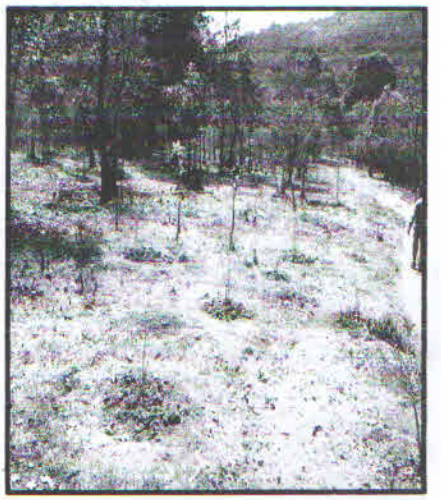
Report on

Evaluation of Forestry Works

for the period 2009-2013

NBM: UNIT – I & III



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NABCONS

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National Bamboo Mission

Executive summary

1. Introduction

The National Bamboo Mission (NBM), a Government of India scheme being implemented in the State of Karnataka with an objective of improving the growing stock of Bamboo resources in the country and to ensure sustainable access to the traditionally dependent communities to take up value addition activities.

2. Objectives of the scheme

a) Improve the productivity of Natural Bamboo resources through adoption of good management practices.

b) Increase the Bamboo resources through creation of new bamboo plantation.

c) Improve the access of stakeholders to bamboo resources.

d) Training and capacity building in value addition and skill development and market linkage.

3. Funding

The funding to the program is made by the bamboo mission agency of government of India on annual basis.

4. Evaluation objectives

The Evaluation of various activities implemented during the year 2009-10, 2010-11, and 2010-12 were undertaken in 7 circles of the Karnataka Forest department with the following objectives:

(a) Physical verification of the assets/activities implemented with 10% sampling intensity.

(b) Assessing the success of the plantations/growth performance/durability of assets.

(c) The impacts of the activities on the achievements of the objectives/goals.

(d) To analyze the causes and impediments in achieving the objectives.

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 vigor of the plantations. The general observations were also made with respect to biodiversity, soil moister conservation work etc.

5.1.2. Procedure to select plots in plantations

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

(1) <5 Ha - one sample plot

(2) <10 Ha - two sample plot

(3) <15 Ha - three sample plot

(4) < 20 Ha - four sample plot

(5) >20 Ha – one sample plot for every 5 Ha

(6) Sample plot size – 1000 m^2 (31.62 m × 31.62 m)

(7) GPS point: please record the GPS point.

Selecting 0.1 ha in 5 ha gird: 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
2						
3						
4						
5						
6						
7						

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

Regarding virtual demarcation of sub plots of 0.1 Ha, one need not physically divide the subplots on the ground. For example 4throw 6th Column 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) . The same procedure is followed for all other rows and columns.

6. Over view of Evaluation Results

6.1. Plantation Evaluation

The main activity of the Bamboo mission scheme is raising the Bamboo plantations in the degraded forests or any other suitable land. During the period of evaluation for the three years (2009-13) in five circles 1417 ha of plantations has been raised in various divisions.

6.2. Package and practices adopted

The Bamboo forest sites which are degraded have been selected to take up planting and pitting method has been followed as a general practice with spacing varying from 5mx5m to 10mx10 m depending upon the degree of degradation in different sites. The pits size varies from 50cmx50cmx50cm to 75cmx75cmx75cm. In high rainfall areas *Bambusa arundanacea* has been planted as it is naturally found in these areas, whereas in the moderate and low rainfall areas *Dendrocalamus strictus* has been planted which is a natural species in the drier climatic zone. However, in the natural bamboo flowered but degraded sites, site improvement work like tending and hoeing has been done to the regenerating seedlings with good protection measures from fire and grazing.

6.3. 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 categorization is based on the internal evaluation guidelines followed by KFD. The following results were obtained for different category of the plantations:

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 %)
Belgum	5	40	40	20	0	0
Bellary	4	50	25	0	25	0
Chickamagalore	3	33.3	33.3	33.3	0	0
Hassan	3	0	75	0	25	0
Shimoga	4	75	25	0	0	0
Weighted average		**42.1**	**38.1**	**7.8**	**9.21**	**0**

Belgaum: In Belgaum circle 5 plantations were assessed and found that 40% of the plantations were graded as very good with survival rate of 80% and above. Similarly 40% of the plantations were recorded as good. However 30% of the plantations were falling in the average grading category.

Bellary: In Bellary circle 4 plantations were assessed and found that 50% of the plantations were graded as very good with survival rate of 80% and above. Similarly 25% of the plantations were recorded as good with the survival rate of 60-80%. However 35% of the plantations have shown very poor growth performance.

Chikmagaluru: In Chikmagaluru circle, 3 plantations were assessed and found that 33 % of the plantations were graded as very good with survival rate of 80% and above. Similarly 33 % of the plantations were recorded as good.

Hassan: *In Hassan circle 3 plantations were assessed and found that 75 % of the plantations were graded as good with survival rate of 60-80%. Similarly 25 % of the plantations were recorded as* poor.

Shimoga: In Shimoga circle 4 plantations were assessed and found that 75% of the plantations were graded as very good with the survival rate is ranging between 80% and above. However 25% of the plantations have shown good growth performance.

6.4. Findings

6.4.1 Success Rate: The survey has shown that 42 % of the plantations raised under the scheme has shown very good success rate under the NBM scheme. Further nearly 38 % of the bamboo plantations have shown good success rate indicating high success rate of the plantations. The average success rate was about 7 % which is attributable to poor site quality. However, the poor plantations were in two sites out of 19 sites surveyed and these sites fall in the very low rainfall areas.

6.4.2. Growth performance: The growth performance of *Bambusa arundanacea* was found very well in high rainfall areas like Shimoga and Hassan with an average height growth rate of 5.7 meter in three years is very impressive followed by many plantations with an average growth of 1.1 meter per year.

- The collar diameter of the best plantation was ranging between 0.7 to 1.3 cm diameters indicating the good growth performance as compared to natural forests performance.
- The number of culms per clump was found to be varying between 2 to 8 with an average of 5 culms per clump in three year growth indicating a promising growth potential.
- Nearly 10 % of the plantations, which is rated poor,are a cause of concern as it would reflect the inherent problems in the site selection and species choice which has been a major problem in the plantation success.

6.4.3. Improvement of the existing stock: The evaluation of the works of improvement of stock has shown the culms productions vary from 3 to 4.5 clump. Similarly the collar diameter has mean of 0.65 cm/Culm.

IV. NBM- Suggestions / Recommendations

1. The investment on raising the Bamboo plantations in drier district may be avoided as the results are not encouraging.
2. The site clearance for raising plantation was noticed in some areas which need to be restricted.
3. During the field studies, it was observed that the plantation protection measures were not effective in many places. Therefore it is suggested that maintenance provisions may be provided for a reasonable period of 5 years.
4. NBM may explore involving the local community in raising and maintaining the plantations, preferably in the form of VFCs.