

**Report on
Evaluation of Forestry Works
for the period 2009-2013**

CAMPA: UNIT - I & III



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CAMPA

I. EXECUTIVE SUMMARY

1. Introduction

The Compensatory Afforestation (CAMPA) program is formulated with an objective of raising alternative plantation to compensate the loss of forest area diverted for the purpose of developmental programs under the Forest Conservation Act-1980. The program and activities is completely funded from the fees collected from the project proponents as NPV and plantation cost. The main objective of CAMPA is to create additional plantations on the non-forest land acquired from the project proponents or on the degraded forest lands identified for the compensatory plantations. The guidelines for utilizing the CAMPA funds are issued by the Ministry of Environment and Forests from time to time. The Governing council created in the state headed by The Chief Secretary is responsible for proper utilization of funds according to the guidelines.

2. Aims and Objectives of State CAMPA

- Conservation, protection, regeneration and management of existing natural forests.
- Conservation, protection and management of wildlife and its habitat within and outside protected areas including the consolidation of the protected areas.
- Compensatory Afforestation.
- Environmental services, which include:
 - (i) Provision of goods such as wood, non-timber forest products, fuel, fodder and water, and provision of services such as grazing, tourism, wildlife protection and life support;
 - (ii) Regulating services such as climate regulation, disease control, flood moderation, detoxification, carbon sequestration and health of soils, air and water regimes;

(iii) Non-material benefits obtained from ecosystems, spiritual, recreational, aesthetic, inspirational, educational and symbolic; and supporting such other services necessary for the production of ecosystem services, biodiversity, nutrient cycling and primary production.

- Research, training and capacity building.

3. **Funding sources**

The scheme is provided by the CAMPA funds consolidated by Government of India from the NPV and charges collected from the project proponents for diversion of forests lands for the non-forestry purpose.

4. **Evaluation Objectives of CAMPA**

The CAMPA work has been awarded for evaluation work in two units of the State. Each unit is composed of group of circles comprising of 11 divisions in each Unit. The following objectives have been listed as the Terms of Reference of the evaluation:

A. Physical verification

- To measure the extent to which the works were carried out for each of the schemes.

B. Impact assessment

- To measure the efficiency and effectiveness of the schemes.

C. Gaps in implementations

- To identify the key issues and gaps in implementation and offer recommendations that could improve the quality of the implementation.

5. **Methodology adopted for evaluation**

5.1. **Plantations**

As per the terms of reference, 10 % of total number of plantations was randomly selected from each division and in each year. The selected samples were later evaluated with 2% intensity. For every 5 ha of plantation one sample plot of 0.1 ha was randomly selected using GPS to measure parameters like height, survival rate, collar diameter and vigour of the plantations. The general observations were also selected with respect to biodiversity, soil moisture conservation work etc.

5.1.1. Procedure to select plots in plantations

The plantations were divided in to 5 ha grid on the map. Depending on the size of the plantation the number of sample plots was selected as follows:

Selecting 0.1 ha in 5 ha grid: in a 5 ha grid the plots are divided into 7*7 rows and columns .as shown in fig below. Further the procedure to select plots for different size plantation is given well in advance as shown in below:

1	2	3	4	5	6	7	1) 5 ha	-4 th row	6 th Colum (1 sample plot)
2							2) 10 ha	-3 rd row	7 th Colum (1 and 2 sample plot)
3							3) 15ha	-2 nd row	2 nd Colum (1, 2 and 3 sample plot)
4							4) 20 ha	-5 th row	4 th Colum (1, 2, 3and 4 sample plot)
5							5) 25 ha	-1 st row	6 th Colum (1, 2, 3, 4 and 5 sample plot)
6							6) 30 ha	- 6 th row	3 rd Colum (1, 2, 3, 4, 5 and 6 sample p.
7									

Regarding virtual demarcation of sub plots of 0.1 Ha, One need not physically divide the subplots on the ground. For example 4th row 6th Colum means we take 31 × 4 meters (124 meters) from the corner main plot to the point on 4th row and then from the marked point, measure 6×31 meters to reach the 6th Colum (horizontally) . Followed same procedure for all other rows and columns.

5.2. Fire protection

Fire line formations were physically checked and as fire protection work is difficult to verify, proxy methods like alter fire protections were effective or not, were used.

5.3. Boundary consolidation

The GPS was used to record the perimeter. Randomly the measurements were recorded. The quality of the work regarding the effectiveness was recorded as Good, Satisfactory, Poor with any other field observations.

5.4. Vehicles and Equipment

Vehicles and equipment verified through frequency of use, checking the stock book, brand/company, checking log book etc.

5.5. Wildlife works

The quality of the work for its effective use or abandoned and its impact on the objective was recorded. Verification of the wildlife crimes caught by the camp personnel in the corresponding year, increase or decrease in the crimes in the corresponding year was recorded. Salt licks are difficult to verify but proxy indicators like pits or animal sighting records, if available, were used as they are maintained in the parks.

5.6. Building works and maintenance

The quality and usefulness was the criteria to judge the work of building maintenance and for the roads physical quantity like length, width and depth at random places was measured.

6. Over view of Evaluation Results

The field data collected through questionnaires were tabulated and analyzed to arrive at the success of the plantations on parameters like survival rate, height and collar diameter. The age of the plantation being very small (1-3 years), therefore the productivity estimation was not attempted.

6.1. CAMPA plantation evaluation

6.1.1. Physical verification of the plantations

The plantations selected randomly with 10% sample size were physically verified and checked for their following parameters:

- Location (by measuring the latitude and longitude)
- Extent (area)
- Species planted.
- Protection works

➤ **Circle wise Grading of plantations:**

The plantations were assessed for the survival rate at 2% sampling intensity. The grading of the plantations circle wise is presented to illustrate the success rates.

The plantations selected on the randomized basis were assessed by measuring the growth parameters along with the survival counts. The results are tabulated to estimate the survival percentage for each division. Further the weighted average for the circle was estimated. The plantations were ranked as very good (80% and above); good (60-80%) and average (40-60%). The plantation with 20-40% survival rate was graded as poor and the plantations having survival rate less than 20% was grouped as failed. This categorisation is based on the method used by KFD for its internal evaluation. The following results were obtained for different category of the plantations:

In all the circles 25% of the plantations were rated as very good and 61% of the plantations as good followed by 11.9 % of the plantations as average plantations where the survival rate is between 20-40%.

The tables representing the grading of the plantations indicate the successes rates in each circle

CIRCLES	Number of plantations evaluated	RANKING OF PLANTATIONS				
		VERY GOOD (>80 %)	GOOD (60 – 80%)	AVERAGE (40 – 60 %)	POOR (20 – 40 %)	FAILURE (< 20 %)
Belgaum	13	30.76	61.53	7.69	0	0
Bellary	33	15.00	75.00	10.00	0	0
Chikmagaluru	3	25.00	75.00	0.00	0	0
Dharwar	9	16.66	50.00	33.33	0	0
Gulbarga	7	15.38	53.86	30.76	0	0
Hassan	6	0.00	84	0.00	16	0
Shimoga	8	100.00	0.00	0.00	0	0
Weighted average		25.5	61.12	11.9	1.21	0

Belgaum: In Belgaum circle, 13 plantations were assessed and found that 30.76% of the plantations were graded as very good with survival rate of 80% and above. Similarly 60% of the plantations were recorded as good. However 7.69% of the plantations were falling in the poor grading category.

Bellary: In Bellary circle, 33 plantations were assessed and found that 15 % of the plantations were graded as very good with survival rate of 80% and above. Similarly 75% of the plantations were recorded as good with the survival rate of 60-80%. However 10% of the plantations have shown very average growth performance.

Chikmagaluru: In Chikmagaluru circle, 3 plantations were assessed and found that 25 % of the plantations were graded as very good with survival rate of 80% and above. Similarly 75 % of the plantations were recorded as good.

Dharwar: In Dharwar circle, 9 plantations were assessed and found that 16% of the plantations were graded as very good with survival rate of 80% and above. Similarly 50% as good with the survival rate of 60-80%. However 33 % of the plantations have shown very average growth performance which is significantly high.

Gulbarga: In Gulbarga circle, 7 plantations were assessed and found that 15.38 % of the plantations were graded as very good with survival rate of 80% and above. Similarly 53.86% as good with the survival rate of 60-80%. However 30.76% of the plantations have shown very average growth performance which is significantly high.

Hassan: In Hassan circle, 6 plantations were assessed and found that 84% of the plantations were graded as good with the survival rate is ranging between 60-80%.

Shimoga: In Shimoga circle, 8 plantations were assessed and found that all of the plantations were graded as very good with the survival rate above 80%.

The overall survival rate was around 78% for all the plantations under CAMPA in Belgaum, Dharwar and Gulbarga circles. As the plantations were very young the success rate was good. However the success rate was relatively low in the third year plantations as compared to first year plantations. The performance of the plantations has been graded according to the success rate.

6.1.2. Species suitability analysis

Dry zone species: In general in the dry zones the most common species planted are *Pongamia pinnata*, *Cassia siamea*, *Hardwickia binata*, *Glyricidia* and *Azadirachta indica*

Dharwar circle: *Pongamia pinnata* was the planted with 81% intensity followed by *Melia dubia*.

Gulbarga: The most common species planted was *Pongamia pinnata* with 82% followed by *Glyricidia* and *Cassia siamea*.

Bellary: The most common species planted is *Pongamia pinnata*, *Hardwickia binata* and *Embelica officinalis*.

Transitional Zone: In the Transitional zone of mainland the most common species planted are *Acacia auriculiformis* followed by hardwood species like *Terminalia*, Teak, *Syzygium* and Bamboo.

Belgaum: In Belgaum *Acacia auriculiformis* was the highest planted species followed by *Holoptelic integrifolia*.

Shimoga: In Shimoga circle, the most commonly planted species were *Cassia siamea*, *Acacia auriculiformis*.

Chikmagaluru: The most common species planted is *Acacia* followed by bamboo and *Syzygium*.

6.1.3. Height growth

The height was measured and tabulated to estimate the growth potential and to project the productivity. The mean height though varied from species to species the mean annual increment was around 0.8 meter for all the species in the high rainfall areas like Belgaum and Shimoga. Similarly in the low rainfall areas like Gulbarga, Bagalkot it was slightly lower than 80 cm per year. The slow growing species in the high rainfall areas were comparable with the fast growing species in the low rainfall areas with regard to the height increment.

6.1.4. Collar diameter

The mean collar diameter is 3.3 cm per annum in the high rainfall areas and 2 cm in the low rainfall areas. The increments were varying from species to species and from site to site due to many locality factors.

6.2. Fire protection and fire line formations

The works were assessed through verification of records and other proxy evidences. The works were found executed as per the Range records. However their quality and the site specific needs were not assessed which may be necessary as there are sudden increases in the investment on the fire protection from CAMPA.

6.2.1. Key Findings

- Investment in the fire protection has increased considerably over the years which are good sign of protection measures being initiated.
- In seven circles the total length covered under fire protection is around 6645 km in two years. In 2009-10 the fire protection is done in 3095 km. In 2010-11, the work is executed in 3300 km.
- The works could not be checked as they were done two years before the field inspections.
- In Dharwar and Bidar two fireworks could not be located.(details are in the main report)

6.3. Wildlife works

Wildlife works including salt licks, de-silting of water holes, anti-poaching and Elephant depredation camps were assessed and the results are discussed in the main report.

6.3.1 Key findings

- All the works checked were executed two to three years back (like camps, salt licks, fire protections) and they are difficult to verify through physical evidences
- Water hole locations should be based on the site specific needs.
- The idea behind the protection camps is to cover the core and interior areas which are not having access by the roads.

6.4. Survey and Demarcation

The Boundary consolidation and D line formation works have been executed as per the specifications and the works are effective as they go a long way in consolidating the encroachment prone areas protection very effective.

The boundary consolidation works are taken as piece works of 2-4 km length depending upon the availability of funds. It is advisable to take and complete the work at one goes so as to ensure complete protection. Instead of thinly spreading the resources on vast areas it is advisable to take-up the works for complete consolidation.

6.5. Building Construction and Maintenance

The Building maintenance involving white washing and small repairs have been found very useful. The construction of permanent APC sheds and other similar works were observed to be according to the approved estimate. There should be a regular maintenance of the works once in two or three years so that building durability may be enhanced. The special maintenance works may be avoided.

6.6. Vehicles and equipment

The equipment and vehicles were evaluated for the physical verification and specifications. It was found in accordance with the specifications mentioned in the database. The vehicles allotted were also assessed against the specifications and verified the usage and the stock registers.

6.7. Nursery Works

The infrastructure works undertaken as part of the nursery improvement works were evaluated and assessed for the physical execution and for the quality. The roads, permanent beds and fencing were the items of activities under this scheme. It is observed that all the sampled works were in accordance with the specifications and were useful.

6.8. Soil Moisture Conservation Works

The SMC works sampled and evaluated have been found verified in their respective locations. The quality of the work is in accordance with the specifications. Water was not found during the month of March, at the time of inspection, raising doubts about the usefulness.

6.9. Findings

All the plantations randomly selected were found to have correct location and extent under CAMPA except three plantations. Out of 79 plantations 3 were not found despite the best efforts of the forest department officials. Then total missing plantations works out to 5% of the total plantations. The plantations (missing) were in Haveri, Dharwar and Bhadravathi divisions.

V. CAMPA- Suggestions / Recommendations

1. The activities under CAMPA are too many resulting in very thin spread of investment for each activity which may not give desirable results. It should focus much on the compensatory plantations by spending 70% investment and rest on the natural forests management.
2. The investment on the research and wildlife needs to be augmented.
3. The natural forests, bio-diversity conservation, enrichment planting and research programs may also be given importance.
4. **Plantation size:** Many compensatory plantations raised are very small in size (less than 5 ha). To make the plantation more viable smaller units may be aggregate into a bigger unit. It is better to aggregate the smaller units into a viable size of at least 10 ha to raise plantations.
5. The plantation on degraded sites may be carried out with due care to avoid taking up plantation in well stocked areas.
6. The site clearance for raising plantation was noticed in some areas which needs a relook.
7. **Choice of species:** It is suggested to match the species and site selected for raising plantations.
8. Native species mix may be planted as core species in compensatory plantation in high rain fall areas for getting better results.
9. The SMC works are to be carried out more scientifically by using contour maps.
10. **Plantation care:** The plantation care and maintenance may be carried out for a reasonable period of five years for better success of the plantation.