16.76
Jharsuguda	Brajarajnagar	Brajarajnagar	Ulap	Block Plantation	S1	2010-11	95	21	51	44.7	83	49	17.79
Jharsuguda	Brajarajnagar	Brajarajnagar	Ulap	Block Plantation	S1	2010-11	95	21	51	44	83	49	19.1
Jharsuguda	Brajarajnagar	Brajarajnagar	Ulap	Block Plantation	S1	2010-11	95	21	51	43.21	83	49	23.52
Jharsuguda	Brajarajnagar	Banbahal	Banbahal	CA PCA Block Plantation	S2	2016-17	32.79	21	45	56.48	83	52	3.05
Jharsuguda	Belpahar	Belpahar	Tingismal	CA PCA Block Plantation	S3	2015-16	6.9	21	47	5.67	83	49	39.39
Jharsuguda	Jharsuguda	Jharsuguda	Patrapali	Block Plantation	S4	2009-10	80	21	45	25.13	83	57	51.57
Jharsuguda	Jharsuguda	Jharsuguda	Patrapali	Block Plantation	S4	2009-10	80	21	45	26.46	83	57	50.24
Jharsuguda	Jharsuguda	Jharsuguda	Patrapali	Block Plantation	S4	2009-10	80	21	46	23.05	83	57	12.96
Jharsuguda	Jharsuguda	Jharsuguda	Patrapali	Block Plantation	S4	2009-10	80	21	46	19.84	83	57	14.8
Jharsuguda	Jharsuguda	Jharsuguda	Patrapali	ANR with gap Plantation	S5	2016-17	300	21	46	24.41	82	57	9.05
Jharsuguda	Jharsuguda	Jharsuguda	Patrapali	ANR with gap Plantation	S5	2016-17	300	21	46	24.61	83	57	0.46
Jharsuguda	Jharsuguda	Jharsuguda	Patrapali	ANR with gap Plantation	S5	2016-17	300	21	46	23.06	83	57	1.83
Jharsuguda	Jharsuguda	Jharsuguda	Patrapali	ANR with gap Plantation	S5	2016-17	300	21	46	21.51	83	57	3.31
Jharsuguda	Jharsuguda	Jharsuguda	Patrapali	ANR with gap Plantation	S5	2016-17	300	21	46	17.49	83	57	4.74
Jharsuguda	Belpahar	Bagmunda	Tangarpali	SSO Bamboo	S6	2016-17	200	21	40	31.49	83	47	9.43
Jharsuguda	Belpahar	Bagmunda	Tangarpali	SSO Bamboo	S6	2016-17	200	21	40	25.81	83	47	4.27
Jharsuguda	Belpahar	Bagmunda	Tangarpali	SSO Bamboo	S6	2016-17	200	21	40	22.55	83	47	7.75
Jharsuguda	Belpahar	Bagmunda	Tangarpali	SSO Bamboo	S6	2016-17	200	21	40	20.51	83	46	59.5
Jharsuguda	Belpahar	Bagmunda	Tangarpali	SSO Bamboo	S6	2016-17	200	21	40	16	83	46	53.17



Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Jharsuguda	Belpahar	Kamdandihi	Jhargaon-A	ANR with gap Plantation	S7	2014-15	100	21	47	50.87	83	41	14.5
Jharsuguda	Belpahar	Kamdandihi	Jhargaon-A	ANR with gap Plantation	S7	2014-15	100	21	47	53.21	83	41	13.78
Jharsuguda	Belpahar	Kamdandihi	Jhargaon-A	ANR with gap Plantation	S7	2014-15	100	21	47	59.16	83	41	14.39
Jharsuguda	Belpahar	Kamdandihi	Jhargaon-A	ANR with gap Plantation	S7	2014-15	100	21	47	51.68	83	41	22.73
Sambalpur	Rengali	Rengali	Tuthikatarbgn	Block Plantation	S8	2010-11	100	21	41	12.5	84	0	14.14
Sambalpur	Rengali	Rengali	Tuthikatarbgn	Block Plantation	S8	2010-11	100	21	41	9.99	84	0	10.9
Sambalpur	Rengali	Rengali	Tuthikatarbgn	Block Plantation	S8	2010-11	100	21	41	15.81	84	0	11.07
Sambalpur	Rengali	Rengali	Tuthikatarbgn	Block Plantation	S8	2010-11	100	21	41	16.52	84	0	3.04
Sambalpur	Rengali	Bhalubahal	Pardesipali	ANR with gap Plantation	S9	2015-16	45	21	36	34.14	84	4	52.93
Sambalpur	Rengali	Bhalubahal	Pardesipali	ANR with gap Plantation	S9	2015-16	45	21	36	30.97	84	4	51.53
Rairakhol	Badbahal			Corridor Fodder Plantation	S15	2016-17	20	20	57	36.64	84	16	34.19
Rairakhol	Badmal	Mochibahal	Saiberni	ANR with gap Plantation	S16	2016-17	250	21	8	35.45	84	7	33.7
Rairakhol	Badmal	Mochibahal	Saiberni	ANR with gap Plantation	S16	2016-17	250	21	8	40.7	84	7	37.03
Rairakhol	Badmal	Mochibahal	Saiberni	ANR with gap Plantation	S16	2016-17	250	21	8	46.88	4	7	39.05
Rairakhol	Badmal	Mochibahal	Saiberni	ANR with gap Plantation	S16	2016-17	250	21	8	49.82	4	7	41.1
Rairakhol	Badmal	Badmal	Badmal	CA PCA Block Plantation	S17	2015-16	32	21	7	5.62	84	7	34
Rairakhol	Badmal	Badmal	Badmal	CA PCA Block Plantation	S17	2015-16	32	21	7	4.66	84	7	35.53

Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Rairakhol	Naktideul	Janjori	Chadchadi	ANR with gap Plantation	S18	2016-17	300	21	10	2.38	84	43	47.37
Rairakhol	Naktideul	Janjori	Chadchadi	ANR with gap Plantation	S18	2016-17	300	21	10	1.2	84	43	50.94
Rairakhol	Naktideul	Janjori	Chadchadi	ANR with gap Plantation	S18	2016-17	300	21	9	59.68	84	43	51.59
Rairakhol	Naktideul	Janjori	Chadchadi	ANR with gap Plantation	S18	2016-17	300	21	9	58.09	84	43	47.42
Rairakhol	Naktideul	Janjori	Chadchadi	ANR with gap Plantation	S18	2016-17	300	21	9	54.59	84	43	45.86
Rairakhol	Rairakhol	Daincha	Terabada	SSO timber	S19	2014-15	60	21	6	1.11	84	23	30.47
Rairakhol	Rairakhol	Daincha	Terabada	SSO timber	S19	2014-15	60	21	6	4.69	84	23	28.05
Rairakhol	Rairakhol	Daincha	Terabada	SSO timber	S19	2014-15	60	21	6	3.22	84	23	40.97
Rairakhol	Rairakhol	Daincha	Terabada	SSO Bamboo	S20	2016-17	60	21	7	1.24	84	25	44.51
Rairakhol	Rairakhol	Daincha	Terabada	SSO Bamboo	S20	2016-17	60	21	7	4.78	84	25	46.79
Rairakhol	Rairakhol	Daincha	Terabada	SSO Bamboo	S20	2016-17	60	21	7	7.54	84	25	50
Rairakhol	Rairakhol	Luhapank	Luhapank	Block Plantation	S21	2009-10	55	21	4	13.87	84	26	6.01
Rairakhol	Rairakhol	Luhapank	Luhapank	Block Plantation	S21	2009-10	55	21	4	12.06	84	26	0.43
Rairakhol	Rairakhol	Luhapank	Luhapank	Block Plantation	S21	2009-10	55	21	2	56.76	84	26	51.73
Rairakhol	Rairakhol	Rairakhol	Rairakhol	Bamboo Plantation	S22	2014-15	300	21	6	34.57	84	19	5.94
Rairakhol	Rairakhol	Rairakhol	Rairakhol	Bamboo Plantation	S22	2014-15	300	21	6	31.84	84	19	4.09
Rairakhol	Rairakhol	Rairakhol	Rairakhol	Bamboo Plantation	S22	2014-15	300	21	6	40.28	84	19	5.69
Rairakhol	Rairakhol	Rairakhol	Rairakhol	Bamboo Plantation	S22	2014-15	300	21	6	27.94	84	19	6.53
Rairakhol	Rairakhol	Rairakhol	Rairakhol	Bamboo Plantation	S22	2014-15	300	21	6	32.69	84	18	53.88
Bargarh	Paikamal	Jharbandh	Jharbandh	ANR with gap Plantation	S23	2015-16	50	21	4	13.31	82	46	48.94
Bargarh	Paikamal	Jharbandh	Jharbandh	ANR with gap Plantation	S23	2015-16	50	21	4	10.33	82	46	50.68

Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Bargarh	Paikamal	Jharbandh	Jharbandh	ANR with gap Plantation	S24	2014-15	50	21	8	6.51	82	48	45.87
Bargarh	Paikamal	Jharbandh	Jharbandh	ANR with gap Plantation	S24	2014-15	50	21	8	0.62	82	48	44.49
Bargarh	Ghens	Melchamunda	Barpadar	Block Plantation	S25	2009-10	110	21	6	37.17	83	13	26.99
Bargarh	Ghens	Melchamunda	Barpadar	Block Plantation	S25	2009-10	110	21	6	35.5	83	13	25.17
Bargarh	Ghens	Melchamunda	Barpadar	Block Plantation	S25	2009-10	110	21	6	38.15	83	13	23.94
Bargarh	Ghens	Melchamunda	Barpadar	Block Plantation	S25	2009-10	110	21	6	40.64	83	13	24.21
Bargarh	Ghens	Melchamunda	Barpadar	Block Plantation	S25	2009-10	110	21	6	38.32	83	13	20.95
Bargarh	Ghens	Sohela	Sargunapali	ANR with gap Plantation	S26	2016-17	200	21	14	35	83	13	42.63
Bargarh	Ghens	Sohela	Sargunapali	ANR with gap Plantation	S26	2016-17	200	21	14	31.14	83	13	44.36
Bargarh	Ghens	Sohela	Sargunapali	ANR with gap Plantation	S26	2016-17	200	21	14	25.3	83	13	48.22
Bargarh	Ghens	Sohela	Sargunapali	ANR with gap Plantation	S26	2016-17	200	21	14	23.4	83	13	41.8
Bargarh	Ghens	Sohela	Sargunapali	ANR with gap Plantation	S26	2016-17	200	21	14	41.93	83	13	44.63
Bargarh	Ghens	Bijepur	Bijepur	CA PCA Block Plantation	S27	2016-17	20	21	12	34	83	23	58.22
Bamra WL	Kuchinda WL	Kusumi WL	Laidagada WL	Block Plantation	S31	2009-10	30	84	26	43.88	21	46	20.88
Bamra WL	Kuchinda WL	Kusumi WL	Laidagada WL	Block Plantation	S31	2009-10	30	84	26	59.32	21	46	9.6
Bamra WL	Kuchinda WL	Kusumi WL	Laidagada WL	Block Plantation	S32	2009-10	20	21	44	4.21	84	26	48.91
Bamra WL	Jamankira WL	Bhojpur WL	Sirid WL	SSO Bamboo	S33	2016-17	575.505	21	37	58.34	84	26	43.7
Bamra WL	Jamankira WL	Bhojpur WL	Sirid WL	SSO Bamboo	S33	2016-17	575.505	21	37	55.22	84	26	42.5



Division	Range	Section	Beat	Type of Assets	No of Plot	APO Year	Area of the site (Ha)	Latitude			Longitude		
								Degree	Minute	Second	Degree	Minute	Second
Bamra WL	Jamankira WL	Bhojpur WL	Sirid WL	SSO Bamboo	S33	2016-17	575.505	21	37	53.09	84	26	38.36
Bamra WL	Jamankira WL	Bhojpur WL	Sirid WL	SSO Bamboo	S33	2016-17	575.505	21	37	56.74	84	26	47.79
Bamra WL	Jamankira WL	Bhojpur WL	Sirid WL	SSO Bamboo	S33	2016-17	575.505	21	37	51.33	84	26	46.15
Bamra WL	Bamra WL	Gadposh WL	Sagra WL	Block Plantation	S34	2009-10	100	22	10	19.83	84	28	35.57
Bamra WL	Bamra WL	Gadposh WL	Sagra WL	Block Plantation	S34	2009-10	100	22	10	18.47	84	28	37.78
Bamra WL	Bamra WL	Gadposh WL	Sagra WL	Block Plantation	S34	2009-10	100	22	10	16.07	84	28	32.91
Bamra WL	Bamra WL	Gadposh WL	Sagra WL	Block Plantation	S34	2009-10	100	22	10	14.73	84	28	36.98
Bamra WL	Bamra WL	Gadposh WL	Kinabaga	Corridor Fodder Plantation	S35	2016-17	10	22	6	24.94	84	28	9.38
Bamra WL	Bamra WL	Kholilung WL	Goeljhump WL	Block Plantation	S36	2009-10	100	22	0	20.04	84	27	30.2
Bamra WL	Bamra WL	Kholilung WL	Goeljhump WL	Block Plantation	S36	2009-10	100	22	0	24.98	84	27	29.34
Bamra WL	Bamra WL	Kholilung WL	Goeljhump WL	Block Plantation	S36	2009-10	100	22	0	29.71	84	27	31.86
Bamra WL	Bamra WL	Kholilung WL	Goeljhump WL	Block Plantation	S36	2009-10	100	22	0	17.3	84	27	37.48
Bamra WL	Bamra WL	Gadposh WL	Sargad WL	ANR without Gap	S37	2011-12	72.145	21	44	4.21	84	26	48.91
Bamra WL	Bamra WL	Gadposh WL	Sargad WL	ANR without Gap	S37	2011-12	72.145	21	44	2.81	84	26	28.79
Bamra WL	Bamra WL	Gadposh WL	Sargad WL	ANR without Gap	S37	2011-12	72.145	21	44	0.86	84	26	30.62
Bamra WL	Kuchinda WL	Kusumi WL	Laidagada WL	ANR without Gap (AJY)	S38	2016-17	50	21	45	14.98	84	27	20.48
Bamra WL	Kuchinda WL	Kusumi WL	Laidagada WL	ANR without Gap (AJY)	S38	2016-17	50	21	45	12.02	84	27	23.87

## VIII. Geo Tagging of Sampled out of Planation activities under Koraput Circle

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	Latitude			Longitude		
							Degree	Minute	Second	Degree	Minute	Second
Koraput	Koraput	Koraput	Mangra	Bald Hill Plantation	K1	20	18	50	28.5	82	42	10.548
Koraput	Simliguda	Simliguda	Pitaguda	Block Plantation	K2	25	18	38	56.7	82	45	18.78
Koraput	Simliguda	Nandapur	Nandapur	ANR with gap Plantation	K3	117	18	32	52.59	82	45	9.2
Koraput	Simliguda	Nandapur	Nandapur	ANR with gap Plantation	K3	117	18	32	51.73	82	45	9.02
Koraput	Simliguda	Nandapur	Nandapur	ANR with gap Plantation	K3	117	18	32	50.94	82	45	8.66
Koraput	Simliguda	Nandapur	Nandapur	ANR with gap Plantation	K3	117	18	32	49.6	82	45	8.67
Koraput	Simliguda	Nandapur	Nandapur	ANR with gap Plantation	K3	117	18	32	53.48	82	45	11.24
Koraput	Simliguda	Simliguda	Kunduli	Bald Hill Plantation	K4	25	18	35	42.24	82	52	35.94
Koraput	Koraput	Podagada	Janiguda	Block Plantation	K5	35	18	49	10.42	82	52	51.62
Koraput	Koraput	Podagada	Janiguda	Block Plantation	K5	35	18	49	11.13	82	52	47.74
Koraput	Koraput	Podagada	Janiguda	ANR with gap Plantation	K6	50	18	50	31.88	82	48	4.39
Koraput	Koraput	Podagada	Janiguda	ANR with gap Plantation	K6	50	18	50	30.77	82	48	6.28
Koraput	Koraput	Podagada	Janiguda	ANR with gap Plantation	K6	50	18	50	27.9	82	48	5.06
Koraput	Balda	Padhua	Undrgoda	ANR with gap Plantation	K7	40	18	15	51.12	82	37	21.72
Koraput	Balda	Padhua	Undrgoda	ANR with gap Plantation	K7	40	18	15	49.72	82	37	18.05
Koraput	Balda	Padhua	Undrgoda	ANR with gap Plantation	K7	40	18	15	42.97	82	37	15.16
Koraput	Balda	Padhua	Darliput	ANR without Gap (AJY)	K8	50	18	30	56.1	82	32	49.92
Koraput	Balda	Padhua	Darliput	ANR without Gap (AJY)	K8	50	18	30	55.43	82	32	48.01
Koraput	Balda	Padhua	Darliput	ANR without Gap (AJY)	K8	50	18	30	54	82	32	51.41
Nabarangapur	Dabugam	Dabugam	Koilari	Block Plantation	K9	100	19	27	52.18	82	19	43.48
Nabarangapur	Dabugam	Dabugam	Koilari	Block Plantation	K9	100	19	27	59.37	82	19	36.83
Nabarangapur	Dabugam	Dabugam	Koilari	Block Plantation	K9	100	19	27	55.42	82	19	39.33
Nabarangapur	Dabugam	Dabugam	Koilari	Block Plantation	K9	100	19	27	57.65	82	19	46.81
Nabarangapur	Dabugam	Dabugam	Koilari	Block Plantation	K9	100	19	27	55.68	82	19	43.81
Nabarangapur	Dabugam	Dabugam	Sulia	Block Plantation	K10	20	19	28	25.5	82	22	6.84
Nabarangapur	Dabugam	Dabugam	Sulia	ANR with gap Plantation	K11	50	19	28	48.86	82	22	13.22

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	Latitude			Longitude		
							Degree	Minute	Second	Degree	Minute	Second
Nabarangapur	Dabugam	Dabugam	Sulia	ANR with gap Plantation	K11	50	19	28	46.65	82	22	14.2
Nabarangapur	Dabugam	Dabugam	Sulia	ANR with gap Plantation	K11	50	19	28	47.16	82	22	16.65
Nabarangapur	Nabarangapur	Tumbarla	Tumbarla	Block Plantation	K12	35	19	22	27.8	82	33	5.13
Nabarangapur	Nabarangapur	Tumbarla	Tumbarla	Block Plantation	K12	35	19	22	46.4637	82	33	9.163
Nabarangapur	Nabarangapur	Nabarangapur	Nabarangapur	ANR with gap Plantation	K13	40	19	14	57.56	82	30	46.1
Nabarangapur	Nabarangapur	Nabarangapur	Nabarangapur	ANR with gap Plantation	K13	40	19	14	54.96	82	30	44.02
Nabarangapur	Nabarangapur	Papadahandi	Tonguda	ANR with gap Plantation	K14	40	19	19	2.88	82	30	15.12
Nabarangapur	Nabarangapur	Papadahandi	Tonguda	ANR with gap Plantation	K14	40	19	19	6.18	82	30	14.52
Nabarangapur	Umarkote	Dhora	Karagoan	Block Plantation	K15	30	19	33	34.02	82	12	3.24
Nabarangapur	Umarkote	Dhora	Karagoan	Block Plantation	K15	30	19	33	35.01	82	12	0.12
Nabarangapur	Umarkote	Singisari	Godkhunta	ANR without Gap (AJY)	K16	50	19	29	15.24	82	14	33.9
Nabarangapur	Umarkote	Singisari	Godkhunta	ANR without Gap (AJY)	K16	50	19	29	17.98	82	14	30.16
Nabarangapur	Umarkote	Singisari	Godkhunta	ANR without Gap (AJY)	K16	50	19	29	17.16	82	14	32.23
Jeypore	Baipariguda	Dashmantpur	Dashmantpur	Block Plantation	K17	30	18	39	46.8	82	26	36
Jeypore	Baipariguda	Dashmantpur	Dashmantpur	Block Plantation	K17	30	18	39	43.88	82	26	35.32
Jeypore	Jeypore	Balhigaam	Chereka	SSO Bamboo	K18	1504	18	52	39.72	82	17	30.66
Jeypore	Jeypore	Balhigaam	Chereka	SSO Bamboo	K18	1504	18	52	38.79	82	17	29.38
Jeypore	Jeypore	Balhigaam	Chereka	SSO Bamboo	K18	1504	18	52	37.66	82	17	29.76
Jeypore	Jeypore	Balhigaam	Chereka	SSO Bamboo	K18	1504	18	52	38.34	82	17	30.94
Jeypore	Baipariguda	Balhigaam	Chereka	SSO Bamboo	K18	1504	18	52	41.2	82	17	29.67
Jeypore	Baipariguda	Matpada	Doroguda	ANR with gap Plantation	K19	50	18	45	27.39	82	20	45.6
Jeypore	Baipariguda	Matpada	Doroguda	ANR with gap Plantation	K19	50	18	45	37.59	82	20	42.44
Jeypore	Baipariguda	Matpada	Doroguda	ANR with gap Plantation	K19	50	18	45	39.01	82	20	50.35
Jeypore	Jeypore	Patraput	Patraput	ANR with gap Plantation	K20	20	18	47	28.2	82	31	56.64
Jeypore	Bariguma	Bariguma	Bariguma	ANR without Gap (AJY)	K21	50	19	2	25.95	82	31	53.37
Jeypore	Bariguma	Bariguma	Bariguma	ANR without Gap (AJY)	K21	50	19	2	24.66	82	31	53.55
Jeypore	Bariguma	Bariguma	Bariguma	ANR without Gap (AJY)	K21	50	19	2	24.75	82	31	57.03



Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	Latitude			Longitude		
							Degree	Minute	Second	Degree	Minute	Second
Jeypore	Boriguma	Katharagada	Katharagada	Bald Hill Plantation	K22	10	19	6	46.26	82	45	6.84
Jeypore	Boriguma	Katharagada	Katharagada	ANR with gap Plantation	K23	50	19	6	15.48	82	45	1.02
Jeypore	Boriguma	Katharagada	Katharagada	ANR with gap Plantation	K23	50	19	6	13.33	82	45	59.89
Jeypore	Boriguma	Katharagada	Katharagada	ANR with gap Plantation	K23	50	19	6	17.64	82	45	58.34
Malkangiri	Mathili	Mathili	Godiali	ANR with gap Plantation	K24	50	18	34	45.54	82	13	20.58
Malkangiri	Mathili	Mathili	Godiali	ANR with gap Plantation	K24	50	18	34	48.12	82	13	20.39
Malkangiri	Mathili	Mathili	Godiali	ANR with gap Plantation	K24	50	18	34	47.71	82	13	27.29
Malkangiri	Mathili	Mathili	Chedinga	ANR with gap Plantation	K25	20	18	33	47.16	82	7	47.4
Malkangiri	Mathili	Pangam	Pangam	ANR with gap Plantation	K26	100	18	31	18.96	82	6	48.36
Malkangiri	Mathili	Pangam	Pangam	ANR with gap Plantation	K26	100	18	31	16.75	82	6	50.64
Malkangiri	Mathili	Pangam	Pangam	ANR with gap Plantation	K26	100	18	31	12.87	82	6	49.74
Malkangiri	Mathili	Pangam	Pangam	ANR with gap Plantation	K26	100	18	31	11.77	82	6	46.93
Malkangiri	Mathili	Pangam	Pangam	ANR with gap Plantation	K26	100	18	31	16.07	82	6	53.04
Malkangiri	Balimela	Balimela	Nilakamberu	Block Plantation	K27	25	18	47	27.36	82	31	56.52
Malkangiri	Balimela	Somnathpur	Somnathpur	SSO Bamboo	K28	280	18	18	17.04	82	6	23.1
Malkangiri	Balimela	Somnathpur	Somnathpur	SSO Bamboo	K28	280	18	18	20.89	82	6	22.2
Malkangiri	Balimela	Somnathpur	Somnathpur	SSO Bamboo	K28	280	18	18	21.46	82	6	18.86
Malkangiri	Balimela	Somnathpur	Somnathpur	SSO Bamboo	K28	280	18	18	17.12	82	6	19.08
Malkangiri	Balimela	Somnathpur	Somnathpur	SSO Bamboo	K28	280	18	18	14.6	82	6	18.15
Malkangiri	Malkangiri	Malkangiri	Champakhari	ANR without Gap (AJY)	K30	52	18	23	41.82	81	55	40.32
Malkangiri	Malkangiri	Malkangiri	Champakhari	ANR without Gap (AJY)	K30	52	18	23	39.53	81	55	38.05
Malkangiri	Malkangiri	Malkangiri	Champakhari	ANR without Gap (AJY)	K30	52	18	23	41.49	81	55	34.68
Malkangiri	Malkangiri	Podamgiri	Akur	Block Plantation	K31	25	18	33	13.14	81	55	24
Rayagada	Rayagada	Nathma	Nathma	Bald Hill Plantation	K32	10	19	9	12.6	83	21	36.54
Rayagada	Gunpur	Gunpur	Gatal padar	Block Plantation	K33	10	19	0	42.78	83	44	21.36
Rayagada	Muniguda	Dangasoroda		SSO timber	K35	334	19	38	59.46	83	39	9.78
Rayagada	Muniguda	Dangasoroda		SSO timber	K35	334	19	38	56.61	83	39	8.96

Division	Range	Section	Beat	Type of Assets	No of Plot	Area of the site (Ha)	Latitude			Longitude		
							Degree	Minute	Second	Degree	Minute	Second
Rayagada	Muniguda	Dangasoroda		SSO timber	K35	334	19	38	59.22	83	39	14.23
Rayagada	Muniguda	Dangasoroda		SSO timber	K35	334	19	38	52.47	83	39	11.48
Rayagada	Muniguda	Dangasoroda		SSO timber	K35	334	19	38	53.57	83	39	4.91
Rayagada	Muniguda	Kuntabadi	Salema	SSO Bamboo	K36	441	19	43	56.61	83	35	57.54
Rayagada	Muniguda	Kuntabadi	Salema	SSO Bamboo	K36	441	19	43	59.26	83	35	56.88
Rayagada	Muniguda	Kuntabadi	Salema	SSO Bamboo	K36	441	19	44	2.2	83	35	58.72
Rayagada	Muniguda	Kuntabadi	Salema	SSO Bamboo	K36	441	19	44	0.92	83	35	0.38
Rayagada	Muniguda	Kuntabadi	Salema	SSO Bamboo	K36	441	19	43	57.86	83	36	0.44

## IX. Geo Tagging of Sampled out other than Plantation activities under Berhampur Circle

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
1	Ghumsar South	Aska	Dharakote	Bahanrapur	Water Body	2016-17	19.677	84.555
2	Ghumsar South	Aska	Dharakote	Dharakote	Nursery Shed	2013-14	19.695	84.541
3	Ghumsar South	Aska	Dharakote	Dharakote	Forest Quarter & Resident	2013-14	19.645	84.578
4	Ghumsar South	Soroda	Gajalbadi South	Gajalbadi	Forest officer's residence/ office	2016-17	19.798	84.247
5	Ghumsar South	Soroda	Raipada Rf	Karadabadi	Water Body	2016-17	19.744	84.456
6	Ghumsar South	Soroda	Banjara	Banjara	Sacred Grove	2015-16	19.781	84.383
7	Ghumsar South	Soroda	Sidhipur	Khariguda	Mega Nursery	2016-17	19.754	84.433
8	Ghumsur North	Mujagada	Bhanjanagar	Bhanjanagar	Range Office	2011-12	19.929	84.585
9	Ghumsur North	Mujagada	Bhanjanagar	Bhanjanagar	Portable PS System	2016-17	19.929	84.585
10	Ghumsur North	Mujagada	Bhanjanagar	Bhanjanagar	Overhead Water tank	2013-14	19.947	84.563
11	Ghumsur North	Mujagada	Bhanjanagar	Bhanjanagar	Seedling Yard	2013-14	19.947	84.563
12	Ghumsur North	Mujagada	Bhanjanagar	Bhanjanagar	Pump house	2013-15	19.947	84.563
13	Ghumsur North	Mujagada	Bhanjanagar	Bhanjanagar	Watchman Shed	2013-14	19.947	84.563
14	Ghumsur North	Mujagad	Mujagad	Mujagad	Compound Wall	2016-17	20.025	84.514
15	Ghumsur North	Mujagad	Mujagad	Mujagad	Forester Quarter	2016-17	20.025	84.514
16	Ghumsur North	Mujagad	Mujagad	Mujagad	Causeway	2016-17	19.971	84.522
17	Ghumsur North	Mujagad	Mujagad	Mujagad	Elephant proof trench	2015-16	20.002	84.506
18	Ghumsur North	Tarasingh	Tarasingh	Tarasingh	Malkhana	2012-13	20.093	84.752
19	Ghumsur North	Tarasingh	Tarasingh	Tarasingh	Forest Guard Quarter	2012- 13	20.094	84.685
20	Ghumsur North	Tarasingh	Tarasingh	Tarasingh	Forester Quarter	2013-14	20.094	e84.685
21	Ghumsur North	Tarasingh	Tarasingh	Tarasingh	Permanent Nursery Shed	2012-13	20.093	84.685
22	Ghumsur North	Tarasingh	Tarasingh	Tarasingh	Forest Guard Quarter	2013-14	20.215	84.788
23	Paralakhemundi	Chandragiri	Podamari	T.Gobindpur	Waterbody	2013-14	19.644	84.459
24	Paralakhemundi	Chandragiri	Podamari	T.Gobindpur	RescueCentre	2016-17	19.488	84.396
25	Paralakhemundi	Chandragiri	Podamari	T.Gobindpur	Ticket Booking counter	2016-17	19.354	84.397
26	Paralakhemundi	Chandragiri	Podamari	T.Gobindpur	Elephant Barrier	2009-10	19.610	84.465
27	Paralakhemundi	Chandragiri	Podamari	T.Gobindpur	Range office	2012-13	19.525	84.466



Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
28	Paralakhemundi	Chandragiri	Podamari	T.Gobindpur	Barrack	2012-13	19.526	84.466
29	Paralakhemundi	Mahindra	Narayanpur	Narayanpur-2	Range office	2012-13	18.894	84.190
30	Paralakhemundi	Mahindra	Garabandha	Kinduling	Forest Guard quarter	2012-13	18.919	84.466
31	Paralakhemundi	Mahindra	Narayanpur	Narayanpur-2	Malkhana	2012-13	19.005	84.199
32	Paralakhemundi	Mahindra	Narayanpur 2	Narayanpur-2	Water Body	2014-15	18.903	85.257
33	Paralakhemundi	Devgiri	Paralakhemundi	paralakhemundi-1	Range officer quarter	2012-13	18.774	84.102
34	Paralakhemundi	Devgiri	Paralakhemundi	paralakhemundi-1	Range office	2011-12	18.775	84.100
35	Paralakhemundi	Devgiri	Paralakhemundi	paralakhemundi-1	Forest Guard quarter	2012-13	18.808	84.117
36	Boudh	Puruna Cuttack	Puruna Cuttack	Puruna Cuttack	Range office	2012-13	20.940	84.207
37	Boudh	Puruna Cuttack	Puruna Cuttack	Puruna Cuttack	Ranger's Quarter	2012-13	20.794	84.573
38	Boudh	Puruna Cuttack	Puruna Cuttack	Sakasingha	Forest guard quarter	2009-10	20.788	84.677
39	Boudh	Puruna Cuttack	Puruna Cuttack	Puruna Cuttack	Common Toilet	2012-13	20.797	84.572
40	Boudh	Boudh	Boudh	Butbali	Ranger office	2012-13	20.846	84.316
41	Boudh	Boudh	Boudh	Butbali	Staff Barrack	2012-13	20.846	84.316
42	Boudh	Boudh	Khajuripada	Debabandha	Section office	2013-14	20.823	84.259
43	Boudh	Boudh	Boudh	Devgarh	Permanent Nursery	2013-14	20.775	84.299
44	Boudh	Madhapur	Baringi	Madhapur	Common Toilet	2012-13	20.707	84.595
45	Boudh	Madhapur	Baringi	Madhapur	Range Office	2012-13	20.706	84.594
46	Boudh	Madhapur	Baringi	Baring	Water body	2013-14	20.433	84.707
47	Boudh	Madhapur	Adenigarh	Adenigarh	Forest Guard Quarter	2016-17	20.740	84.553
48	Boudh	Madhapur	Adenigarh	Adenigarh	Forester Quarter	2016-17	20.741	84.551
49	Boudh	Madhapur	Baringi	Madhapur	Sacred Grove	2014-15	20.710	84.597
50	Balliguda	Balliguda	Kurtmagada	Malangi	Water body	2013-14	20.121	83.900
51	Balliguda	Balliguda	Kurtmagada	Kurtmagada	Forest Guard Quarter	2012-13	20.241	83.814
52	Balliguda	Balliguda	Kurtmagada	Mangapanga	Forest Guard Quarter	2013-14	20.242	83.814
53	Balliguda	Balliguda	Kurtmagada	Kurtmagada	Compound wall	2013-14	20.241	83.814
54	Balliguda	Balliguda	Balliguda	Balliguda	Mega Nursery		20.381	84.159
55	Balliguda	Balliguda	Balliguda	Balliguda	Road	2013-14	20.378	84.123

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
56	Balliguda	Balliguda	Balliguda	Balliguda	Range office	2011-12	20.208	84.112
57	Balliguda	Tumudibandha	Kotogarh	Dengiguda	Forest Guard Quarter	2016-17	19.915	83.866
58	Balliguda	Tumudibandha	Kotogarh	Dengiguda	Seizure yard shed	2014-15	19.966	83.706
59	Balliguda	Tumudibandha	Durgapanga	Dharakote	Forest Guard Quarter	2015-16	19.829	83.718
60	Balliguda	Tumudibandha	Tumudibandha	Tumudibandha	Range office	2011-12	19.966	83.701
61	Balliguda	Tumudibandha	Tumudibandha	Tumudibandha	Staff Barrack	2013-14	19.966	83.706
62	Balliguda	Simanbadi	Budhaguda	Budhaguda	Forest Guard Quarter	2013-14	20.120	84.001
63	Balliguda	Simanbadi	Budhaguda	Budhaguda	Forester quarter/ office	2016-17	20.115	83.002
64	Balliguda	Simanbadi	Simanbadi	Simanbadi	Range office	2015-16	20.129	84.164
65	Berhampur	Digapahandi	Digapahandi	Digapahandi	Range Office	2012-13	19.384	84.565
66	Berhampur	Digapahandi	Digapahandi	Digapahandi	Staff Barrack	2012-13	19.379	84.566
67	Berhampur	Digapahandi	Digapahandi	Digapahandi	Forest Guard Quarter	2012-13	19.385	84.565
68	Berhampur	Digapahandi	Digapahandi	Digapahandi	Range officer's residence	2015-16	19.384	84.565
69	Berhampur	Digapahandi	Digapahandi	Digapahandi	Common toilet	2012-13	19.383	84.560
70	Berhampur	Digapahandi	Digapahandi	Digapahandi	Compound wall	2015-16	19.388	84.565
71	Berhampur	Digapahandi	Digapahandi	Digapahandi	Cause way	2014-15	19.384	84.565
72	Berhampur	Digapahandi	Digapahandi	Digapahandi	Malkhana	2013-14	19.385	84.550
73	Berhampur	Digapahandi	Digapahandi	Digapahandi	Watcher shed of permanent nursery	2013-14	19.385	84.550
74	Berhampur	Digapahandi	Godahada	Godahada	Seizure yard	2014-15	19.293	84.466
75	Berhampur	Digapahandi	Godahada	Godahada	Compound wall	2013-14	19.293	84.466
76	Berhampur	Digapahandi	Digapahandi	Godahada	Watch Tower	2016-17	19.288	84.462
77	Berhampur	Digapahandi	Digapahandi	Godahada	Forest Guard Quarter	2013-14	19.293	84.466
78	Berhampur	Digapahandi	Digapahandi	Digapahandi	Culvert	2016-17	19.289	84.464
79	Berhampur	Digapahandi	Digapahandi	Ralyaupur	Water Body-Damodarpur	2015-16	19.303	84.499
80	Berhampur	Khalikote	Khalikote	Khalikote	Compound wall	2011-12	19.607	85.080
81	Berhampur	Khalikote	Khalikote	Khalikote	Range office	2012-13	19.607	85.080
82	Berhampur	Khalikote	Khalikote	Khalikote	Staff Barrack	2012-13	19.607	83.079

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
83	Berhampur	Khalikote	Khalikote	Khalikote	Seizure Yard	2012-13	19.606	85.072
84	Berhampur	Khalikote	Khalikote	Khalikote	Range officer's residence	2012-13	19.607	85.079
85	Berhampur	Khalikote	Khalikote	Khalikote	Mega Nursery-near Karakhola PRF	2014-15	19.581	85.102
86	Berhampur	Khalikote	Khalikote	Khalikote	Water Body-near Karakhola PRF	2012-13	19.581	85.102
87	Berhampur	Khalikote	Rambha	Rambha	VHF Tower	2015-16	19.526	85.090
88	Berhampur	Khalikote	Rambha	Rambha	Forester residence cum office	2015-16	19.526	85.090
89	Berhampur	Khalikote	Rambha	Rambha	Forest Guard Quarter	2015-16	19.526	85.090
90	Berhampur	Khalikote	Khalikote	Narayani	Anti-poaching centre	2010-11	19.694	85.140
91	Berhampur	Khalikote	Rambha	Rambha	EPA	2015-16	19.388	85.058
92	Berhampur	Khalikote	Rambha	Rambha	Fencing	2015-16	19.388	85.060
93	Berhampur	Khalikote	Narayani	Narayani	Anti-poaching centre	2010-11	19.669	85.147
94	Berhampur	Khalikote	Narayani	Narayani	Compound wall	2012-13	19.669	85.147
95	Berhampur	Berhampur	Amunia	Amunia	Nursery shed	2013-14	19.226	84.664
96	Phulbani	Phulbani	Bisipada	Balsakumpa	Forest guard Qtr.	2014-15	20.430	84.317
97	Phulbani	Phulbani	Bisipada	Balsakumpa	Borewell	2014-15	20.430	84.317
98	Phulbani	Phulbani	Bisipada	Balsakumpa	Compound wall	2016-17	20.430	84.317
99	Phulbani	Phulbani	Bisipada	Bisipada	Rest shed, CNG at bisipada check gate	2013-14	20.419	84.227
100	Phulbani	Phulbani	Bisipada	Bisipada	Tube well	2013-14	20.419	84.227
101	Phulbani	Phulbani	Bisipada	Bisipada	Gate operating hall at CNG Bisipada	2013-14	20.419	84.227
102	Phulbani	Phulbani	Phulbani	Panaspadara	Sacred grooves-Maa kalapattadevi	2015-16	20.521	84.239
103	Phulbani	G.Udaygiri	G.Udaygiri	G.Udaygiri	Model Range office	2013-13	20.127	84.364
104	Phulbani	G.Udaygiri	G.Udaygiri	G.Udaygiri	Compound wall	2012-13	20.127	84.364
105	Phulbani	G.Udaygiri	G.Udaygiri	G.Udaygiri	Seizure Yard	2013-14	20.127	84.364
106	Phulbani	G.Udaygiri	G.Udaygiri	G.Udaygiri	Forester Qtr.	2015-16	20.127	84.364
107	Phulbani	G.Udaygiri	G.Udaygiri	G.Udaygiri	Borewell	2012-13	20.127	84.364



Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
108	Phulbani	G.Udaygiri	G.Udaygiri	G.Udaygiri	Staff Barrack	2012-13	20.127	84.364
109	Phulbani	G.Udaygiri	G.Udaygiri	G.Udaygiri	Forest Guard Quarter	2011-12	20.166	84.256
110	Phulbani	G.Udaygiri	Paburia	Paburia	Compound wall	2011-12	20.166	84.256
111	Phulbani	G.Udaygiri	Ghu.Udaygiri	Paburi	Rest room, CNG at bisipada	2013-14	20.163	84.416
112	Phulbani	G.Udaygiri	Kalinga	Kalinga	Forester Quarter	2011-12	20.163	84.416
113	Phulbani	G.Udaygiri	Kalinga	Kalinga	Forest check gate	2013-14	20.163	84.416
114	Phulbani	G.Udaygiri	Kalinga	Kalinga	Water Body	2016-17	20.150	84.393
115	Phulbani	G.Udaygiri	Kalinga	Kalinga	Forest guard quarter	2012-13	20.165	84.414
116	Phulbani	G.Udaygiri	Kalinga	Kalinga	Tube well	2012-13	20.213	84.390
117	Phulbani	Phiringia	Gochapada	Gochapada	Forester Quarter cum office	2015-16	20.478	92.998
118	Phulbani	Phiringia	Phiringia	Musulipanga	Forest Guard Qtr.	2013-14	20.425	84.020
119	Phulbani	Phiringia	Nuapadara	Rabingia	Office cum residence of forester	2015-16	20.326	84.040
120	Phulbani	Phiringia	Nuapadara	Rabingia	Compound wall	2012-13	20.326	84.040

## X. Geo Tagging of Sampled out other than Plantation activities under Angul Circle

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
1	Satakosia Wild Life	Tikarpada	Tikarpada	Tikarpada	Range office	2011-12	20.597	84.786
2	Satakosia Wild Life	Tikarpada	Tikarpada	Tikarpada	Range officer's quarter	2015-16	20.597	84.786
3	Satakosia Wild Life	Tikarpada	Tikarpada	Tikarpada	Staff Barrack	2012-13	20.597	84.785
4	Satakosia Wild Life	Tikarpada	Tikarpada	Tikarpada	Water body	2016-17	20.597	84.821
5	Satakosia Wild Life	Tikarpada	Tikarpada	Tikarpada	Saltlick	2011-12	20.596	84.826
6	Satakosia Wild Life	Tikarpada	Majhipada	Naleswar	Forest Guard Quarter	2014-15	20.626	84.714
7	Satakosia Wild Life	Pampasara	Pampasar	Pampasara-A	Range office	2012-13	20.703	84.948
8	Satakosia Wild Life	Pampasara	Pampasar	Pampasara-A	Range officer's quarter	2013-14	20.702	84.947
9	Satakosia Wild Life	Pampasara	Kumuri	Kumuri-A	Forest Guard Quarter	2013-14	20.724	84.791
10	Satakosia Wild Life	Pampasara	Pampasar	Pampasar-B	Water body	2015-16	20.704	84.920
11	Satakosia Wild Life	Pampasara	Pampasar	Pampasar-A	Staff Barrack	2012-13	20.684	84.947
12	Satakosia Wild Life	Pampasara	Kumuri	Kumuri-B	Watch Tower	2015-16	20.716	84.810
13	Satakosia Wild Life	Pampasara	Tamaka	Tarabha-A	Antipoaching Shed	2014-15	20.686	84.836
14	Satakosia Wild Life	Pampasara	Kumuri	Kumuri-B	VHF Tower	2015-16	20.724	84.790
15	Satakosia Wild Life	Pampasara	Kumuri	Kumuri-A	Causeway	2012-13	20.751	84.790
16	Satakosia Wild Life	Purunakote	Purunakote	Purunakote	Range office	2012-13	20.646	84.836
17	Satakosia Wild Life	Purunakote	Purunakote	Purunakote	Range officer's quarter	2014-15	20.646	84.835
18	Satakosia Wild Life	Purunakote	Baghamunda	Baghamunda-A	Forester office-cum-residence	2016-17	20.707	84.789
19	Satakosia Wild Life	Purunakote	Baghamunda	Baghamunda-C	Forest Guard Quarter	2015-16	20.707	84.789
20	Satakosia Wild Life	Purunakote	Baghamunda	Baghamunda	Water body	2012-13	20.701	84.776
21	Satakosia Wild Life	Purunakote	Tuluka	Tuluka - A	Saltlick	2014-15	20.625	84.950
22	Satakosia Wild Life	Purunakote	Tuluka North	Tuluka - C	Check Dam	2014-15	20.625	84.950
23	Satakosia Wild Life	Purunakote	Purunakote	Chhotkei	Check Gate	2013-14	20.631	84.887
24	Satakosia Wild Life	Purunakote	Tuluka North	Tuluka - B	Staff Barrack	2016-17	20.634	84.941
25	Satakosia Wild Life	Purunakote	Baghamunda	Baghamunda-C	Forest Road	2013-14	20.702	84.793
26	Satakosia Wild Life	Purunakote	Baghamunda	Baghamunda-C	Causeway	2014-15	20.702	84.793
27	Mahanadi Wild Life	Banigochha East	Takera	Takera	Range office	2012-13	20.357	84.807

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
28	Mahanadi Wild Life	Banigochha East	Takera	Takera	Interpretation centre	2009-10	20.357	84.807
29	Mahanadi Wild Life	Banigochha East	Takera	Takera	Deer Park	2012-13	20.356	84.805
30	Mahanadi Wild Life	Banigochha East	Badasilinga	Badasilinga	Forester office-cum-residence	2015-16	20.447	84.802
31	Mahanadi Wild Life	Banigochha East	Badasilinga	Badasilinga	Forest Guard Quarter	2010-11	20.447	84.802
32	Mahanadi Wild Life	Banigochha East	Badasilinga	Badasilinga	Staff Barrack	2012-13	20.446	84.802
33	Mahanadi Wild Life	Banigochha East	Badasilinga	Badasilinga	Water body	2012-13	20.476	84.789
34	Mahanadi Wild Life	Banigochha East	Badasilinga	Badasilinga	Meadow Development	2016-17	20.478	84.805
35	Mahanadi Wild Life	Banigochha East	Dhipasahi	Dhipasahi	Antipoaching Shed	2014-15	20.492	84.784
36	Mahanadi Wild Life	Banigochha East	Dhipasahi	Dhipasahi	Causeway	2012-13	20.518	84.783
37	Mahanadi Wild Life	Banigochha East	Dhipasahi	Dhipasahi	Forest Road	2012-13	20.518	84.786
38	Mahanadi Wild Life	Chhamundia	Chhamundia	Chhamundia	Range office	2011-12	20.477	84.944
39	Mahanadi Wild Life	Chhamundia	Chhamundia	Chhamundia	Range officer's quarter	2013-14	20.477	84.943
40	Mahanadi Wild Life	Chhamundia	Badamula	Badamula	Forester office-cum-residence	2013-14	20.499	84.872
41	Mahanadi Wild Life	Chhamundia	Purunapani	Purunapani	Forest Guard Quarter	2013-14	20.476	84.823
42	Mahanadi Wild Life	Chhamundia	Chhamundia	Chhamundia	Staff Barrack	2012-13	20.476	84.944
43	Mahanadi Wild Life	Chhamundia	Purunapani	Purunapani	Boundary Wall	2013-14	20.476	84.823
44	Mahanadi Wild Life	Chhamundia	Dhipasahi	Dhipasahi	Water body	2015-16	20.522	84.743
45	Mahanadi Wild Life	Chhamundia	Purunapani	Purunapani	Meadow Development	2014-15	20.477	84.829
46	Mahanadi Wild Life	Chhamundia	Dhipasahi	Dhipasahi	Antipoaching Shed	2016-17	20.519	84.795
47	Mahanadi Wild Life	Chhamundia	Purunapani	Purunapani	Causeway	2015-16	20.478	84.826
48	Mahanadi Wild Life	Chhamundia	Badamula	Malisahi	Forest Road	2015-16	20.494	84.832
49	Mahanadi Wild Life	Chhamundia	Badamula	Malisahi	Watch Tower	2016-17	20.501	84.841
50	Mahanadi Wild Life	Chhamundia	Badamula	Badamula	Check Gate Shed	2016-17	20.500	84.870
51	Mahanadi Wild Life	Chhamundia	Badamula	Badamula	Elephant Trench Proof	2015-16	20.494	84.832
52	Mahanadi Wild Life	Chhamundia	Purunapani	Purunapani	VHF Tower	2015-16	20.463	84.829
53	Mahanadi Wild Life	Chhamundia	Purunapani	Purunapani	Earthen Graded Bond	2015-16	20.478	84.826
54	Mahanadi Wild Life	Chhamundia	Dhipasahi	Gargedi	Saltlick	2014-15	20.519	84.809
55	Mahanadi Wild Life	Kusanga	Kusanga	Kusanga	Range office	2012-13	20.583	84.665



Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
56	Mahanadi Wild Life	Kusanga	Kusanga	Kusanga	Range officer's quarter	2012-13	20.583	84.665
57	Mahanadi Wild Life	Kusanga	Sripaju	Sripaju	Forester office-cum-residence	2011-12	20.543	84.727
58	Mahanadi Wild Life	Kusanga	Sitalapani	Sunakharia	Forest Guard Quarter	2012-13	20.606	84.750
59	Mahanadi Wild Life	Kusanga	Sitalapani	Atalsara	Boundary Wall	2012-13	20.605	84.714
60	Mahanadi Wild Life	Kusanga	Kusanga	Nuapada	Water body	2016-17	20.573	84.709
61	Mahanadi Wild Life	Kusanga	Sripaju	Padmatola	Meadow Development	2016-17	20.540	84.759
62	Mahanadi Wild Life	Kusanga	Sitalapani	Atalsara	Antipoaching Shed	2009-10	20.611	84.725
63	Mahanadi Wild Life	Kusanga	Sitalapani	Marada	Causeway	2013-14	20.578	84.785
64	Mahanadi Wild Life	Kusanga	Kusanga	Nuapada	Forest Road	2016-17	20.560	84.722
65	Mahanadi Wild Life	Kusanga	Sripaju	Padmatola	Watch Tower	2016-17	20.545	84.744
66	Mahanadi Wild Life	Kusanga	Kusanga	Kumuri	Check Gate Shed	2011-12	20.588	84.677
67	Mahanadi Wild Life	Kusanga	Sitalapani	Sitalpani	Surface Dyke	2016-17	20.605	84.749
68	Mahanadi Wild Life	Kusanga	Kusanga	Kumuri	Tube well	2011-12	20.592	84.683
69	Mahanadi Wild Life	Kusanga	Kusanga	Nuapada	Saltlick	2016-17	20.568	84.723
70	Mahanadi Wild Life	Kusanga	Sripaju	Padmatola	Solar fencing	2016-17	20.554	84.729
71	Mahanadi Wild Life	Kusanga	Kusanga	Kumuri	Nursery watch shed	2011-12	20.592	84.683
72	Mahanadi Wild Life	Kusanga	Kusanga	Kusanga	Seizure Yard	2011-12	20.583	84.665
73	Angul	Bantala	Khinda	Pokatunga	Range office	2012-13	20.743	85.063
74	Angul	Bantala	Khinda	Pokatunga	Range officer's quarter	2015-16	20.743	85.063
75	Angul	Bantala	Kanja	Kanja	Forester office-cum-residence	2013-14	20.649	84.114
76	Angul	Bantala	Kanja	Kanja	Forest Guard Quarter	2013-14	20.649	84.114
77	Angul	Bantala	Kanja	Kanja	Tube well	2013-14	20.649	84.114
78	Angul	Bantala	Kanja	Kanja	VHF Tower	2015-16	20.649	84.114
79	Angul	Bantala	Kanja	Kanja	Water body	2013-14	20.638	85.123
80	Angul	Chhendipada	Chhendipada	Chhendipada	Range office	2011-12	21.079	84.876
81	Angul	Chhendipada	Chhendipada	Chhendipada	Range officer's quarter	2012-13	21.079	84.876
82	Angul	Chhendipada	Chhendipada	Chhendipada	Forest Guard Quarter	2014-15	21.083	85.371
83	Angul	Chhendipada	Chhendipada	Kampasada	Water body	2013-14	21.106	84.916

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
84	Angul	Chhendipada	Chhendipada	Kampasada	Sacred Groves	2016-17	21.130	84.912
85	Angul	Kaniha	Kaniha	Kaniha	Range office	2012-13	21.094	85.058
86	Angul	Kaniha	Kaniha	Sapkota	Water Body	2013-14	21.175	85.030
87	Angul	Kaniha	Kaniha 2	Hanumanpur	Forester office-cum-residence	2015-16	21.146	85.060
88	Angul	Kaniha	Kaniha 2	Hanumanpur	Forest Guard Quarter	2009-10	21.146	85.060
89	Dhenkanal	Hindol	Dandari	Kanka -A	Watch Tower	2015-16	20.567	85.237
90	Dhenkanal	Hindol	Dandari	Kanka -A	Water Body	2013-14	20.567	85.236
91	Dhenkanal	Hindol	Hindol	Hindol	Forest Road	2014-15	20.570	85.231
92	Dhenkanal	Hindol	Hindol	Hindol	Culvert	2014-15	20.570	85.231
93	Dhenkanal	Hindol	Hindol	Hindol	Range office	2011-12	20.605	85.189
94	Dhenkanal	Hindol	Hindol	Hindol	Range officer's quarter	2012-13	20.611	85.196
95	Dhenkanal	Dhenkanal	Sadar	Kunjakanta	Range office	2012-13	20.647	85.612
96	Dhenkanal	Dhenkanal	Sadar	Kunjakanta	Range officer's quarter	2013-14	20.647	85.612
97	Dhenkanal	Dhenkanal	Sadar	Kunjakanta	Forester office-cum-residence	2015-16	20.647	85.612
98	Dhenkanal	Dhenkanal	Sadar	Kunjakanta	Staff Barrack	2014-15	20.637	85.616
99	Dhenkanal	Dhenkanal	Sadar	Kunjakanta	Malkhana	2013-14	20.637	85.616
100	Dhenkanal	Sadangi	Khankira	Mundamani	Watch Tower	2015-16	20.747	85.892
101	Dhenkanal	Sadangi	Sadangi	Sadangi	Range officer's quarter	2015-16	20.810	85.834
102	Dhenkanal	Sadangi	Sadangi	Sadar	Forest Guard Quarter	2013-14	20.810	85.834
103	Dhenkanal	Sadangi	Sadangi	Kosipur	Forest Road	2014-15	20.611	85.888
104	Dhenkanal	Sadangi	Khankira	Chotatentuli	Water Body	2014-15	20.770	85.893
105	Athamalik	Bamur	Bamur	Bamur	Range office	2010-11	21.012	84.483
106	Athamalik	Bamur	Sargipali	GadaGhumra	Water body	2015-16	21.063	84.548
107	Athamalik	Bamur	Bamur	Bamur	Culvert	2015-16	21.042	84.496
108	Athamalik	Bamur	Sargipali	GadaGhumra	Causeway	2014-15	21.046	84.546
109	Athamalik	Bamur	Kadalimunda	Tentalapai	Permanent Nursery	2014-15	20.921	84.411
110	Athamalik	Bamur	Kadalimunda	Tentalapai	VHF Tower	2015-16	20.924	84.419
111	Athamalik	Bamur	Kadalimunda	Tentalapai	Tube well	2013-14	20.924	84.419

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
112	Athamalik	Bamur	Kadalimunda	Tentalapai	Forester office-cum-residence	2016-17	20.924	84.419
113	Athamalik	Bamur	Kadalimunda	Tentalapai	Forest Guard Quarter	2013-14	20.924	84.419
114	Athamalik	Bamur	Kadalimunda	Tentalapai	Boundary Wall	2015-16	20.924	84.419
115	Athamalik	Madhapur	Dekund	Bharatpur	Forest Guard Quarter	2011-12	20.880	84.451
116	Athamalik	Madhapur	Madhapur	Bilipur	Forest Road	2015-16	20.801	84.467
117	Athamalik	Madhapur	Madhapur	Madhapur	Range office	2011-12	20.786	84.418
118	Athamalik	Madhapur	Madhapur	Khandapada	Nursery watch shed	2011-12	20.814	84.390
119	Athamalik	Madhapur	Madhapur	Bilipur	Culvert	2014-15	20.800	84.494
120	Athamalik	Madhapur	Kiakata	Kiakata	Forester office-cum-residence	2016-17	20.865	84.321
121	Athamalik	Madhapur	Kiakata	Kiakata	Tube well	2012-13	20.865	84.321
122	Athamalik	Madhapur	Madhapur	Bilipur	Causeway	2016-17	20.801	84.467
123	Athamalik	Madhapur	Dekund	Bharatpur	Water body	2012-13	20.849	84.477
124	Athamalik	Madhapur	Dekund	Raniakota	Sacred Groves	2014-15	20.877	84.448
125	Athamalik	Handapa	Urkela	Takaba	Culvert	2009-10	20.972	84.626
126	Athamalik	Handapa	Urkela	Takaba	VHF Tower	2015-16	20.953	84.687
127	Athamalik	Handapa	Urkela	Takaba	Staff Barrack	2010-11	21.004	84.638
128	Athamalik	Handapa	Urkela	Takaba	Forest Guard Quarter	2012-13	21.004	84.638
129	Athamalik	Handapa	Urkela	Takaba	Forest Road	2013-14	21.036	84.633
130	Athamalik	Handapa	Urkela	Takaba	Causeway	2013-14	21.036	84.633
131	Athamalik	Handapa	Urkela	Takaba	Water body	2014-15	21.027	84.643
132	Athamalik	Handapa	Urkela	Takaba	Sacred Groves	2015-16	21.035	84.636
133	Athamalik	Handapa	Urkela	Handapa	Range office	2011-12	20.953	84.687
134	Cuttack	Sukinda	Sukinda	Pimpudih	Watch Tower	2013-14	21.027	85.833
135	Cuttack	Sukinda	Sukinda	Patapur	Forest Road	2011-12	21.005	85.913
136	Cuttack	Sukinda	Sukinda	Patapur	Water Body	2012-13	21.036	85.921
137	Cuttack	Sukinda	Sukinda	Patapur	Causeway	2011-12	21.005	85.913
138	Cuttack	Sukinda	Sukinda	Patapur	Culvert	2011-12	21.005	85.913
139	Cuttack	Sukinda	Sukinda	Sukinda	Forest Guard Quarter	2012-13	20.961	85.915



Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
140	Cuttack	Sukinda	Sukinda	Nalida	Boundary Wall	2016-17	20.961	85.915
141	Cuttack	Sukinda	Sukinda	Sukinda	Staff Barrack	2009-10	20.960	85.916
142	Cuttack	Sukinda	Sukinda	Sukinda	Forester office-cum-residence	2012-13	20.961	85.916
143	Cuttack	Sukinda	Sukinda	Sukinda	Range office	2010-11	20.961	85.916
144	Cuttack	Tomka	Tomka	Tomka	VHF Tower	2015-16	21.084	85.954
145	Cuttack	Tomka	Kansa	Kansa(B)	Forest Guard Quarter	2015-16	21.064	85.868
146	Cuttack	Tomka	Kansa	Kansa(B)	Forester office-cum-residence	2015-16	21.064	85.868
147	Cuttack	Tomka	Tomka	Duburi	Common Toilet	2011-12	20.999	85.983
148	Cuttack	Tomka	Tomka	Duburi	Seizure Yard	2012-13	20.999	85.983
149	Cuttack	Tomka	Kansa	Kansa	Forest Road	2014-15	21.062	85.848
150	Cuttack	Tomka	Kansa	Kansa	Water Body	2012-13	21.066	85.879
151	Cuttack	Tomka	Tomka	Tomka	Staff Barrack	2012-13	21.084	85.954
152	Cuttack	Tomka	Tomka	Duburi	Range office	2011-12	20.999	85.983
153	Cuttack	Dalijoda	Byree	Byree	Water body	2012-13	20.672	86.046
154	Cuttack	Dalijoda	Chandikhol	Chandikhol	Forester office-cum-residence	2012-13	20.703	86.122
155	Cuttack	Dalijoda	Chandikhol	Nalida	Tube well	2013-14	20.703	86.122
156	Cuttack	Dalijoda	Byree	Byree	Staff Barrack	2012-13	20.632	86.033
157	Cuttack	Dalijoda	Byree	Byree	Range office	2012-13	20.632	86.033
158	Cuttack	Dalijoda	Chandikhol	Nalida	Forest Guard Quarter	2012-13	20.685	86.037
159	Cuttack	Dalijoda	Chandikhol	Lalitgiri	Watch Tower	2016-17	20.652	86.242
160	Athagarh	Athagarh	Athagarh	Athagarh	Range office	2011-12	20.521	85.637
161	Athagarh	Athagarh	Athagarh	Athagarh	Forest Guard Quarter	2016-17	20.521	85.637
162	Athagarh	Athagarh	Tigiria	Tigiria	Forester office-cum-residence	2013-14	20.465	85.520
163	Athagarh	Athagarh	Tigiria	Tigiria	Water Body	2011-12	20.494	85.506
164	Athagarh	Athagarh	Rajanagar	Rajanagar	Central Nursery	2013-14	20.496	85.662
165	Athagarh	Narsinghpur East	Narsinghpur	Narsinghpur	Range office	2013-14	20.459	85.072
166	Athagarh	Narsinghpur East	Narsinghpur	Narsinghpur	Range officer's quarter	2013-14	20.458	85.071
167	Athagarh	Narsinghpur East	Narsinghpur	Narsinghpur	Seizure Yard	2013-14	20.458	85.072

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
168	Athagarh	Narsinghpur East	Devabhuin	Devabhuin	Causeway	2013-14	20.551	85.174
169	Athagarh	Narsinghpur East	Devabhuin	Devabhuin	Forester office-cum-residence	2016-17	20.551	85.174
170	Athagarh	Narsinghpur East	Devabhuin	Olab	Forest Guard Quarter	2013-14	20.506	85.212
171	Athagarh	Narsinghpur East	Devabhuin	Jadapada	Watch Tower	2014-15	20.522	85.195
172	Athagarh	Narsinghpur East	Devabhuin	Jadapada	Water Body	2013-14	20.520	85.197
173	Athagarh	Badamba	Badamba	Khalimati	Water Body	2013-14	20.462	85.340
174	Athagarh	Badamba	Badamba	BadambaSadar	Forest Road	2014-15	20.454	85.329
175	Athagarh	Badamba	Badamba	BadambaSadar	Causeway	2012-13	20.454	85.329
176	Athagarh	Badamba	Badamba	Aranda	Culvert	2016-17	20.471	85.308
177	Athagarh	Badamba	Badamba	Badamba	Staff Barrack	2012-13	20.415	85.351
178	Athagarh	Badamba	Badamba	Badamba	Range office	2012-13	20.414	85.351

## XI. Geo Tagging of Sampled out other than Plantation activities under Baripada Circle

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
1	Keonjhar WL	Hadagarh	Kathakata	Kathakata	Forester Quarter	2014-15	21.254	86.223
2	Keonjhar WL	Hadagarh	Kathakata	Pitanau	Meadow (Maintenance)	2014-15	21.279	86.240
3	Keonjhar WL	Hadagarh	Kathakata	Pitanau	Salt Lick (Maintenance)	2014-15	21.279	86.240
4	Keonjhar WL	Hadagarh	Kathakata	Kathakata	Watch tower	2013-14	21.265	86.228
5	Keonjhar WL	Hadagarh	Kathakata	Pitanau	Causeway	2013-14	21.287	86.242
6	Keonjhar WL	Hadagarh	Kathakata	Pitanau	Culvert	2013-14	21.290	86.245
7	Keonjhar WL	Hadagarh	Kathakata	Pitanau	Forest Guard Quarter	2012-13	21.285	86.241
8	Keonjhar WL	Hadagarh	Hadagarh	Hadagarh	Range Office	2010-11	21.274	86.299
9	Keonjhar WL	Hadagarh	Hadagarh	Hadagarh	Rangers Residence	2015-16	21.274	86.299
10	Keonjhar WL	Hadagarh	Hadagarh	Hadagarh	Compound wall	2010-11	21.274	86.299
11	Keonjhar WL	Brahmanipal	Daitari	Talapada	Range Office	2012-13	21.113	86.830
12	Keonjhar WL	Brahmanipal	Daitari	Talapada	Barrack	2014-15	21.113	86.830
13	Keonjhar WL	Brahmanipal	Daitari	Talapada	Camp Shed	2010-11	21.113	86.830
14	Keonjhar WL	Brahmanipal	Daitari	Talapada	Malkhana	2011-12	21.113	86.830
15	Keonjhar WL	Brahmanipal	Daitari	Talapada	Watcher shed	2013-14	21.113	85.830
16	Keonjhar WL	Anandapur	Ramchandrapur	Patilo	Forest Guard Quarter	2011-12	21.123	86.087
17	Keonjhar WL	Anandapur	Ramchandrapur	Baranga	Water Body	2013-14	21.054	86.052
18	Keonjhar WL	Anandapur	Ramchandrapur	Baranga	Scared Groove	2016-17	21.050	86.041
19	Keonjhar WL	Anandapur	Gayalamunda	Gayalamunda	Barrack	2012-13	21.402	86.113
20	Keonjhar WL	Anandapur	Gayalamunda	Gayalamunda	Compound wall	2012-13	21.411	86.119
21	Keonjhar WL	Brahmanipal	Brahmanipal	Brahmanipal	Forest Guard Quarter	2015-16	21.121	86.915
22	Keonjhar WL	Brahmanipal	Brahmanipal	Brahmanipal	Seizure yard	2012-13	21.121	85.915
23	Keonjhar WL	Brahmanipal	Daitari	Talapada	Water Body	2014-15	21.118	85.793
24	Keonjhar WL	Brahmanipal	Daitari	Talapada	Causeway	2011-12	21.118	85.815
25	Keonjhar WL	Brahmanipal	Daitari	Talapada	Culvert	2012-13	21.126	86.797
26	Keonjhar WL	Brahmanipal	Daitari	Talapada	Nursery shed	2011-12	21.125	85.797
27	Rairangapur	Rairangapur	Badamtolia	Bijatola	Water Body	2014-15	22.160	86.268



Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
28	Rairangapur	Bisoi	Talabandha	Talabandha	Forest Road	2009-10	22.017	86.310
29	Rairangapur	Bisoi	Talabandha	Talabandha	Causeway	2012-13	22.025	86.320
30	Rairangapur	Bisoi	Talabandha	Talabandha	Water Body	2012-13	22.017	86.309
31	Rairangapur	Bisoi	Talabandha	Talabandha	Forest Guard Quarter	2013-14	22.028	86.343
32	Rairangapur	Bisoi	Talabandha	Talabandha	Forest Guard Quarter	2013-14	22.029	86.343
33	Rairangapur	Badampahar	Hatabadra	Dubulabada	Water Body	2011-12	22.158	86.031
34	Rairangapur	Rairangapur	Badampat	Badampat	Range Office	2011-12	22.092	86.113
35	Rairangapur	Badampahar	Hatabadra	Dubulabada	Solar fencing	2013-14	0.000	0.000
36	Rairangapur	Badampahar	Hatabadra	Dubulabada	Water Body	2011-12	22.191	86.045
37	Rairangapur	Badampahar	Hatabadra	Dubulabada	Watch tower	2013-14	22.191	86.045
38	Rairangapur	Rairangapur	Badampat	Badampat	Forest Guard Quarter	2013-14	22.095	86.114
39	Rairangapur	Rairangapur	Rairangapur	Rairangapur	Range Office	2010-11	22.247	86.507
40	Rairangapur	Rairangapur	Badamtolia	Bijatola	Forest Guard Quarter	2012-13	22.208	86.299
41	Rairangapur	Rairangapur	Badamtolia	Bijatola	Forester Quarter	2012-13	22.208	86.299
42	Rairangapur	Rairangapur	Badamtolia	Bijatola	Malkhana	2013-14	22.266	86.175
43	Karanjia	Thakurmunda	Keshdiha	Mandalijhari	Scared Groove	2013-14	21.576	86.241
44	Karanjia	Thakurmunda	Keshdiha	Mandalijhari	Causeway	2013-14	21.597	86.238
45	Karanjia	Thakurmunda	Keshdiha	Mituari	Water Body	2014-15	21.575	86.213
46	Karanjia	Thakurmunda	Keshdiha	Mituari	Earthen Bund	2014-15	21.576	86.213
47	Karanjia	Thakurmunda	Keshdiha	Mandalijhari	Surface Dyke	2015-16	21.586	86.227
48	Karanjia	Thakurmunda	Keshdiha	Mandalijhari	Culvert	2012-13	21.586	86.227
49	Karanjia	Thakurmunda	Keshdiha	Mandalijhari	Forest Road	2011-12	21.586	86.228
50	Karanjia	Thakurmunda	Thakurmunda	Thakurmunda	Range Office	2010-11	21.522	86.154
51	Karanjia	Thakurmunda	Thakurmunda	Thakurmunda	Barrack	2011-10	21.522	86.154
52	Karanjia	Karanjia	Rarua	Raura	Forester Residence cum Office	2012-13	21.959	86.864
53	Karanjia	Karanjia	Singhada	Ghosoda	Scared Groove	2016-17	21.832	85.821
54	Karanjia	Karanjia	Singhada	Ghosoda	Water Body	2013-14	21.835	85.861
55	Karanjia	Karanjia	Singhada	Ghosoda	Forest Guard Quarter	2013-14	21.829	85.826

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
56	Karanjia	Karanjia	Singhada	Ghosoda	Forester Residence cum Office	2016-17	22.046	85.756
57	Karanjia	Dudhiani	Tato	Dari	Diaphragm (inverted concrete wall)	2014-15	21.840	85.967
58	Karanjia	Karanjia	Karanjia	Karanjia-1	Upgradation of Mega nursery	2013-14	21.770	85.972
59	Karanjia	Dudhiani	Tangabila	Tangabila	Scared Groove	2016-17	21.878	86.005
60	Karanjia	Dudhiani	Tangabila	Tangabila	Forest Guard Quarter	2015-16	21.905	86.042
61	Karanjia	Dudhiani	Ranipat	Ranipat	Earthen Graded Bund	2015-16	21.859	86.096
62	Karanjia	Dudhiani	Ranipat	Ranipat	LBCD	2016-17	21.859	86.097
63	Karanjia	Dudhiani	Ranipat	Ranipat	Compound wall	2013-14	21.850	86.069
64	Karanjia	Dudhiani	Ranipat	Kiajahari	Forest Guard Quarter	2015-16	21.835	86.133
65	Karanjia	Dudhiani	Tato	Tato	Range Office	2011-12	21.847	86.017
66	STR	Chahala	Chahala	Chahala	Salt lick	2015-16	21.971	86.279
67	STR	Chahala	Chahala	Chahala	Surface Dyke	2016-17	21.985	86.288
68	STR	Chahala	Chahala	Chahala	Causeway	2016-17	21.985	86.288
69	STR	Chahala	Bareipani	Bareipani	Forester Residence cum Office	2013-14	21.941	86.362
70	STR	Chahala	Chahala	Kar Kachia	Elephant Trench	2015-16	21.981	86.356
71	STR	Chahala	Chahala	Chahala	De-weeding Meadow development	2015-16	21.967	86.193
72	STR	Chahala	Chahala	Kar Kachia	Forest Guard Quarter	2015-16	21.848	86.356
73	STR	Chahala	Chahala	Chahala	New meadow development	2016-17	21.975	86.296
74	STR	Chahala	Chahala	Chahala	Forest Road	2016-17	21.975	86.195
75	STR	Chahala	Chahala	Chahala	Salt Lick	2015-16	21.984	86.293
76	STR	Chahala	Chahala	Chahala	Elephant Trench	2015-16	21.985	86.293
77	STR	Chahala	Chahala	Chahala	Ranger Quarter	2015-16	21.986	85.292
78	STR	Chahala	Chahala	Chahala	VHF House	2015-16	21.986	86.293
79	STR	Chahala	Chahala	Chahala	Solar electrification of FRH	2016-17	21.853	86.293
80	STR	Jenabil	Gurundia	Hatighara	Seed Plot	2015-16	21.733	86.349
81	STR	Jenabil	Gurundia	Hatighara	Elephant Trench	2013-14	21.733	86.349

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
82	STR	Upper Barakamuda	Kandhadhenu	Kandhadhenu	Section office	2015-16	21.694	86.197
83	STR	Upper Barakamuda	Upper Barakamuda	Meghasani	Forest Guard Quarter	2010-11	21.637	86.355
84	STR	Upper Barakamuda	Upper Barakamuda	Upper Barakamuda	Meadow	2016-17	21.648	86.302
85	STR	Upper Barakamuda	upper Barakamuda	Mathughar	Elephant Trench	2016-17	21.627	86.304
86	STR	Upper Barakamuda	upper Barakamuda	Mathughar	Watch tower	2016-17	21.627	86.304
87	STR	Upper Barakamuda	upper Barakamuda	Mathughar	Meadow management & weed eradication	2016-17	0.000	0.000
88	STR	Upper Barakamuda	Patbil	Bengapani	Meadow management	Every year	21.654	86.283
89	STR	Upper Barakamuda	Patbil	Tinadita	WHS	2011-12	21.670	86.281
90	STR	Upper Barakamuda	Patbil	Tinadita	Water Body	2011-12	21.670	86.281
91	STR	Upper Barakamuda	Upper Barakamuda	Upper Barakamuda	Range Office	2010-11	21.651	86.300
92	STR	Upper Barakamuda	Upper Barakamuda	Upper Barakamuda	salt lick	2015-16	0.000	0.000
93	STR	Jenabil	Jenabil	Jenabil	Forest Road	2012-13	21.735	86.360
94	STR	Jenabil	Gurundia	Hatighara- I	Barrack	2013-14	21.733	86.349
95	STR	Jenabil	Gurundia	Hatighara- I	Malkhana	2013-14	21.733	86.349
96	STR	Jenabil	Jenabil	Jenabil	Officer Camp	2016-17	21.735	86.361
97	STR	Jenabil	Jenabil	Jenabil	Elephant Trench	2016-17	21.735	86.361
98	STR	Jenabil	Jenabil	Jenabil	Cross drainage	2016-17	21.736	86.360
99	STR	Jenabil	Jenabil	Kulipal	Forest Guard Quarter	2016-17	21.725	86.418
100	STR	Jenabil	Jenabil	Son pokhari-I	Anti-poaching Camp	2013-14	21.749	86.447



Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
101	STR	Jenabil	Jenabil	Son pokhari-I	Elephant Trench	2014-15	21.749	86.447
102	STR	Jenabil	Tiktali	Sarua	Weed eradication	2015-16	21.684	86.397
103	STR	Jenabil	Tiktali	Sarua	Meadow	2013-14	21.684	86.397
104	STR	Jenabil	Jenabil	Jenabil	Meadow	2014-15	21.728	86.360
105	STR	Jenabil	Jenabil	Jenabil	Watch tower	2015-16	21.728	86.360
106	STR	Jenabil	Gurundia	Hatighara	Causeway	2012-13	21.736	86.355
107	Baripada	Dukura	Tadaki	Chandanchaturi	Forest Guard Quarter	2012-13	21.835	86.591
108	Baripada	Dukura	Digdiga	Sanakeraka	Forester Quarter cum Office	2012-13	22.345	86.682
109	Baripada	Dukura	Digdiga	Sanakeraka	Water Body	2012-13	21.874	86.657
110	Baripada	Dukura	Tadaki	Dukura	Range Office	2012-13	22.501	86.844
111	Baripada	Bangiriposi	Badagaan	Badagaan	Water Body	2013-14	21.997	86.523
112	Baripada	Bangiriposi	Badagaan	Badagaan	Forester Quarter	2013-14	21.997	86.523
113	Baripada	Deuli	Suliapada	Kantisaahi	Water Body	2014-15	22.023	86.978
114	Baripada	Deuli	Deuli	Deuli	Ranger's Residence	2016-17	22.037	86.818
115	Baripada	Bangiriposi	Badagaan	Bangiriposi	Range Office	2010-11	22.023	86.539
116	Baripada	Bangiriposi	Badagaan	Bangiriposi	Ranger's Residence	2015-16	22.152	86.539
117	Baripada	Bangiriposi	Sirsa	Inka	Forest Guard Quarter	2015-16	22.271	30.410
118	Balasore WL	Jaleswar	Baradiha	Kendukhunta	Water Body	2013-14	21.876	87.105
119	Balasore WL	Jaleswar	Baradiha	Sukhijhudi	Forester quarter cum office	2016-17	21.901	87.166
120	Balasore WL	Jaleswar	Udaypur	Khadibil	Forest Guard Quarter	2016-17	21.592	87.418
121	Balasore WL	Jaleswar	Udaypur	NM Padia	Fish bone channel	2012-13	21.595	87.420
122	Balasore WL	Jaleswar	Jaleswar	Jaleswar	Barrack	2012-13	21.816	87.233
123	Balasore WL	Jaleswar	Jaleswar	Jaleswar	VHF Tower	2012-13	21.816	87.233
124	Balasore WL	Jaleswar	Jaleswar	Jaleswar	Range Office	2011-12	21.816	87.233
125	Balasore WL	Jaleswar	Jaleswar	Jaleswar	Forest Guard Quarter	2012-13	21.816	87.233
126	Balasore WL	Jaleswar	Jaleswar	Jaleswar	Ranger's Quarter	2016-17	21.816	87.233
127	Balasore WL	Jaleswar	Jaleswar	Jaleswar	Anti poaching Gate	2014-15	21.764	87.159
128	Balasore WL	Nilgiri	Nilgiri	Nilgiri	Forester Quarter	2012-13	21.463	86.775

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
129	Balasore WL	Nilgiri	Nilgiri	Nilgiri	Seizure Yard	2011-12	21.463	86.774
130	Balasore WL	Jaleswar	Jaleswar	Jaleswar	Barrack	2012-13	21.463	86.774
131	Balasore WL	Nilgiri	Nilgiri	Nilgiri	Range Office	2012-13	21.463	86.775
132	Balasore WL	Nilgiri	Mitrapur	Mitrapur	Water Body	2016-17	21.542	87.629
133	Balasore WL	Nilgiri	Sajanagada	Sajanagada	Elephant Trench	2015-16	21.488	86.691
134	Balasore WL	Nilgiri	Sajanagada	Naranapur	Forest Guard Quarter	2012-13	21.517	86.699
135	Balasore WL	Kuldiha	Panchaligeswar	Panchaligeswar	Forest Guard Quarter	2011-12	21.410	86.727
136	Balasore WL	Kuldiha	Panchaligeswar	Panchaligeswar	Water Body	2011-12	21.412	86.717
137	Balasore WL	Kuldiha	Panchaligeswar	Thenda	Causeway	2012-13	21.449	86.684
138	Balasore WL	Kuldiha	Panchaligeswar	Thenda	Solar Fencing	2011-12	21.455	86.699
139	Balasore WL	Kuldiha	Kuldiha	Kuldiha-II	Forest Road	2016-17	21.436	86.645
140	Balasore WL	Kuldiha	Kuldiha	Kuldiha-II	Anti poaching Gate	2014-15	21.425	86.609
141	Balasore WL	Kuldiha	Jodachua	Balianala	VHF Tower	2015-16	21.436	86.605
142	Balasore WL	Kuldiha	Jodachua	Balianala	Elephant Trench	2016-17	21.436	86.606
143	Balasore WL	Kuldiha	Kuldiha	Kuldiha-II	Check Dam	2016-17	21.416	86.522

## XII. Geo Tagging of Sampled out other than Plantation activities under Bhubaneswar Circle

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
1	Chandaka WL	Chandaka WL	Kantabada	Kantabada	WHS-1	2015-16	20.338	85.720
2	Chandaka WL	Chandaka WL	Godibali	Godibali	WHS-2	2016-17	20.331	85.732
3	Chandaka WL	Chandaka WL	Godibari	Godibari	Water Body Creation	2016-17	20.331	85.732
4	Chandaka WL	Chandaka WL	Godibari	Godibari	WHS	2016-17	20.333	85.733
5	Chandaka WL	Chandaka WL	Godibali	Godibari	Forest Road Repair (Godibali to Kumarkhunti)	every year	20.342	85.719
6	Chandaka WL	Chandaka WL	Kantabada	Jhumka	Water Body	2014-15	20.331	85.727
7	Chandaka WL	Chandaka WL	Kantabada	Jhumka	Salt Lick Maintenance	every year	20.338	85.720
8	Chandaka WL	Chandaka WL	Godibari	Bhola	Culvert with stone patching		20.365	85.702
9	Chandaka WL	Chandaka WL	Godibari	Bhola	Causeway		20.364	85.713
10	Chandaka WL	Chandaka WL	Chandaka	Kumarkhunti	VHF maintenance	every year	20.369	85.768
11	Chandaka WL	Chandaka WL	Chandaka	Baranga	Malkhana	2013-14	20.413	85.819
12	Chandaka WL	Chandaka WL	Godibari	Godibari	Maintenance of Elephant Trench	every year	20.331	85.732
13	Chandaka WL	Chandaka WL	Godibali	Bhola	Forest Guard Quarter	2012-13	20.340	85.737
14	Chandaka WL	Chandaka WL	Chandaka WL	Chandaka WL	Range office	2012-13	20.487	85.768
15	Chandaka WL	Bhubaneswar WL	Bharatpur	Bharatpur	Anti Poaching Gate	2010-11	20.321	85.790
16	Chandaka WL	Bhubaneswar WL	Bharatpur	Bharatpur	Watch Tower	2014-15	20.331	85.798
17	Chandaka WL	Bhubaneswar WL	Bhubaneswar	Bhubaneswar	Seizure Yard	2011-12	20.286	85.795
18	Chandaka WL	Bhubaneswar WL	Bhubaneswar	Bhubaneswar	Barrack	2012-13	20.286	85.794
19	Chandaka WL	Bhubaneswar WL	Bhubaneswar	Bhubaneswar	Forester Quarter	2015-16	20.286	85.794
20	Chandaka WL	Bhubaneswar WL	Bhubaneswar	Bhubaneswar	Forest Guard Quarter	2015-16	20.286	85.794
21	Chandaka WL	Dampara WL	Bhagipur	Gayalbanka	Culvert	2016-17	20.397	85.695
22	Chandaka WL	Dampara WL	Dampada	Pithakhia	Water body creation	2011-12	20.359	85.673
23	Chandaka WL	Dampara WL	Dampada	Pithakhia	Fruit bearing plantation around water body	2014-15	20.359	85.673
24	Chandaka WL	Chandaka WL	Chandaka	Kumarkhunti	Rescue operation centre	2016-17	20.369	85.768
25	Chandaka WL	Bhubaneswar WL	Bhubaneswar	Bhubaneswar	Nursery	2011-12	20.282	85.770



Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
26	Chandaka WL	Chandaka WL	Chandaka	Kumarkhunti	Forest Protection squad	every year		0.000
27	Chandaka WL	Dampara WL	Talabasta	Kumarkhunti	Forester Quarter	2013-14	20.342	85.594
28	Chandaka WL	Dampara WL	Talabasta	Kumarkhunti	Meadow development	2014-15	20.331	85.638
29	City Forest	Mancheswar	Cuttack East	Sagadi Patna	Forest Guard Quarter	2012-13	20.378	86.083
30	City Forest	Mancheswar	Cuttack East	Odapada	Forest Guard Quarter	2012-13	20.425	86.066
31	City Forest	Mancheswar	Rasulgarh	Rasulgarh	Boundary wall	2015-16	20.295	85.951
32	City Forest	Mancheswar	Rasulgarh	Rasulgarh	Common Toilet	2016-17	20.295	85.850
33	City Forest	Bhubaneswar	Khandagiri west	Patrapada	Forester Quarter	2015-16	20.243	85.766
34	City Forest	Bhubaneswar	Khandagiri west	Patrapada	Range office	2011-12	20.243	85.766
35	City Forest	Bhubaneswar	Khandagiri west	Patrapada	Barrack	2012-13	20.243	85.766
36	City Forest	Bhubaneswar	Khandagiri west	Patrapada	Malkhana	2012-13	20.243	85.766
37	City Forest	Bhubaneswar	Khandagiri east	Deulipatna	Boundary wall	2012-13	20.251	85.758
38	City Forest	Bhubaneswar	Khandagiri east	Deulipatna	FG Quarter	2012-13	20.251	85.758
39	Puri	Konark	Konark	Konark	Laterite Boundary wall	2013-14	19.889	86.100
40	Puri	Konark	Konark	Konark	Central Nursery	2013-14	19.875	86.090
41	Puri	Konark	Konark	Konark	Culvert	2012-13	19.856	86.059
42	Puri	Konark	Ramchandi	Kapileswar	water Body	2016-17	19.864	86.044
43	Puri	Konark	Konark	Konark	Barrack	2012-13	19.889	86.091
44	Puri	Konark	Konark	Konark	VHF Tower	2015-16	19.889	86.091
45	Puri	Konark	Konark	Konark	Range Office	2011-12	19.889	86.091
46	Puri	Gop	Gop	Gop	Common Toilet	2012-13	19.971	86.024
47	Puri	Gop	Nimapada	Nimapada	Central Nursery	2014-15	20.065	86.037
48	Puri	Gop	Nimapada	Nimapada	Forest Guard Quarter	2015-16	20.066	86.037
49	Puri	Gop	Nimapada	Nimapada	Forester Quarter	2015-16	20.066	86.037
50	Puri	Gop	Gop	Gop	Range Office	2012-13	19.971	86.024

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
51	Puri	Konark	Konark	Konark	Boundary wall	2013-14	19.862	86.095
52	Puri	Konark	Konark	Konark	Meadow development	2013-14	19.866	86.111
53	Puri	Konark	Konark	Konark	Fabricated protection shed	2014-15	19.862	86.095
54	Puri	Konark	Konark	Konark	Culvert (vented)	2013-14	19.876	86.103
55	Puri	Konark	Konark	Konark	Nursery shed road	2013-14	19.876	86.103
56	Puri	Balukhand	Balukhand	Balukhand	Nursery shed	2013-14	19.833	85.876
57	Puri	Balukhand	Balukhand	Balukhand	Meadow development	2014-15	19.825	85.859
58	Puri	Balukhand	Balukhand	Balukhand	Malkhana	2012-13	19.830	85.863
59	Puri	Balukhand	Balukhand	Balukhand	Forester Quarter	2012-13	19.825	85.865
60	Puri	Balukhand	Balukhand	Balukhand	Forest Guard Quarter	2012-13	19.825	85.865
61	Puri	Balukhand	Balukhand	Balukhand	Protection shed	2016-17	19.825	85.865
62	Puri	Balukhand	Balukhand	Balukhand	Barrack	2012-13	19.824	85.864
63	Puri	Balukhand	Balukhand	Balukhand	Range Office	2012-13	19.824	85.864
64	Puri	Balukhand	Balukhand	Balukhand	Seizure yard	2011-12	19.824	85.864
65	Puri	Balukhand	Balukhand	Phulpatana	Road maintenance	Every Year	19.836	85.893
66	Puri	Balukhand	Balukhand	Phulpatana	Protection shed	2014-15	19.842	85.901
67	Puri	Balukhand	Balukhand	Phulpatana	Compound wall	2015-16	19.835	85.884
68	Puri	Gop	Gop	Gop	Compound wall	2014-15	19.971	86.024
69	Bhadrak	Chandbali	Chandbali	Chandbali	Forest Guard quarter	2011-12	20.772	86.739
70	Bhadrak	Chandbali	Chandbali	Chandbali	Jetty Dock wall	2011-12	20.772	86.739
71	Bhadrak	Chandbali	Karanjamal	Karanjamal	Forest Guard quarter	2012-13	20.887	86.913
72	Bhadrak	Chandbali	Karanjamal	Karanjamal	Forest Guard quarter	2012-13	20.887	86.913
73	Bhadrak	Chandbali	Chandbali	Chandbali	Para Staff	2015-16		0.000
74	Bhadrak	Bhadrak	Agarpada	Agarpada	Forester Residence cum Office	2012-13	21.207	86.362

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
75	Bhadrak	Bhadrak	Agarpada	Agarpada	Antipoachingsquad for elephant movement	Every Year		
76	Bhadrak	Bhadrak	Agarpada	Agarpada	Forest Guard quarter	2012-13	21.207	86.362
77	Bhadrak	Bhadrak	Agarpada	Agarpada	Antipoaching shed	2012-13	21.206	86.362
78	Bhadrak	Bhadrak	Agarpada	Agarpada	Boundary wall with gate	2013-14	21.206	86.362
79	Bhadrak	Dham Nagar	DhamNagar	Dham Nagar	Barrack for Antipoachingsquad	2016-17	20.978	86.437
80	Bhadrak	Dham Nagar	DhamNagar	Dham Nagar	Range Office	2012-13	20.928	86.437
81	Bhadrak	Dham Nagar	DhamNagar	Dham Nagar	Forester quarter	2013-14	20.928	86.437
82	Bhadrak	Dham Nagar	DhamNagar	Dhobal	Forest Guard quarter	2013-14	20.928	86.437
83	Bhadrak	Dham Nagar	DhamNagar	Dhobal	Compound wall	2013-14	20.928	86.437
84	Bhadrak	Dham Nagar	DhamNagar	Dhobal	Common toilet	2013-14	20.928	86.437
85	Bhadrak	Dham Nagar	DhamNagar	Dham Nagar	Antipoachingsquad	2014-15		0.000
86	Chilika	Tangi	Tangi	Tangi	Range Office	2012-13	19.930	85.397
87	Chilika	Tangi	Tangi	Tangi	FG quarter	2016-17	19.896	85.397
88	Chilika	Tangi	Tangi	Tangi	Malkhana	2012-13	19.930	85.397
89	Chilika	Tangi	Tangi	Tangi	Common toilet	2012-13	19.930	85.397
90	Chilika	Tangi	Mukteswar	Mangala Jodi	Watch Tower	2016-17	20.387	85.432
91	Chilika	Rambha	Sorana	Sunakhala	FG quarter	2015-16	19.834	85.283
92	Chilika	Rambha	Keshpur	Keshpur	FG quarter	2012-13	19.603	85.115
93	Chilika	Rambha	Keshpur	Keshpur	FG quarter	2010-11	19.603	85.115
94	Chilika	Rambha	Rambha	Rambha	FG quarter	2015-16	19.549	85.090
95	Chilika	Rambha	Rambha	Rambha	Malkhana	2013-14	19.557	85.090
96	Chilika	Rambha	Rambha	Rambha	Tube well	2013-14	19.549	85.090
97	Chilika	Rambha	Pitisa	Nandal	FG quarter	2015-16	19.485	85.175
98	Chilika	Rambha	Pitisa	Nandal	Water body	2015-16	19.485	85.175



Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
99	Chilika	Rambha	PitisaI	PitisaI	Forester quarter	2016-17	19.516	85.217
100	Chilika	Rambha	Keshpur	Keshpur	Watch Tower	2016-17	19.613	85.124
101	Chilika	Satapada	Satapada	Satpada	Residence of Ranger	2016-17	19.666	85.440
102	Chilika	Balugaon	Parikud	Parikud	Forest Guard quarter	2013-14	19.661	85.263
103	Chilika	Satapada	Satapada	Satpada	Forest Guard quarter	2016-17	19.533	85.440
104	Chilika	Satapada	Satapada	Satpada	Forest Guard quarter(Dolphin)	2016-17	19.533	85.440
105	Chilika	Satapada	Satapada	Satpada	Forest Guard quarter	2016-17	19.666	85.440
106	Chilika	Satapada	Satapada	Manikpatna	Forest Guard quarter, Manikpatna	2012-13	19.823	85.522
107	Rajnagar	Kanika	Dangamal	Dangamal	Anti poaching Squad	Every Year		
108	Rajnagar	Kanika	Dangamal	Bhitarkanika	Anti depredation squad	Every Year		
109	Rajnagar	Kanika	Dangamal	Bhitarkanika	Maintenance of Forest Road	2015-16	20.495	86.740
110	Rajnagar	Kanika	Kanika	Kanika	Maintenance of Forest Road	2014-15	20.495	86.740
111	Rajnagar	Kanika	Bhitarkanika	Bhitarkanika	Maintenance of Water Body	2009-10	20.717	86.868
112	Rajnagar	Kanika	Kanika	Kanika	Trail Road		20.703	86.866
113	Rajnagar	Kanika	Bhitarkanika	Bhitarkanika	Creation of Water Body	2014-15	20.712	86.862
114	Rajnagar	Kanika	Bhitarkanika	Bhitarkanika	Culvert	2011-12	20.712	86.867
115	Rajnagar	Kanika	Dangamal	Dangamal	Forester Quarter	2012-13	20.743	86.867
116	Rajnagar	Kanika	Dangamal	Dangamal	Ticket counter cum watch shed	2009-10	20.744	86.867
117	Rajnagar	Kanika	Talachuan	Kalibhajadia	Jetty	2009-10	20.774	86.927
118	Rajnagar	Kanika	Talachuan	Talachuan	Forester Quarter	2016-17	20.762	86.942
119	Rajnagar	Kanika	Dangamal	Dangamal	G I Fencing	2012-13	20.744	86.867

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
120	Rajnagar	Gahirmatha	Ekakula	Ekakula	Anti Poaching squad	Every Year		0.000
121	Rajnagar	Gahirmatha	Barunei	Sasanpetta	Residence of forester	2013-14	20.496	86.740
122	Rajnagar	Gahirmatha	Sasanpeta	Sasanpeta	Barrack	2012-13	20.495	86.741
123	Rajnagar	Gahirmatha	Gahirmatha	Sasanpeta	Seizure Yard	2012-13	20.495	86.741
124	Rajnagar	Rajnagar	Satavaya	Satavaya	Watcher Shed	2009-10	20.618	86.897
125	Rajnagar	Rajnagar	Satavaya	Satavaya	FG quarter	2015-16	20.640	83.441
126	Rajnagar	Mahakal Pada	Batighara	Batighara	Boundary wall	2013-14	20.329	86.737
127	Rajnagar	Mahakal Pada	Batighara	Batighara	FG quarter	2013-14	20.330	86.736
128	Rajnagar	Mahakal Pada	Jambu	Jambu	Forest Barrack	2012-13	20.352	86.730
129	Rajnagar	Mahakal Pada	Jagat Jore	Jagat Jore	Forester quarter	2016-17	20.464	86.684
130	Rajnagar	Mahakal Pada	Jagat Jore	Jagat Jore	Boundary wall	2016-17	20.464	86.684
131	Khordha	Ranpur	Betuli	Betuli	Cause way	2016-17	19.951	85.193
132	Khordha	Ranpur	Korodegula	Bhetabara	Watch tower	2011-12	20.006	85.267
133	Khordha	Ranpur	Ranpur	Ranpur	Range office	2012-13	20.054	85.339
134	Khordha	Ranpur	Korodegula	Bhetabara	Culvert	2010-11	19.989	85.239
135	Khordha	Khordha	Bologarh	Patabandha	Forest guard quarter	2013-15	20.221	85.309
136	Khordha	Tangi	Bhusandpur	Rameswar	Forest guard quarter	2016-17	20.001	85.502
137	Khordha	Ranpur	Betuli	Betuli	Culvert	2013-14	19.952	85.194
138	Khordha	Ranpur	Korodapal	Bhetabara	FG Quarter	2010-11	20.006	85.267
139	Khordha	Ranpur	Korodapal	Bhetabara	Barrack	2011-12	20.006	85.267
140	Khordha	Ranpur	Korodapal	Bhetabara	Check gate	2010-11	20.006	85.267
141	Khordha	Ranpur	Korodapal	Bhetabara	Boundary wall	2012-13	20.007	85.267
142	Khordha	Ranpur	Korodapal	Sankhajodi	Water body	2012-13	19.972	85.224
143	Khordha	Tangi	Tangi	Tangi	Central Nursery	2013-	19.937	85.389
144	Khordha	Tangi	Tangi	Tangi	Ranger Residence	2012-13	19.929	85.396

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
145	Khordha	Tangi	Tangi	Tangi	FG Quarter	2012-13	19.929	85.397
146	Nayagarh	Mahipur	Mahitama	Jiginipada	Water body at Hatimunda RF	2013-14	20.257	84.999
147	Nayagarh	Mahipur	Mahipur	Sampada	Mega Nursery	2013-14	20.221	84.976
148	Nayagarh	Mahipur	Mahipur	BanuaSahi	Forest Guard Quarter	2012-13	20.149	85.003
149	Nayagarh	Mahipur	Mahipur	Gateri	Solar fencing	2014-15	20.127	84.961
150	Nayagarh	Mahipur	Mahipur	Gateri	Causeway	2012-13	20.111	84.984
151	Nayagarh	Mahipur	Mahipur	Gateri	Forest Road	2012-13	20.111	84.984
152	Nayagarh	Mahipur	Mahipur	Gateri	Culvert	2013-14	20.107	84.987
153	Nayagarh	Mahipur	Mahitama	Nuagarh	Malkhana	2010-11	20.283	84.958
154	Nayagarh	Mahipur	Mahitama	Koradi	Boundary Wall	2015-16	20.272	84.957
155	Nayagarh	Mahipur	Mahipur	Mahipur	Forester Quarter	2013-14	20.164	84.995
156	Nayagarh	Mahipur	Mahipur	Mahipur	VHF tower	2016-17	20.164	84.995
157	Nayagarh	Mahipur	Mahipur	Mahipur	Range Office Building	2012-13	20.164	84.995
158	Nayagarh	Odagaon	Odagaon	Kadamjhar	Forest Road	2015-16	19.969	84.956
159	Nayagarh	Odagaon	Odagaon	Kadamjhar	Causeway	2015-16	19.969	84.956
160	Nayagarh	Odagaon	Odagaon	Kadamjhar	Forest guard Quarter	2015-16	20.076	84.915
161	Nayagarh	Odagaon	Odagaon	Odagaon	Common Toilet	2012-13	20.017	84.981
162	Nayagarh	Odagaon	Odagaon	Odagaon	Ranger Residence	2015-16	20.017	84.981
163	Nayagarh	Odagaon	Odagaon	Odagaon	Range office	2010-11	20.017	84.981
164	Nayagarh	Khandapada	Kantilo	Rakesia	Water Body	2014-15	20.339	85.140
165	Nayagarh	Khandapada	Kantilo	Banapur	Forester quarter		20.362	85.169
166	Nayagarh	Khandapada	Singapada	Nuapalli	Forester guard quarter	2014-15	20.288	85.090
167	Nayagarh	Khandapada	Khandapada	Khandapada	Range officer quarter	2012-13	20.269	85.174
168	Nayagarh	Khandapada	Khandapada	Khandapada	Range Office	2012-13	20.266	85.174



### XIII. Geo Tagging of Sampled out other than Plantation activities under Bhawanipatna Circle

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
1	Khariar	Khariar	KHARIAR	KHARIAR	RANGE OFFICE	2013-14	20.560	82.842
2	Khariar	Khariar	KHARIAR	KHARIAR	MALKHANA	2009-10	20.304	82.776
3	Khariar	Khariar	SANAMAHESWAR	JHOLAPATHAR	FOREST BEAT HOUSE	2012-13	20.497	82.939
4	Khariar	Khariar	SANAMAHESWAR	JHOLAPATHAR	FORESTER'S RESIDENCE	2012-13	20.499	82.938
5	Khariar	Khariar	RANIMUNDA	KHARABADI	FOREST GUARD QUARTER	2016-17	20.327	82.914
6	Khariar	KOMNA	KOMNA	KOMNA	RANGE OFFICER'S QUARTER	2013-14	20.585	82.770
7	Khariar	KOMNA	RAJANA	CHHATA	CENTRAL NURSARY	2013-14	20.611	82.672
8	Khariar	NUAPADA	LAKHNA	AINALJJABA	WATERBODY	2012-13	20.853	82.711
9	Khariar	NUAPADA	NUAPADA	NUAPADA	Ranger quarter	2012-13	20.999	82.544
10	Khariar	NUAPADA	NUAPADA	NUAPADA	BARRACK	2012-13	20.944	82.899
11	SONEPUR	ULUNDA	ULUNDA	DHULDHULA	WATERBODY	2013-14	21.107	83.970
12	SONEPUR	ULUNDA	SINDHOL	S.PATHARAPALLI	ELEPHANT FOOT TRENCH	2016-17	21.373	83.948
13	SONEPUR	ULUNDA	ULUNDA	ULUNDA	RANGE OFFICER'S QUARTER	2014-15	21.106	84.078
14	SONEPUR	ULUNDA	ULUNDA	ULUNDA	Forster's office cum residence	2014-15	21.103	84.074
15	SONEPUR	ULUNDA	ULUNDA	ULUNDA	MALKHANA	2014-15	21.101	84.083
16	SONEPUR	ULUNDA	ULUNDA	ULUNDA	BARRACK	2014-15	21.100	84.086
17	SONEPUR	BIRAMAHARAJPUR	DHURDHURA	DHURDHURA	NURSERY SHED	2010-11	21.087	84.232
18	SONEPUR	BIRAMAHARAJPUR	DHURDHURA	DULESWAR	FOREST GUARD QUARTER	2013-14	21.078	84.307
19	SONEPUR	BIRAMAHARAJPUR	DHURDHURA	DULESWAR	FORESTER'S RESIDENCE	2012-13	21.076	84.280
20	SONEPUR	BIRAMAHARAJPUR	SUBALAYA	SERGADA	WATERBODY	2014-15	21.015	84.295
21	SONEPUR	BIRAMAHARAJPUR	BIRAMARAJPUR	BIRAMARAJPUR	RANGE OFFICER'S QUARTER	2013-14	21.045	84.199
22	SONEPUR	BIRAMAHARAJPUR	BIRAMARAJPUR	BIRAMARAJPUR	RANGE OFFICE	2011-12	21.043	84.196
23	SONEPUR	BIRAMAHARAJPUR	BIRAMARAJPUR	BIRAMARAJPUR	BARRACK	2012-13	21.044	84.202
24	SONEPUR	BIRAMAHARAJPUR	BIRAMARAJPUR	BIRAMARAJPUR	MALKHANA	2012-13	21.042	84.203
25	SUNABEDA WILDLIFE	KOMNA	SILATPANI	SILATPANI	WATER BODY	2014-15	20.720	82.622
26	SUNABEDA WILDLIFE	KOMNA	SILATPANI	SILATPANI	WAREMESS FENCING	2016-17	20.839	82.636

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
27	SUNABEDA WILDLIFE	KOMNA	SILATPANI	SILATPANI	ANTI-POACHING SHED	2012-13	20.685	82.599
28	SUNABEDA WILDLIFE	KOMNA	CHERCHUAN	CHERCHUAN	GATE OPERATING HOUSE	2014-15	20.572	82.611
29	SUNABEDA WILDLIFE	KOMNA	CHERCHUAN	CHERCHUAN	EARTHEN BOND	2016-17	20.626	82.728
30	SUNABEDA WILDLIFE	KOMNA	KOMNA	KOMNA	RANGE OFFICE	2012-13	20.487	82.723
31	SUNABEDA WILDLIFE	KOMNA	KOMNA	KOMNA	BARRACK	2012-13	20.487	82.724
32	SUNABEDA WILDLIFE	KOMNA	KOMNA	KOMNA	MALKHANA	2012-13	20.486	82.732
33	SUNABEDA WILDLIFE	SUNABWDA	SUSENGA	JOLMUDI	NURSERY SHED	2012-13	20.726	82.656
34	SUNABEDA WILDLIFE	SUNABWDA	SUSENGA	JOLMUDI	SEIZURE YARD	2012-13	20.728	82.658
35	SUNABEDA WILDLIFE	SUNABWDA	SUSENGA	JOLMUDI	WATER BODY	2016-17	20.740	82.659
36	SUNABEDA WILDLIFE	SUNABWDA	SUSENGA	JOLMUDI	MEDOW DEVELOPMENT	2016-17	20.646	82.543
37	SUNABEDA WILDLIFE	SUNABWDA	SUSENGA	SUSENGA	EARTHEN GRADED BOND	2016-17	20.736	82.683
38	SUNABEDA WILDLIFE	NUAPADA	DHARAMUNDA	PANDEIPANI	CULVERT	2015-16	20.783	82.535
39	SUNABEDA WILDLIFE	NUAPADA	DHARBANDHA	ADARA	WATER BODY	2015-16	20.703	82.524
40	SUNABEDA WILDLIFE	NUAPADA	KATINGPANI	BHAUSIL	CAUSEWAY	2015-16	20.724	82.529

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
41	SUNABEDA WILDLIFE	NUAPADA	NUAPADA	NUAPADA	BARRACK	2012-13	20.920	82.789
42	SUNABEDA WILDLIFE	NUAPADA	NUAPADA	NUAPADA	MALKHANA	2011-12	20.920	82.794
43	SUNABEDA WILDLIFE	NUAPADA	NUAPADA	NUAPADA	FOREST RANGE OFFICE	2011-12	20.915	82.786
44	SUNABEDA WILDLIFE	NUAPADA	SIBANARAY-ANPUR	JHALRAMA	SALT LICK	2016-17	20.847	82.487
45	Kalahandi South	Karlapata	Sagada	Sagada	Forest Guard quarter	2016-17	19.804	83.117
46	Kalahandi South	Karlapata	Sagada	Sagada	Malkhana	2011-12	19.804	83.117
47	Kalahandi South	Karlapata	Sagada	Sagada	Antipoachingsquad	Every year		
48	Kalahandi South	Karlapata	Sagada	Sagada	VHF Tower	2016-17	19.804	83.117
49	Kalahandi South	Karlapata	Sagada	Sagada	Antipoachingsquad	Every year		
50	Kalahandi South	Karlapata	Sagada	Sagada	Forest Guard quarter	2013-14	19.782	83.114
51	Kalahandi South	Karlapata	Sagada	Jakam	LBCD in SagadaNala	2016-17	19.747	83.109
52	Kalahandi South	Karlapata	Sagada	Jakam	Check Dam	2016-17	19.749	83.110
53	Kalahandi South	Karlapata	Sagada	Jakam	Wooden Brize	2016-17	19.747	83.109
54	Kalahandi South	Karlapata	Sagada	Jakam	Forest Road	2016-17	19.746	83.109
55	Kalahandi South	Karlapata	Sagada	Jakam	Water Body	2014-15	19.746	83.109
56	Kalahandi South	Karlapata	Sagada	Jakam	Salt Lick	2016-17	19.745	83.110
57	Kalahandi South	Karlapata	Sagada	Jakam-A	Meadow Development	2016-17	19.726	83.118
58	Kalahandi South	Karlapata	Jakam	Jakam-A	CC Road	2012-13	19.737	83.112
59	Kalahandi South	Th. Rampur(N)	Saisurini	Saisurini	Range office	2016-17	19.609	83.137
60	Kalahandi South	Th. Rampur(N)	Saisurini	Saisurini	Residence of Ranger	2016-17	19.609	83.138



Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
61	Kalahandi South	Th. Rampur(N)	Saisurini	Saisurini	Malkhana	2013-14	19.609	83.138
62	Kalahandi South	Th. Rampur(S)	Saisurini	Saisurini	Range office	2011-12	19.538	82.930
63	Kalahandi South	Th. Rampur(S)	Saisurini	Saisurini	Staff Barak	2012-13	19.538	82.930
64	Kalahandi South	Th. Rampur(S)	Saisurini	Saisurini	Boundary wall	2012-13	19.538	82.930
65	Kalahandi South	Th. Rampur(S)	Saisurini	Saisurini	Forester Quarter	2012-13	19.538	82.930
66	Kalahandi South	Th. Rampur(S)	Th. Rampur	Th. Rampur	Sacred Groves	2016-17	19.526	82.915
67	Kalahandi South	Th. Rampur(S)	Th. Rampur	Th. Rampur	Earthen Bund	2016-17	19.526	82.915
68	Kalahandi South	Jaipatna	Benakhman	Mahulpatna	Forester Quarter	2016-17	19.526	82.915
69	Kalahandi South	Jaipatna	Benakhman	Mahulpatna	Forest Guard quarter	2015-16	19.410	82.905
70	Kalahandi South	Jaipatna	Benakhman	Mahulpatna	Boundary wall	2016-17	19.410	82.905
71	Kalahandi South	Jaipatna	Benakhman	Mahulpatna	Tube well	2016-17	19.410	82.872
72	Kalahandi South	Jaipatna	Jaipatna	Jaipatna	Malkhana	2010-11	19.472	82.811
73	Kalahandi South	Jaipatna	Jaipatna	Jaipatna	Common Toilet	2012-13	19.472	82.811
74	Kalahandi North	Biswanathpur	Biswanathpur	Biswanathpur	Sacred Groves	2015-16	19.475	82.684
75	Kalahandi North	Kesinga	RupraRoad	Gigina	Causeway	2011-12	20.213	83.329
76	Kalahandi North	Kesinga	RupraRoad	Gigina	Forest Road	2016-17	20.213	83.329
77	Kalahandi North	Kesinga	RupraRoad	Gigina	Culvert	2016-17	20.219	83.323
78	Kalahandi North	Kesinga	Kesinga	Kesinga	Range office	2016-17	20.189	83.221
79	Kalahandi North	Kesinga	Kesinga	Kesinga	Forest Guard quarter	2016-17	20.189	83.221
80	Kalahandi North	Kesinga	Kesinga	Kesinga	Residence of Ranger	2016-17	20.189	83.222
81	Kalahandi North	Bhawanipatna	Bhawanipatna	Purunapada	Range office	2012-13	19.915	83.193
82	Kalahandi North	Bhawanipatna	Bhawanipatna	Bhawanipatna	Para Staff	2012-13		
83	Kalahandi North	Bhawanipatna	Bhawanipatna	Purunapada	Barak	2012-13	19.915	83.193
84	Kalahandi North	Bhawanipatna	Bhawanipatna	Purunapada	Common Toilet	2012-13	19.915	83.193
85	Kalahandi North	Bhawanipatna	Sanpur	Sanpur	Forester Quarter	2013-14	19.951	83.345

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
86	Kalahandi North	Bhawanipatna	Sanpur	Sanpur	Forest Guard quarter	2012-13	19.951	83.345
87	Kalahandi North	Bhawanipatna	Sanpur	Burat	Water Body	2013-14	20.025	83.326
88	Kalahandi North	Bhawanipatna	Bhawanipatna	Sirliguda	Mega Nursery	2012-13 to 14-15	19.846	83.141
89	Balangir	Harisankar	Khaprakhol	Khaprakhol	Range office	2012-13	20.751	82.860
90	Balangir	Harisankar	Khaprakhol	Khaprakhol	Forest Guard quarter	2012-13	20.751	82.860
91	Balangir	Harisankar	Khaprakhol	Khaprakhol	Residence of Ranger	2012-13	20.751	82.860
92	Balangir	Harisankar	Khaprakhol	Khaprakhol	Seizure yard	2012-13	20.751	82.860
93	Balangir	Harisankar	Khaprakhol	Khaprakhol	Zoo management	2010-11 to 16-17	20.850	82.863
94	Balangir	Harisankar	Khaprakhol	Nandupada	Culvert	2012-13	21.416	83.435
95	Balangir	Harisankar	Khaprakhol	Nandupada	Forest Road	2016-17	21.416	83.435
96	Balangir	Patnagarh	Patnagarh	Goelmunda	Water Body	2013-14	20.618	83.159
97	Balangir	Patnagarh	Bandhapada	Bandhapada	Forest Guard quter	2013-14	20.594	83.246
98	Balangir	Patnagarh	Bandhapada	Bandhapada	Boundary wall	2013-14	20.594	83.246
99	Balangir	Patnagarh	Bandhapada	Desand	Causeway	2012-13	20.565	83.180
100	Balangir	Patnagarh	Bandhapada	Desand	Forest Road	2016-17	20.565	83.179
101	Balangir	Balangir	Balangir-I	Balangir-II	Water Body	2014-15	20.683	83.785
102	Balangir	Balangir	Balangi-I	Balangir-II	Mega Nursery	2012-13 to 2016-17	20.677	83.457
103	Balangir	Balangir	Balangi-I	Dhuamura	Sect rate groves	2015-16	21.196	83.721

#### XIV. Geo Tagging of Sampled out other than Plantation activities under Koraput Circle

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
1	Koraput	Koraput	Podagarh	Janiguda	Water body	2011-12	18.858	82.823
2	Koraput	Koraput	Koraput	Koraput	Range Office	2012-13	18.841	82.703
3	Koraput	Koraput	Koraput	Koraput	Central Nursery	2013-14	18.822	82.682
4	Koraput	Koraput	Koraput	Koraput	Common Toilet	2015-16	18.824	82.709
5	Koraput	Koraput	Koraput	Koraput	Barrack	2013-14	18.824	82.709
6	Koraput	Simliguda	Simliguda	Simliguda	Ranger Quarter	2014-15	19.538	82.845
7	Koraput	Simliguda	Simliguda	Simliguda	Forester Quarter cum office	2014-15	18.705	82.845
8	Koraput	Simliguda	Simliguda	Simliguda	Range Office	2010-11	18.705	82.844
9	Koraput	Simliguda	Simliguda	Kunduli	F.G Quarter	2016-17	18.598	82.905
10	Koraput	Simliguda	Simliguda	Simliguda	Water body	2014-15	18.675	82.888
11	Koraput	Balda	Balda	Balda	Range Office	2014-15	18.441	82.679
12	Koraput	Balda	Padua	Balda	Forester Quarter cum office	2013-14	18.374	82.680
13	Koraput	Balda	Padua	Balda	F.G Quarter	2013-14	18.374	82.713
14	Koraput	Balda	Padua	Bhimdul	Water body	2015-16	18.729	83.209
15	Jeypore	Baipariguda	Baipariguda	Baipariguda	F.G Quarter	2015-16	18.750	82.431
16	Jeypore	Baipariguda	Baipariguda	Baipariguda	F.G Quarter	2016-17	18.752	82.434
17	Jeypore	Baipariguda	Baipariguda	Baipariguda	Range Office	2012-13	18.751	82.430
18	Jeypore	Baipariguda	Baipariguda	Baipariguda	Range Office	2015-16	18.734	82.426
19	Jeypore	Baipariguda	Dashmantpur	Dashmantpur	EPA Well	2009-10	18.663	82.440
20	Jeypore	Jeypore	Patraput	Dimala	F.G Quarter	2012-13	18.838	82.558
21	Jeypore	Jeypore	Patraput	Dimala	Barrack	2012-13	18.858	82.579
22	Jeypore	Jeypore	Patraput	Dimala	Ranger Quarter	2012-13	19.859	82.579
23	Jeypore	Jeypore	Jaynagar	Kuntakhal	Water Body	2014-15	18.847	82.536
24	Jeypore	Jeypore	Jeypore	Naktidangara	Boundary Wall	2015-16	20.201	83.913
25	Jeypore	Boriguma	Boriguma	Borigama	Forester Quarter cum office	2014-15	19.057	82.537
26	Jeypore	Boriguma	Boriguma	Borigama	F.G Quarter	2014-15	19.057	82.537



Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
27	Jeypore	Boriguma	Boriguma	Borigama	Barrack	2013-14	19.057	82.537
28	Jeypore	Boriguma	Boriguma	Dimala	Range Office	2011-12	19.052	82.520
29	Jeypore	Jeypore	Patraput	Dimala	F.G Quarter	2012-13	18.838	82.558
30	Jeypore	Jeypore	Patraput	Patraput	F.G Quarter	2012-13	18.838	82.558
31	Jeypore	Boriguma	Kalhaguda	Baipariguda	Barrack	2012-13	18.858	82.579
32	Jeypore	Baipariguda	Baipariguda	Papadhandi	F.G Quarter	2016-17	18.752	82.434
33	Nabarangpur	Nabarangpur	Papadhandi	BeraJharan	Deer Park	2016-17	19.707	82.353
34	Nabarangpur	Nabarangpur	Tumbarla	Podagarah	Water body	2013-14	19.442	82.513
35	Nabarangpur	Umarkot	Dharra	Umarkot	F.G Quarter	2013-14	19.603	82.253
36	Nabarangpur	Umarkot	Umerkot	Umarkot	F.G Quarter	2010-11	19.666	82.204
37	Nabarangpur	Umarkot	Umerkot	Umerkot	Range Office	2010-11	19.666	82.204
38	Nabarangpur	Umarkot	Singisari	Malgada	F.G Quarter	2012-13	19.504	82.168
39	Nabarangpur	Umarkot	Umerkot	Umarkot	Barrack	2012-13	19.666	82.204
40	Nabarangpur	Nabarangpur	Nabarangpur	Nabarangpur	Malkhana	2012-13	19.543	82.538
41	Nabarangpur	Nabarangpur	Nabarangpur	Nabarangpur	Range Office	2013-14	19.269	82.521
42	Nabarangpur	Nabarangpur	Nabarangpur	Forest Guard Quarter	F.G Quarter	2012-13	19.277	82.538
43	Nabarangpur	Dabugam	Dabugam	Dabuga	Malkhana	2012-13	19.546	82.410
44	Nabarangpur	Dabugam	Dabugam	Sarguli	F.G Quarter	2013-14	19.456	82.410
45	Nabarangpur	Dabugam	Dabugam	Jhaliguda	water body	2013-14	19.491	82.543
46	Malkangiri	Balimela	Somnathpur	Somnathpur	Forest road	2013-14	18.312	82.136
47	Malkangiri	Balimela	Balimela	Orkil	Range Office	2012-13	18.235	82.065
48	Malkangiri	Balimela	Balimela	Orkil	Water Facility (Syntax)	2013-14	18.235	82.065
49	Malkangiri	Balimela	Balimela	Orkil	Nursery Fencing	2014-15	18.230	82.086
50	Malkangiri	Balimela	Balimela	Orkil	Watcher Shed	2014-15	18.230	82.086

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
51	Malkangiri	Balimela	Somnathpur	Somnathpur	Causeway	2013-14	18.312	82.131
52	Malkangiri	Balimela	Balimela	Orkil	Common toilet	2013-14	18.235	82.065
53	Malkangiri	Balimela	Balimela	Orkil	Seizure Yard	2013-14	18.235	82.065
54	Malkangiri	Balimela	Balimela	Orkil	F.G Quarter	2011-12	18.235	82.065
55	Malkangiri	Mathili	Gobindpuri	Gobindpuri	Water body	2016-17	18.558	82.273
56	Malkangiri	Mathili	Gobindpalli	Gobindpalli	Range Office	2013-14	0.000	0.000
57	Malkangiri	Mathili	Gobindpalli	Gobindpalli	Culvert	2016-17	18.599	82.280
58	Malkangiri	Malkhangiri	Malkhangiri	Malkhangiri	Range Office	2010-11	18.393	81.894
59	Malkangiri	Malkhangiri	Malkhangiri	Malkhangiri	Barrack	2012-13	18.352	81.894
60	Malkangiri	Malkhangiri	Padmagiri	Akru	F.G Quarter	2011-12	18.494	81.915
61	Malkangiri	Malkhangiri	pandripani	Padripani	Causeway	2012-13	18.481	81.990
62	Malkangiri	Malkhangiri	Padripani	Padripani	Culvert	2012-13	18.481	81.990
63	Malkangiri	Malkhangiri	Padripani	Padripani	Culvert	2012-13	18.484	81.994
64	Rayagada	Rayagada	Rayagada	Rayagada	Range Office	2012-13	19.178	83.391
65	Rayagada	Rayagada	Rayagada	Rayagada	Common Toilet	2012-15	19.178	83.391
66	Rayagada	Rayagada	Rayagada	Rayagada	Barrack	2012-16	19.178	83.391
67	Rayagada	Rayagada	Rayagada	Rayagada	F.G Quarter	2011-12	19.178	83.391
68	Rayagada	Rayagada	Rayagada	Rayagada	Ranger Quarter	2012-18	19.178	83.391
69	Rayagada	Rayagada	Rayagada	Rayagada	Forester Quarter cum office	2012-13	19.178	83.391
70	Rayagada	Rayagada	Rayagada	Rayagada	Seizure Yard	2012-13	19.178	83.391
71	Rayagada	Rayagada	Rayagada	Rayagada	Tube Well	2012-13	19.178	83.391
72	Rayagada	Rayagada	Rayagada	Rayagada	Boundary Wall	2011-12	19.178	83.391
73	Rayagada	Muniguda	Muniguda	Khudliga	Water Body	2014-15	19.688	83.492
74	Rayagada	Muniguda	Muniguda	Khudliga	Mega Nursery	2013-14	19.618	83.473
75	Rayagada	Gunpur	Gunpur	Gunpur	Range Office	2016-17	19.102	83.806

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
76	Rayagada	Gunpur	Gunpur	Gunpur	Forester Quarter cum office	2012-13	19.102	83.806
77	Rayagada	Gunpur	Gunpur	Gunpur	Seizure Yard	2012-13	19.102	83.806
78	Rayagada	Gunpur	Gunpur	Gunpur	Forester Quarter cum office	2013-13	19.102	83.806
79	Rayagada	Gunpur	Gunpur	Gunpur	Tube Well	2013-14	19.102	83.806
80	Rayagada	Gunpur	Gunpur	Gunpur	Watcher Shed	2013-14	19.102	83.806
81	Rayagada	Rayagada	Gumma	Gumma	F.G Quarter	2013-14	19.193	83.286
82	Rayagada	Rayagada	Gumma	Gumma	F.G Quarter	2013-14	19.193	83.286



## XV. Geo Tagging of Sampled out other than Plantation activities under Rourkela Circle

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
1	Deograh	Reamal	Rengalbada	Gundiapali	Forest Road	2013-14	21.447	84.737
2	Deograh	Reamal	Rengalbada	Rengalbada	Forester office cum Residence	2011-12	21.450	84.689
3	Deograh	Reamal	Rengalbada	Rengalbada	Forest Guard Quarter	2010-11	21.450	84.689
4	Deograh	Reamal	Rengalbada	Gundiapali	Forest Guard Quarter	2015-16	21.450	84.689
5	Deograh	Reamal	Rengalbada	Gundiapali	Water Body	2014-15	21.451	84.733
6	Deograh	Reamal	Remal	Taranga	Permanent nursery Shed	2013-14	21.328	84.657
7	Deograh	Barkot	Kalla	Saida	Scared Groves	2016-17	21.514	85.093
8	Deograh	Pallahara	Pallahara	Sergarh	Seizure Yard	2012-13	21.448	85.193
9	Deograh	Barkot	Pallahara	Batisuan	Forest Guard Quarter	2013-14	21.388	85.151
10	Deograh	Barkot	Thianal	Thianal	Water Body	2016-17	21.494	85.105
11	Deograh	Barkot	Thianal	Thianal	Saltlick	2015-16	21.494	85.104
12	Deograh	Barkot	Thianal	Thianal	Elephant Trench	2016-17	21.488	85.112
13	Keonjhar	Champua	Champua	Champua	Range Office	2010-11	22.067	85.668
14	Keonjhar	Champua	Bamebari	Kalimati	Forester office cum Residence	2009-10	21.868	85.404
15	Keonjhar	Champua	Bamebari	Nayagarh	Forest Guard Quarter	2016-17	21.868	85.404
16	Keonjhar	Champua	Champua	Champua	Boundary wall	2010-11	22.067	85.668
17	Deograh	Champua	Bamebari	Malda	Watcher Shed	2016-17	21.844	85.422
18	Keonjhar	Ghatagaon	Ghatagaon	Ghatagaon	Water Body	2016-17	21.382	85.868
19	Deograh	Ghatagaon	Ghatagaon	Ghatagaon	Staff Barrack	2012-13	21.396	85.896
20	Bonei	Bonei	Bonei	Bonei	Range office	2012-13	21.821	84.952
21	Bonei	Bonei	Bonei	Bonei	Seizure Yard	2013-14	21.830	84.946
22	Bonei	Tamda	Saplat	Tumbei	Earthen check dam	2015-16	21.879	84.732
23	Bonei	Tamda	Saplat	Jamardihi	Scared Groves	2015-16	21.948	84.766
24	Bonei	Tamda	Gurundia	Madhupur	Solar Fencing	2014-15	21.831	84.748
25	Bonei	Tamda	Gurundia	Gurundia	Seizure Yard	2011-12	21.850	84.785
26	Bonei	Tamda	Bhaludunguri	Bhaludunguri	Malkhana	2012-13	21.850	84.785

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
27	Bonei	Tamda	Gurundia	Gurundia	RangerResidence	2013-14	21.850	84.785
28	Bonei	Tamda	Gurundia	Gurundia	Forester office cum Residence	2012-13	21.850	84.785
29	Bonei	Tamda	Gurundia	Gurundia	Forest Guard Quarter	2012-13	21.850	84.785
30	Bonei	Tamda	Gurundia	Gurundia	Boundary wall	2015-16	21.850	84.785
31	Bonei	Tamda	Bhaludunguri	Bhaludunguri	Upgraded Nursery	2014-15 & 15-16	21.841	84.859
32	Bonei	Sole	Mahuldiha	Sirgida	Causeway	2013-14	22.033	84.626
33	Rourkela	Bisra	Khiratola	Khiratola	Forest Guard Quarter	2012-13	22.324	85.008
34	Rourkela	Bisra	Khiratola	Khiratola	Forester office cum Residence	2013-14	22.332	85.009
35	Rourkela	Bisra	Bisra	Bisra	Nursery Shed	2013-14	22.247	84.998
36	Rourkela	Bisra	Bisra	Bisra	Range office	2013-14	22.249	84.995
37	Rourkela	Bisra	Bisra	Bisra	Staff Barrack	2012-13	21.249	84.995
38	Rourkela	Bisra	Bisra	Bisra	Checkgate	2013-14	22.249	84.990
39	Rourkela	Kuanrmunda	Kuanrmunda	Garjan	Forest Road	2009-10 to 2013-14	22.179	84.790
40	Rourkela	Kuanrmunda	Kuanrmunda	Balanda	Labour shed	2011-12	22.185	84.782
41	Rourkela	Kuanrmunda	Kuanrmunda	Kuanrmunda	Elephant Trench	2013-14	22.271	84.775
42	Rourkela	Rajgangpur	Rajgangpur	Lima	Mega Nursery	2013-14 to 2015-16	22.270	84.637
43	Sundargarh	Hemgiri	Kodabahal	Kendudihi	Forest Guard Quarter	2015-16	21.967	83.640
44	Sundargarh	Kuanrmunda	Kuanrmunda	Kuanrmunda	Forest Road	2009-10 to	22.179	84.790
45	Sundargarh	Hemgiri	Kodbahal	Kendudihi	Boundary wall	2015-16	21.967	83.640
46	Sundargarh	Hemgiri	Kodbahal	Kendudihi	Forest Guard Quarter	2015-16	21.967	83.640
47	Sundargarh	Hemgiri	Kodbahal	Kendudihi	Forester office cum Residence	2013-14	21.967	83.640

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
48	Sundargarh	Hemgiri	Kodbahal	Kodbahal	Saltlick	2015-16	21.968	83.644
49	Sundargarh	Hemgiri	Kodbahal	Kodbahal	Water Body	2015-16	21.980	83.641
50	Sundargarh	Hemgiri	Dohara	Purna	Scared Groves	2016-17	21.867	83.641
51	Sundargarh	Hemgiri	Puruna	Purna	Solar Fencing	2016-17	22.366	83.641
52	Sundargarh	Gopalpur	Gopalpur	Tikinipada	Causeway	2016-17	22.109	83.590
53	Sundargarh	Gopalpur	Turia	Jamkani	Culvert	2016-17	22.108	83.585
54	Sundargarh	Gopalpur	Tihuria	Bhagarkachhar	Forest Guard Quarter	2016-17	22.108	83.585
55	Sundargarh	Ujalpur	Tihuria	Jamkani	Range office	2012-13	22.084	83.594
56	Sundargarh	Ujalpur	Ujalpur	Ujalpur	Mega Nursery	2012-13	22.082	83.909
57	Sundargarh	Ujalpur	Ujalpur	Tasaladihi	Scared Groves	2014-15	22.104	83.967



## XVI. Geo Tagging of Sampled out other than Plantation activities under Sambalpur Circle

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
1	Jharsuguda	Brajarajnagar	Rajpur	Chandrimal	Mega Nursery	2014-15	21.906	83.919
2	Jharsuguda	Brajarajnagar	Rajpur	Rajpur	Water Body at Rajpur	2013-14	21.865	83.872
3	Jharsuguda	Brajarajnagar	Bandhbahal	Bandhbahal	Forester Quarter	2013-14	21.757	83.870
4	Jharsuguda	Brajarajnagar	Bandhbahal	Bandhbahal	Forest Guard Quarter	2013-14	21.757	83.870
5	Jharsuguda	Brajarajnagar	Brajarajnagar	Amdhara	Culvert	2013-14	21.875	83.922
6	Jharsuguda	Jharsuguda	Jharsuguda	Jharsuguda	Bird bath	2015-16	21.874	84.055
7	Jharsuguda	Jharsuguda	Jharsuguda	Jharsuguda	Water Body at Maleimunda VF	2013-14	21.860	84.067
8	Jharsuguda	Belpahar	Belpahar	Belpahar	Range officer's residence	2016-17	21.830	83.846
9	Jharsuguda	Belpahar	Bhikampali	Deopali	Water body at Deopali	2016-17	21.828	83.596
10	Jharsuguda	Belpahar	Bhikampali	Machida	Solar fencing	2016-17	21.837	83.622
11	Jharsuguda	Belpahar	Bagmunda	Bhaurkhul	Causeway	2015-16	21.784	83.729
12	Sambalpur	Rengali	Bhalubahal	Pardesipali	Water body-Pitapali	2013-14	21.609	84.079
13	Sambalpur	Rengali	Pardesipali	Sangramala	Elephant Trench	2016-17	21.527	84.208
14	Sambalpur	Rengali	Gumloi	Gumloi	Forest Guard Quarter	2016-17	21.542	84.110
15	Sambalpur	Rengali	Sardapali	Sardapali	Watch Tower	2013-14	21.666	84.145
16	Sambalpur	Rengali	Rengali	Rengali	Range office	2012-13	21.637	84.044
17	Sambalpur	Rengali	Rengali	Rengali	Culvert	2014-15	21.723	84.140
18	Sambalpur	Rengali	Sardapali	Sardapali	Staff Barrack	2012-13	21.613	84.152
19	Sambalpur	Rengali	Sardapali	Sardapali	VHF Tower	2014-15	21.613	84.152
20	Sambalpur	Rengali	Rengali	Rengali	Culvert	2013-14	21.728	84.237
21	Sambalpur	Dhama	Dhama	Dhama	Range Office	2011-12	21.260	83.923
22	Sambalpur	Dhama	Dhama	Dhama	Range Officer's Residence	2013-14	21.277	83.923
23	Sambalpur	Dhama	Dhama	Dhama	Forest Guard Quarter	2010-11	21.277	83.923
24	Sambalpur	Dhama	Dhama	Dhama	Forester Quarter	2012-13	21.277	83.923
25	Sambalpur	Dhama	Dhama	Dhama	Seizure Yard	2013-14	21.260	83.923
26	Sambalpur	Dhama	Deogaon	Deogaon	Sacrad Groves at Deogaon RF	2015-16	21.271	84.075

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
27	Sambalpur	Dhama	Deogaon	Deogaon	Tube Well at Deogaon RF	2015-16	21.231	84.126
28	Sambalpur	Dhama	Larasara	Larasara	Forest Guard Quarter	2011-12	21.192	83.913
29	Sambalpur	Dhama	Larasara	Larasara	Tube well at Hitech Nursery	2014-15	21.192	83.913
30	Sambalpur	Dhama	Larasara	Larasara	Anti Poaching Shed	2013-14	21.167	83.900
31	Sambalpur	Dhama	Larasara	Larasara	Anti Poaching Check Gate	2013-14	21.192	83.913
32	Sambalpur	Sambalpur Sadar	Sambalpur Sadar	Sambalpur Sadar	Forest Range Office	2010-11	21.479	84.000
33	Sambalpur	Sambalpur Sadar	Sambalpur Sadar	Sambalpur Sadar	Common Toilet	2013-14	21.479	84.000
34	Sambalpur	Sambalpur Sadar	Basiapada	Basiapada	Anti Poaching Check Gate Shed	2014-15	21.293	84.486
35	Sambalpur	Sambalpur Sadar	Basiapada	Basiapada	Labour shed at Permanent Nursery	2015-16	21.355	84.659
36	Sambalpur	Sambalpur Sadar	Basiapada	Basiapada	Forest Guard Quarter	2015-16	21.718	84.226
37	Sambalpur	Sambalpur Sadar	Basiapada	Basiapada	Water Body	2015-16	21.179	84.166
38	Rairakhol	Badbahal	Badbahal	Podabalanda	Elephant proof trench	2016-17	21.044	84.282
39	Rairakhol	Charmal	Charmal	Charmal	Ranger's residence with boundary wall	2015-16	21.112	84.214
40	Rairakhol	Badmal	Mochibahal	Mochibahal	Water Body maintenance at Landakota	2016-17	21.161	84.165
41	Rairakhol	Badmal	Mochibahal	Mochibahal	Barrack	2012-13	21.163	84.164
42	Rairakhol	Badmal	Mochibahal	Mochibahal	Tube Well	2010-11	21.163	84.164
43	Rairakhol	Badmal	Mochibahal	Saiberni	Water Body creation at Satasama PRF	2016-17	21.147	84.135
44	Rairakhol	Badmal	Badmal	Badmal	Common toilet	2012-13	21.105	84.068
45	Rairakhol	Badmal	Badmal	Badmal	Watch tower	2014-15	21.082	84.082
46	Rairakhol	Badmal	Badmal	Badmal	Salt Lick	2014-15	21.083	84.081

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
47	Rairakhol	Badmal	Badmal	Badmal	SMC	2009-10	21.110	84.075
48	Rairakhol	Naktideul	Naktideul	Naktideul	Upgraded Nursery at Penthabahal	2013-14	21.227	84.506
49	Rairakhol	Naktideul	Naktideul	Naktideul	Range office	2010-11	21.250	84.537
50	Rairakhol	Naktideul	Naktideul	Naktideul	VHF Tower at range office	2014-15	21.250	84.537
51	Rairakhol	Naktideul	Batogaon	Hitasara	Forester Quarter	2013-14	21.240	84.656
52	Rairakhol	Naktideul	Jamjuri	Chadchadi	Forest Guard Quarter	2015-16	21.190	84.733
53	Rairakhol	Naktideul	Jamjuri	Chadchadi	Causeway	2013-14	21.212	84.683
54	Rairakhol	Naktideul	Jamjuri	Chadchadi	Forest Road maintenance Naktideul- Chadchadi	2013-14	21.212	84.683
55	Rairakhol	Rairakhol	Rampur	Rampur	Seizure Yard-Dimrikuda	2009-10	21.085	84.371
56	Rairakhol	Rairakhol	Rairakhol	Rairakhol	Motorcycle	2011-12	0.000	0.000
57	Rairakhol	Rairakhol	Rairakhol	Rairakhol	Malkhana	2015-16	21.069	84.340
58	Rairakhol	Rairakhol	Rairakhol	Rairakhol	Fire Line at Hatidhara RF compartment- 10	2016-17	21.073	84.438
59	Rairakhol	Rairakhol	Rairakhol	Rairakhol	Sacrad Grooves at Baishnabajhuli	2015-16	21.066	84.432
60	Rairakhol	Rairakhol	Luhapank	Luhapank	Forester Quarter	2015-16	21.071	84.405
61	Rairakhol	Rairakhol	Luhapank	Luhapank	Fruit bearing plantation near water body at Hatidhara RF	2014-15	21.091	84.408
62	Rairakhol	Rairakhol	Burda	Burda	Watch tower at Badmal	2016-17	21.122	84.323
63	Rairakhol	Rairakhol	Rairakhol	Rairakhol	Elephant proof trench at Kholgarh RF	2011-12	21.110	84.348
64	Rairakhol	Rairakhol	Rairakhol	Rairakhol	Elephant proof trench at Jharpada	2013-14	21.102	84.350
65	Bargarh	Ghess	Sohela	Kudopali	Permanent nursery	2011-12	21.304	83.409
66	Bargarh	Ghess	Diptipur	Jhamkar	Water Body	2016-17	21.093	83.111
67	Bargarh	Ghess	Diptipur	Jhamkar	Sacrad Grooves- Banadurga (Halkadar)	2015-16	21.092	83.111
68	Bargarh	Ghess	Ghess	Ghess	Seizure Yard	2009-10	21.195	83.290
69	Bargarh	Ghess	Ghess	Ghess	Forest Guard Quarter	2011-12	21.195	83.290



Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
70	Bargarh	Ghess	Ghess	Ghess	Common toilet	2011-12	21.195	83.290
71	Bargarh	Ghess	Ghess	Ghess	Residence of Range Officer	2016-17	21.195	83.290
72	Bargarh	Paikmal	Paikmal	Saramsil	Diaphragam wall at Adhual PRF	2015-16	21.048	82.856
73	Bargarh	Paikmal	Paikmal	Saramsil	Earthen bund	2015-16	21.048	82.856
74	Bargarh	Paikmal	Paikmal	Saramsil	LBS	2015-16	21.062	82.800
75	Bargarh	Paikmal	Paikmal	Paikmal	Range office	2012-13	20.918	82.816
76	Bargarh	Paikmal	Paikmal	Paikmal	Residence of Range officer	2014-15	20.918	82.815
77	Bargarh	Paikmal	Jharbandh	Jharbandh	Forester Quarter cum office	2012-13	21.068	82.792
78	Bargarh	Paikmal	Paikmal	Saramsil	Water Body-PaikmalAdhual PRF	2016-17	21.064	82.861
79	Bargarh	Paikmal	Paikmal	Saramsil	Fire Line	2016-17	21.063	82.861
80	Bargarh	Paikmal	Paikmal	Saramsil	Culvert at Chuhapali to Suklipahar forest road	2012-13	21.058	82.858
81	Bargarh	Paikmal	Paikmal	Saramsil	Causeway at Chuhapali to Suklipahar Forest Road	2016-17	21.058	82.857
82	Bargarh	Paikmal	Paikmal	Saramsil	Para Staff	Every year	0.000	0.000
83	Bargarh	Paikmal	Paikmal	Saramsil	Elephant Tracker	Every year	0.000	0.000
84	Bargarh	Paikmal	Paikmal	Saramsil	Fire Fighting Squad	Every year	0.000	0.000
85	Bamra WL	Khalasuni	Khalasuni	Khalasuni	Range office	2016-17	21.326	84.349
86	Bamra WL	Khalasuni	Khalasuni	Khalasuni	Forester Quarter	2016-17	21.326	84.349
87	Bamra WL	Khalasuni	Khalasuni	Khalasuni	Common toilet at range office	2013-14	21.326	84.349
88	Bamra WL	Khalasuni	Khalasuni	Khalasuni	Barrack boundary	2015-16	21.326	84.349
89	Bamra WL	Khalasuni	Upermunda	Pendrakhhol	Forest Guard Quarter	2015-16	21.298	84.526
90	Bamra WL	Khalasuni	Khalasuni	Mandumam	Forest check gate with watcher shed and Tube well at Pitabalikhaman	2016-17	21.309	84.478
91	Bamra WL	Khalasuni	Khalasuni	Pendrakhhol	Salt lick at Haldiadhara	2016-17	21.323	84.480
92	Bamra WL	Khalasuni	Khalasuni	Mandumam	SMC- Graded Bund	2016-17	21.317	84.451

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
93	Bamra WL	Khalasuni	Khalasuni	Manduum	LBCD	2016-17	21.318	84.451
94	Bamra WL	Khalasuni	Khalasuni	Manduum	Diaphragam wall-1	2016-17	21.319	84.451
95	Bamra WL	Jamankira	Bhojpur	Sirid	Nursery shed	2012-13	21.634	84.447
96	Bamra WL	Jamankira	Bhojpur	Sirid	Forest Road	2016-17	21.616	84.504
97	Bamra WL	Jamankira	Bhojpur	Sirid	Causeway-1	2011-12	21.616	84.504
98	Bamra WL	Jamankira	Bhojpur	Sirid	Causeway-2	2012-13	21.629	85.517
99	Bamra WL	Kuchinda	Kuchinda	Kuchinda	Malkhana	2009-10	21.751	84.352
100	Bamra WL	Jamankira	Bhojpur	Bhojpur	Forester quarter	2016-17	21.652	84.403
101	Bamra WL	Jamankira	Bhojpur	Bhojpur	Forest Guard quarter	2013-14	21.652	84.403
102	Bamra WL	Jamankira	Bhojpur	Bhojpur	Common Toilet	2012-13	21.652	84.403
103	Bamra WL	Jamankira	Bhojpur	Bhojpur	Seizure yard	2016-17	21.652	84.403
104	Bamra WL	Kuchinda	Kuchinda	Kuchinda	Range office	2012-13	21.751	84.353
105	Bamra WL	Kuchinda	Kuchinda	Kuchinda	Staff Barrack and bore well	2012-13	21.750	84.353
106	Bamra WL	Kuchinda	Kuchinda	Kuchinda	VHF tower	2016-17	21.750	84.353
107	Bamra WL	Kuchinda	Kuchinda	Kuchinda	Ranger's Residence	2015-16	21.751	84.352
108	Bamra WL	Kuchinda	Kuchinda	Kuchinda	Boundary wall	2015-16	21.751	84.352
109	Bamra WL	Kuchinda	Kuchinda	Kuchinda	Forester Quarter	2016-17	21.751	84.352
110	Bamra WL	Kuchinda	Kusumi	Laidaguda	Forest Guard Quarter	2012-13	21.747	84.447
111	Bamra WL	Kuchinda	Kusumi	Laidaguda	Boundary wall	2012-13	21.747	84.447
112	Bamra WL	Kuchinda	Kusumi	Laidaguda	Tube well	2012-13	21.747	84.447
113	Bamra WL	Kuchinda	Badbahal	Rengali	Water Body at Ekaguda	2014-15	21.709	84.505
114	Bamra WL	Bamra WL	Garposh WL	Garposh WL	Forest Guard Quarter	2013-14	21.709	84.505
115	Bamra WL	Bamra WL	Garposh WL	Garposh WL	Forester Quarter	2013-14	21.709	84.505
116	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Stand up barrier	2015-16	21.473	83.994
117	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Extension of height of enclosure	2012-13	21.473	83.994

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
118	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Concrete seal along wire mesh	2012-13	21.473	83.994
119	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Masonry drain extended from 1st gate to 2nd gate of zoo	2012-13	21.473	83.994
120	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Range office	2012-13	21.473	83.994
121	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Solar light (10 sets)	2011-12	21.473	83.994
122	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Construction of boundary enclosure along two sides of gate	2013-14	21.472	83.993
123	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Fixing of paver block on road	2012-13	21.473	83.994
124	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Fixing of paver block on road	2013-14	21.473	83.994
125	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Boundary wall extension	2009-10	21.473	83.994
126	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Construction of signage (2 nos)	2013-14	21.473	83.994
127	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Shed for barking deer	2012-13	21.473	83.994
128	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Stand up barrier	2013-14	21.473	83.994
129	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Circular enclosure for Block-1	2013-14	21.473	83.994
130	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Circular enclosure for Block-2	2013-14	21.473	83.994
131	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Circular enclosure for Block-3	2014-15	21.473	83.994
132	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Circular enclosure for Block-4	2015-16	21.473	83.994
133	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Over head tank over circular enclosure	2015-16	21.473	83.994
134	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Steel railing infront of aquarium and 2nd gate	2012-13	21.473	83.994
135	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Steel wire enclosure for bird	2012-13	21.473	83.994
136	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Pump house of two storeyed	2012-13	21.473	83.994
137	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	2nd gate for leopard	2012-13	21.473	83.994
138	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Construction of roof of drinking water facility	2013-14	21.473	83.994
139	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Foot bath infront of every cage	2015-16	21.473	83.994



Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
140	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Boundary enclosure of mud house between forest & zoo	2012-13	21.473	83.994
141	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Road drain	2009-10	21.473	83.994
142	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Rescue shed enclosure	2012-13	21.473	83.994
143	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Tiling of rescue center	2012-13	21.473	83.994
144	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Culvert no. 2	2010-11	21.471	83.991
145	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Culvert no. 3	2011-12	21.471	83.990
146	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Post Mortum house	2009-10	21.470	83.991
147	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Quarentine room	2009-10	21.471	83.991
148	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Animal health care center	2011-12	21.471	83.991
149	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Compound wall of post mortem house	2009-10	21.471	83.991
150	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Partition enclosure between sambar & wild boar	2015-16	21.471	83.991
151	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Construction of shed for sambar	2012-13	21.471	83.991
152	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Construction of water tank	2011-12	21.471	83.991
153	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	CCTV of 10 nos.	2014-15	21.471	83.991
154	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	CCTV of 6 nos.	2015-16	21.471	83.991
155	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Water tank for duck and swan	2016-17	21.471	83.991
156	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Construction of chairs for children park	2016-17	21.471	83.991
157	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Construction of fountain	2012-13	21.471	83.991
158	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Tiling of rest shed	2011-12	21.471	83.991
159	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Sign board construction	2014-15	21.471	83.991
160	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Vehicle shed, garage and store room	2010-11	21.471	83.991
161	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Purchase of equipments like fire blower & pressure washer	2014-15	21.471	83.991

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
162	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Purchase of equipments like grass cutter & tree cutter	2016-17	21.471	83.991
163	Hirakud WL	Sambalpur	Sambalpur	Sambalpur	Purchase of computer for range office	2009-10	21.471	83.991
164	Hirakud WL	Kamgaon	Kamgaon	Kamgaon	Forester Quarter	2012-13	21.448	83.636
165	Hirakud WL	Kamgaon	Kamgaon	Kamgaon	Forest Guard Quarter	2012-13	21.448	83.636
166	Hirakud WL	Kamgaon	Kamgaon	Kamgaon	Check dam	2016-17	21.500	83.854
167	Hirakud WL	Kamgaon	Kamgaon	Kamgaon	Water harvesting structure	2016-17	21.500	83.854
168	Hirakud WL	Kamgaon	Dhodrukusum	Rengali	Elephant proof trench	2015-16	21.484	83.764
169	Hirakud WL	Kamgaon	Ghodukusum	Rujenmal	Watch tower	2015-16	21.493	83.724
170	Hirakud WL	Kamgaon	Kamgaon	Lanjipalli	Anti poaching check gate quarter	2015-16	21.488	83.661
171	Hirakud WL	Kamgaon	Kamgaon	Lanjipalli	Forest Guard Quarter	2013-14	21.497	83.654
172	Hirakud WL	Kamgaon	Dhodrukusum	Dhodrukusum	Water body	2012-13	21.528	83.760
173	Hirakud WL	Kamgaon	Dhodrukusum	Dhodrukusum	Salt Leak	2012-13	21.529	83.774
174	Hirakud WL	Kamgaon	Dhodrukusum	Dhodrukusum	Salt Leak	2012-13	21.531	83.770
175	Hirakud WL	Kamgaon	Chaurasimala	Mundamoula	Forest Guard Quarter	2013-14	21.547	83.754
176	Hirakud WL	Kamgaon	Kamgaon	Kamgaon	Watcher shed	2013-14	21.547	83.754
177	Hirakud WL	Kamgaon	Chaurasimala	Mundamari	Water Body-Subgiridi	2012-13	21.554	83.753
178	Hirakud WL	Kamgaon	Dhodrukusum	Rengali	Range office- Hirakud range	2012-13	21.502	83.772
179	Hirakud WL	Kamgaon	Dhodrukusum	Rengali	Range office- Kamgaon range	2012-13	21.502	83.772
180	Hirakud WL	Kamgaon	Dhodrukusum	Rengali	Forest Guard Quarter	2012-13	21.471	83.991
181	Hirakud WL	Kamgaon	Dhodrukusum	Rengali	Residence of forest range officer- kamgaon	2016-17	21.501	83.771
182	Hirakud WL	Kamgaon	Dhodrukusum	Rengali	Forest Guard Quarter	2009-10	21.501	83.771
183	Hirakud WL	Kamgaon	Dhodrukusum	Rengali	Forest Guard Quarter	2009-10	21.502	83.771
184	Hirakud WL	Kamgaon	Dhodrukusum	Rengali	FG shed	2009-10	21.502	83.771

Sl. No.	Division	Range	Section	Beat	Type of Assets	APO year	Latitude	Longitude
185	Hirakud WL	Kamgaon	Chaurasimala	Parvatitang	Causeway	2012-13	21.596	83.733
186	Hirakud WL	Kamgaon	Chaurasimala	Parvatitang	Anti poaching shed	2013-14	21.604	83.730
187	Hirakud WL	Kamgaon	Chaurasimala	Parvatitang	Solar fencing	2015-16	21.604	83.730
188	Hirakud WL	Kamgaon	Chaurasimala	Parvatitang	Watch tower	2016-17	21.604	83.730
189	Hirakud WL	Kamgaon	Chaurasimala	Parvatitang	Trail road	2015-16	21.586	83.718
190	Hirakud WL	Kamgaon	Chaurasimala	Chaurasimala	Elephant trench	2013-14	21.592	83.693
191	Hirakud WL	Lakhanpur	Jhagadabehera	Jhagadabehera	Meadow development patch-1	2014-15	21.578	83.669
192	Hirakud WL	Lakhanpur	Jhagadabehera	Jhagadabehera	Meadow development patch-2	2014-15	21.579	83.669
193	Hirakud WL	Lakhanpur	Jhagadabehera	Jhagadabehera	Causeway	2012-13	21.568	83.658
194	Hirakud WL	Lakhanpur	Jhagadabehera	Jhagadabehera	Water Body	2012-13	21.575	83.668
195	Hirakud WL	Lakhanpur	Jhagadabehera	Jhagadabehera	Forest Guard Quarter	2015-16	21.563	83.644
196	Hirakud WL	Lakhanpur	Jhagadabehera	Patheidurga	Water Body - Kuldora	2013-14	21.538	83.633
197	Hirakud WL	Lakhanpur	Jhagadabehera	Patheidurga	Forest Guard Quarter	2011-12	21.549	83.618
198	Hirakud WL	Lakhanpur	Jhagadabehera	Patheidurga	Solar fencing	2016-17	21.549	83.618
199	Hirakud WL	Lakhanpur	Jhagadabehera	Patheidurga	Gully ploughing-1	2016-17	21.551	83.623
200	Hirakud WL	Lakhanpur	Jhagadabehera	Patheidurga	Gully ploughing-2	2015-16	21.564	83.628



## Photographs - Angul Circle



Block Plantation at Bamur Range of Athamallik Division (APO-2009-10)



ANR with GAP Plantation at Athagarh Range of Athagarh Division (APO-2011-12)



Block Plantation at Bamur Range of Athamallik Division (APO-2015-16)



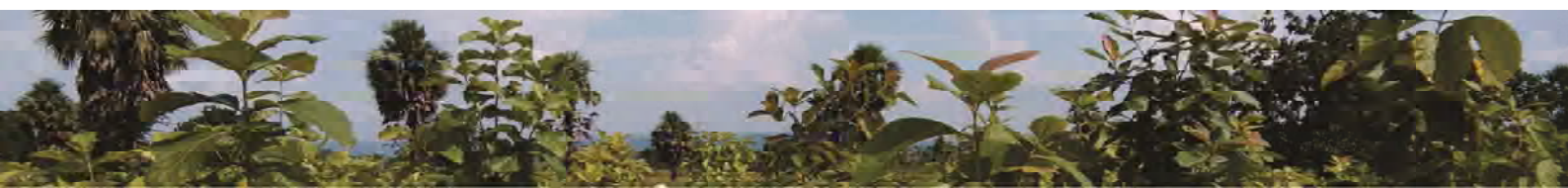
SSO Timber at Chendipada Range of Angul Division



AJY Activities – Kaniha Range of Angul Division



Bald Hill Plantation at Dalijoda Range of Cuttack Division (APO-2013-14)







Block Plantation at Bankgochha East Range of Mahanadi Wildlife Division (APO Year- 2009-10)



ANR with gap Plantation at Sadangi Range of Dhenkanal Division (APO Year- 2015-16)



Block Plantation at Chhamundia Range of Mahanadi Wildlife Division (APO Year- 2009-10)



Block Plantation at Hindol Range of Dhenkanal Division (APO Year- 2010-11)



Block Plantation at Tikarpada Range of Satakosia STR (APO Year- 2009-10)



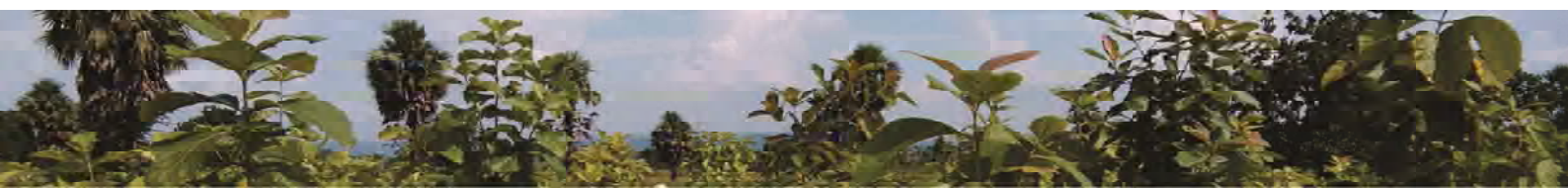
Sacred Groves (Plantation) at Madhapur Range of Athamallik Division (APO Year 2014-15)



ANR without Gap (A/Y) at Purunakote Range of Satakosia STR (APO Year – 2014-15)



Avenue Plantation at Handapa Range of Athamallik Division (APO Year – 2012-13)







SSO Bamboo at Narasinghapur Range of Athagarh Division  
(APO Year – 2013-14)



Forest Guard Quarter at Tamka Range of Cuttack Division  
(APO Year – 2015-16)



Causeway and Forest Road at Handapa Range of Athamallik Division  
(APO Year – 2009-10)



LBCD near SSO Timber at Chhendipada Range of Angul Division  
(APO Year – 2012-13)



Water Body at Bamur Range of Athamallik Division  
(APO Year – 2015-16)



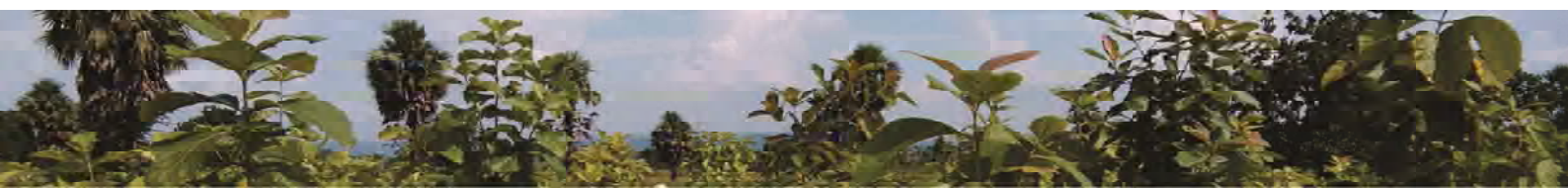
Deer Park at Banigochha Range of Mahanadi Wildlife Division  
(APO Year – 2012-13)



Range office at Athagarh Range of Athagarh Division  
(APO Year – 2011-12)



Surface Dyke at Kusanga Range of Mahanadi Wildlife Division  
(APO Year – 2016-17)







Earthen Graded Bond at Chhamundia Range of Mahanadi Wildlife Division (APO Year – 2012-13)



Antipoaching Shed at Pumpasara Range of Satakosia STR (APO Year – 2016-17)



Residence of Range Officer at Pumpasara Range of Satakosia STR (APO Year – 2013-14)



Sign Board for ANG with GAP Plantation at Kaniha Range of Angul Division (APO Year – 2015-16)



Staff Barrack at Purunakote Range of Satakosia STR (APO Year – 2016-17)



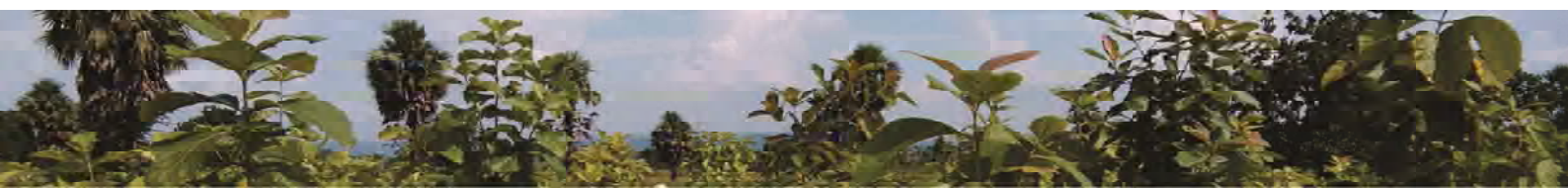
Staff Barrack at Badamba Range of Athagarh Division (APO Year – 2012-13)



Saltlick at Tikarpada Range of Satakosia STR (APO Year – 2011-12)



Check Gate at Purunakote Range of Satakosia STR (APO Year – 2013-14)







Forester's Office cum Residence and VHF Tower at Bamur Range of Athamallik Division (APO Year – 2013-14)



Watch Tower with VHF Tower at Hindol Range of Dhenkanal Division (APO Year – 2015-16)



Seizure Yard at Kusanga Range of Mahanadi Wildlife (APO Year – 2011-12)



Elephant Trench Proof at Chhamundia Range of Mahanadi Wildlife (APO Year – 2015-16)



Solar Fencing at Kusanga Range of Mahanadi Wildlife (APO Year – 2016-17)



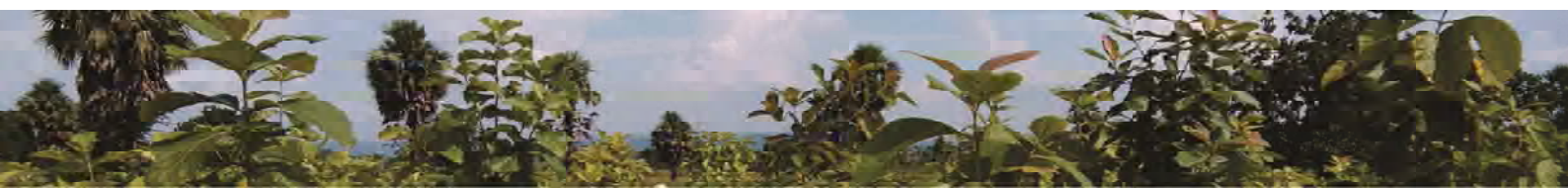
Seizure Yard at Tamka Range of Cuttack Division (APO Year – 2012-13)



Meadow Development at Kusanga Range of Mahanadi Wildlife (APO Year – 2016-17)



Common Toilet at Tamka Range of Cuttack Division (APO Year – 2011-12)







Culvert at Sukinda Range of Cuttack Division  
(APO Year – 2011-12)



Sacred Groves at Chhendipada Range of Angul Division  
(APO Year – 2016-17)



Central Nursery at Athagarh Range of Athagarh Division  
(APO Year – 2013-14)



LBCD under AJY Activities at Kaniha Range of Angul Division  
(APO Year – 2014-15)



Interpretation Center at Banigochha East Range of Mahanadi Wildlife  
(APO Year – 2009-10)



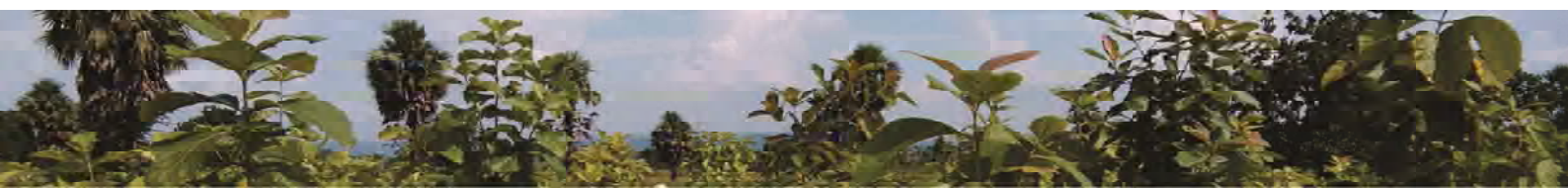
Cause ware at Narasinghpur Range of Athagarh Division



Tube Well at Kusanga Range of Mahanadi Wildlife  
(APO Year – 2011-12)



Salt lick at Tikarpada Range of Satakosia STR





## Photographs - Bhubaneswar Circle



Block Plantation of Khurdha Range of Khurdha Division  
(APO Year – 2011-12)



Mangrove Plantation, Mahakalpada Range, Rajnagar Wild Life  
Division, APO Year - 2013-14



Mangrove Plantation, Satavaya Range, Rajnagar  
Wild Life Division, (APO Year - 2010-11)



Bald Hill Plantation at Khandapada Range of Nayagarh Division  
(APO Year – 2015-16)



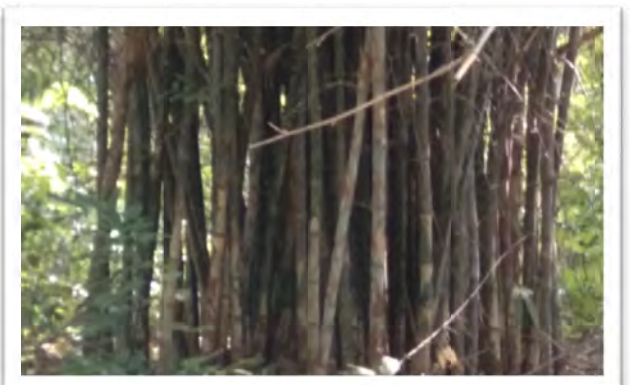
ANR with Gap Plantation, Rambha Range, Chilika  
Wild Life Division, APO 2016-17



1 Avenue plantation of Gop Range of Puri Division,  
Bhubaneswar Circle



Maintaince of Avenue Plantation, Chandwali Range,  
Bhadrak Wild Life Division



SSO Bamboo at Khandapada Range of Nayagarh Division  
(APO Year – 2014-15)







ANR with Gap Plantation at Mahipur Range of Nayagarh Division (APO Year – 2014-15)



Malkhana at Mahipur Range of Nayagarh Division (APO Year – 2010-11)



Block Plantation at Khandapada Range of Nayagarh Division (APO Year – 2009-10)



Central Nursery at Khandapada Range of Nayagarh Division (APO Year – 2015-16)



Block Plantation at Odagaon Range of Nayagarh Division (APO Year – 2009-10)



Saltlick at Dampada Range of Bhubaneswar Division



Mega Nursery at Mahipur Range of Nayagarh Division (APO Year – 2013-14)



Seizer Yard at Tangi (Territorial) Range of Khurdha Division

