



REPORT OF THE COMMITTEE TO  
STRENGTHEN BAMBOO SECTOR  
IN MAHARASHTRA

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FOREST DEPARTMENT  
GOVERNMENT OF MAHARASHTRA

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JANUARY 2017

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## MESSAGE

Bamboo is the “The Green Gold” of the 21<sup>st</sup> century. It has multiple uses and is a gift of mother nature.

In the last few decades bamboo lost its importance as a daily life use article to modernisation and new age materials, but now with a renewed vigour bamboo is set to bounce back on centre stage to bolster the rural economy owing to the multiple uses in products such as engineered bamboo wood, bamboo ply boards, flooring, wall cladding, furniture, ethanol, charcoal and many other uses.

The forest department has set up a centre of excellence for bamboo at Chichpalli, Chandrapur and in a short span of time two hundred artisans have received skill enhancement training on bamboo. Realising its importance and its future value, Government has already set up a Maharashtra Bamboo Development Board in August 2016. In addition, the Government also constituted a Committee to look into all aspects of this resource and give a road map for strengthening the sector.

The committee had Shri V. Giriraj, Principal Secretary, Finance, who is well familiar with the sector, as its Chairman and Shri Vikas Kharge, Secretary, Forests as its Vice Chairman, Senior Forest Officials and knowledgeable non-officials as its members. The committee also received valuable suggestions from experts in the field.

I am happy to receive the report of the committee. I am confident that its recommendations will be greatly useful to the Government, corporate sector, NGO's, cooperatives and others in using bamboo resource for Maharashtra's development.

10 Dec 2016

(SUDHIR MUNGANTIWAR)  
MINISTER FOR FINANCE, PLANNING & FORESTS.  
GOVERNMENT OF MAHARASHTRA.

## **INTRODUCTION:**

### **The search for eco-friendly materials:**

Across the world there is a search for eco-friendly materials, which can be harvested and used sustainably. The climate change threat has only intensified the search for alternatives.

Individuals, institutions and governments are not only searching for new materials but also for new processes, and new uses for age old materials. Traditional items are getting 'revived' in today's context.

Just to cite an example, we can see the recent spurt of interest in 'quinoa', a traditional diet item of the countries adjacent to Andes Mountains – like Peru, in South America. This renewed interest, incidentally, also coincides with increasing gluten related problems due to consumption of wheat in USA and elsewhere. Likewise, in India there is a revival of interest on the traditional millet varieties (jowar, bajra, ragi and many other local variants like nachni ) which were, until a few decades back, the staple food of much of the population , particularly in the less rainfall area. This is coinciding with climate change challenges and erratic monsoons.

Bamboo is another such species which has drawn attention of many, because of its remarkable properties, variety of uses and fast growth. It is closely linked with livelihoods and culture of Asian countries including India for thousands of years. Till 1970s, its use was very widespread in the rural areas of India, but its position declined because of plastics and usage of other materials like concrete in construction.

### **The International Scene:**

Since 1980's there has been many International Congresses and conventions to exchange notes and strengthen scientific and technical knowledge and skills in bamboo. The International Bamboo and Rattan Network(INBAR) , in an international organization with forty one member countries. It is headquartered in China. Many of the Asian, African and South American Governments are members of INBAR. The Indian Government is a member of INBAR.

## **Bamboo in Chinese economy:**

This same period (that is post 1980s) also saw the rise of China in the world economy. Bamboo has, of course, been used for thousands of years in all countries of Asia but China gave a new impetus to its growth and modernization, through its Town and Village Enterprises (TVE) . Within a short time of thirty years (1980-2010) thousands of elegantly designed bamboo products like bamboo baskets, trays, hangers and such day to day items flooded US and other Western departmental stores. The Chinese and East Asian and South East Asian countries (like Taiwan, Vietnam) converted the traditional craft bamboo into an industrial process and product.

Also, China and other East Asian countries started producing 'engineered bamboo' materials in a big way. It is reported that there are about twenty types of bamboo panels in the market, and China's production of bamboo flooring material is about 28 million square metres, per annum. The Chinese even use the engineered bamboo for small truck bodies and in other unusual ways.

The size of the Chinese bamboo economy was estimated at 20 billion dollars in 2011 (that is more than Rs. one lakh crore), and most of its products were exported. This success of bamboo industry in China has demonstrated the potential of bamboo.

## **Bamboo in India**

The interest in bamboo as a 'resource' started in the late 1990's, when India became a member of INBAR. Government of India (Ministry of Environment and Forests) prepared an action plan for bamboo and cane sector and held a big seminar in August 1999. There was good participation by policy planners, designers and architects in this national seminar. This was an opportunity for designers, architects, botanists, NGOs, Government departments working individually for bamboo to come together. The UNDP started injecting substantial funds during the 1998-2004 period for development of bamboo sector and supported many Government organizations like National Institute of Design , Ahmedabad, Khadi and Village Industries Commission ,Development Commissioner ( Handicrafts), NEDFI- a Government sponsored financial institution for North East and a number of other agencies in North

East and elsewhere. Slowly an informal network of bamboo designers, entrepreneurs and other well wishers emerged in India.

Triggered by the interest shown by Government of India since 1998, the Governments in North East started taking interest in bamboo. Tripura Government organized a big workshop in Year 2000 and started developing a systemic approach to strengthening the bamboo sector in the State. They later set up the Tripura Bamboo Mission.

### **The Central and State Missions:**

Government of India set up two bamboo related missions in the last decade. The first was the National Mission for Bamboo Applications, set up under Ministry of Science and Technology. The next mission was National Bamboo Mission under Ministry of Agriculture- Horticulture Division. Interestingly, though bamboo has been traditionally looked after by the Ministry of Environment and Forests the above two missions have been set up under the umbrella of other Ministries. This shows the widening interest in bamboo.

At the State level a number of State Governments like Tripura, Nagaland, Uttaranchal, Kerala have set up their State Bamboo Missions. Recently, Madhya Pradesh Government has tried to reactive and strengthen the bamboo sector.

Further, in 2006 there was another significant development, namely the enactment of the Recognition of Forests Rights Act 2006.

### **Bamboo sector in Maharashtra:**

Maharashtra has about 21% area under forests and bamboo grows copiously in the forests along with teak and other species. It is reported that about 4800 kms are under good bamboo cover. Outside the forests, bamboo is also grown widely in farm bunds and it is always seen in bunches and clumps in rural Maharashtra. Specially, it grows profusely in much of the 600 km Konkan coast and also in Vidharbha and the tribal areas of Northern Maharashtra.

If one visits the rural areas and rural weekly markets, one still sees thousand of bamboo artisans sustaining themselves by making and selling many household

items and lakhs purchasing it. In addition bamboo is widely used as 'poles' in the fruit orchards and in vegetable cultivation. This is the traditional sector.

At the other end there is the 'modern' sector, that is application of bamboo for newer uses. There is no dearth of talent in this area in the State. A number of entrepreneurs have set up their bamboo units, and have sustained for over twenty years in spite of many difficulties and challenges.

But, overall, the problems faced by bamboo artisans and entrepreneurs in Maharashtra are same as in rest of India.

### **The challenges in bamboo sector in India:**

However, in spite of all their sincere efforts, it must be said that neither the Central and State missions have been able to meet the expectations. The bamboo sector is stagnating at some level. Yes, every year a few entrepreneurs- mostly designers and architects – enter this sector with fresh ideas, some bamboo panel unit start somewhere, but from total potential of this sector, the achievements have been very limited. These are indications that with right type of policy and financial support the sector will boom in future.

### **Careful study of the bamboo sector reveals that it is 'stuck up' all over India due to the following reasons:**

- a. Bamboo, at policy level is still treated as a 'forest' item, though it can be grown as much in farmlands. Unless bamboo is grown in a big way in the farmlands, there will be limitations on developing downstream activities. For growing bamboo in farmlands, various policy restrictions on its movement and transport need to be revised.
- b. Productivity of bamboo in forests is very low by international standards.
- c. Bamboo is still considered as a 'handicraft' item. So its development has been assigned to the Development Commissioner Handicrafts, in Government of India. This definition reduces its role, unintentionally, to mainly drawing room souvenir item. In practice, it is an utility item producing daily household needs and giving livelihood to lakhs of

people. Only if we change the way we look at bamboo will the sector develop.

- d. Bamboo houses and structures are treated as 'temporary' or *kuchcha*. It is not recognized by PWD in their schedule of rates. Actually bamboo structures can also last for a long time after some treatment. Further, there is nothing wrong even if there are some annual replacements or strengthening to the house. Rural people have traditionally repaired their houses pre monsoon for thousands of years. Banks do not acknowledge or recognize bamboo as a construction material and hence do not give 'loans' for so called *kuchcha* houses.
- e. Though it is said that India has high resources of bamboo, when one really goes to a specific area and start calculating the bamboo available to start some bamboo based unit, the entrepreneur finds there is no adequate or assured bamboo available as raw material for a business unit. This is so even in North East. So there is need to increase bamboo production and productivity in both forest and non forest areas first.
- f. There is great need for skilled artisans, supervisors, architects and designers- in short there is lack of skilled manpower required for this sector to expand in future.
- g. Earlier bamboo was put to use for thousand rural household items. Now there is competition from alternate materials, like plastics. So bamboo has yet to be precisely positioned for such locations and items where it is cost advantageous to use bamboo than any other competing item. Without this bamboo will be without a good 'market'. For example in tribal areas, bamboo is readily available at the backdoor. Why it cannot be used for good quality housing by using other materials selectively to enhance the value of bamboo material?
- h. Last but not least, the State initiatives and support have to be given in a different format than starting bamboo missions which works in typical Government method of distributing grants and has inherent limitations. This is detailed in the report.

The Government of Maharashtra appointed our Committee in July 2015 to look into the bamboo sector afresh and come out with practical suggestions and point out the way to strengthen the sector.



The Committee, as constituted, consisted of both officials as well as few successful bamboo entrepreneurs, architects, designers and social workers committed to tribal welfare and protection of forests. The Committee met about six times between August 2015 to October 2016. The Committee invited many experts including Prof Ramanuja Rao, who has spent twelve years in INBAR China, and knows the latest international trends and situations. As a part of its study the members visited Tripura State in November 2015. Some members also saw an interesting unit in Calcutta (AB Composites) which produces bamboo composites and uses it in railway coaches.

Great care has been taken to make the recommendations practical and doable . Further, the report visualizes growth of the bamboo sector through market interventions and community initiatives and not only by Government alone. These interventions involve minimal load on State funds.

**Bamboo sector is one which promotes all the four concerns (four 'E's) at same time:**

Economic Development

Environment Sustainability

Equity (that is, development of weaker communities, backward areas)

Employment

It is hoped that this report will help the Government, banks, corporates, NGOs, cooperatives, philanthropic trusts and all others who are interested in socio economic development of Maharashtra to frame suitable policies and strategies to strengthen the bamboo sector in a big way in Maharashtra.

## EXECUTIVE SUMMERY OF RECOMMENDATIONS:

Recommendation No.	Recommendation in brief	Who should implement/ operationalise	Whether Financial Implications?	If so, Indicative amount	Remarks
1.1.1	Declaring bamboo as a priority sector	Government	No	Nil	Policy decision
1.1.2	All departments to own bamboo sector	Government, departments	No	Nil	Forest department to ensure adequate representation for other departments
1.1.3	Sector to be developed in all parts of the State	Government	No		
2.1	Create Bamboo Board	Government	Yes	Staff and project expenditures	Already created by re organisation of staff –but Board needs to be made more representative
2.2 .1	Introduction of a multi disciplined team in Board	Forest Department	Minimal, as it will be by staff reorganization without new posts	Minimum	Funds can also be sourced from SC/ST for artisan cell for 3 years
2.2.2	Introduction of new reporting formats	Bamboo Board	Nil	Nil	Only if correct formats are there will correct information come out
2.2.3	Redefine role of Bamboo	Forest Department	Nil	Nil	

	Board and other Forest agencies				
2.3	Create bamboo cells within SFD and FDCM	Forest Department	Nil	Nil	
2.4	Improved communication for bamboo sector	Bamboo Board	Yes. Cost of website video films literature	Minimal	Should be professionally done, and some support can be obtained from TSP funds
2.5	Multi stake holder agency for bamboo sector	Government	One time expenditure	Rs.20-30 crores One time grant by government	Government has to proactively contact other potential participants to kick start this organization
3	Bamboo for Artisans – revisiting the guidelines	Government /Bamboo Board	Almost Nil		
4.1	Increase in specie biodiversity in Maharashtra forests	Forest department	Nominal, for nursery development etc	Minimal	
4.2	Developing a number of w Wadali type of nurseries in Maharashtra	Forest Department, Bamboo Board	Nominal		

4.3	Proper segregation and treatment of bamboo in bamboo depots	Bamboo Board	Nominal	Nominal additional expenditure will be offset by increased revenue from sales	Great benefits by increase in departmental income
4.4	Installation and treatment plants near big bamboo depots	Bamboo Board, Bamboo Promotion Company (BPC)	Initial costs	Nominal expenditure will lead to increased income	Great benefits by increase in income. Can be outsourced to a contractor etc
4.5	Developing bamboo resources within forests	Forest departments	Increase budgetary allocations for this aspect	Yes	Major policy decision – will lead to disproportionate increase in departmental income after few years
4.6	Commitments regarding availability of bamboo	Forest department, bamboo board	Almost Nil	Minimal	Proper planning required. Need to engage a professional agency if required
4.7	Role of FDCM	Forest Department, FDCM	Nominal	-	Any initial expenditure will be offset by fresh income after a while
4.8	Revisiting the 21.2.2014 GR	Forest Dept	Nil		
5	Bamboo – impact of FRA and PESA	Forest Department, Bamboo	Marginal-mainly for capacity	Minimal	Funds can be tapped from TSP and other

		Board, RDD, Tribal	building and specific activities		sources
6, 6.1, 6.2	Farm Bamboo	Government, Bamboo Board, BPC, SFD		can be shared by Government, BPA etc.	Many agencies will promote clusters.
7	Removing transit pass	Government	Nil	-	Major policy decision
8.1	Promoting integrated bamboo clusters	Government, Bamboo Board, BPC	Initial investment for the agency which promotes clusters	The expenditure can be under various projects by various agencies	DPR will have to be prepared for there clusters which will detail the plan
8.2	Promoting organizing bamboo bazaars	Bamboo Board, BPC	Limited expenditure	The initial expenditure will lead to increased income eventually	To be done professionally; user fees can be levied
8.3	Use of bamboo in selected settlements	Bamboo Board, BPC	Yes	Expenditure can be met from PMAY and other existing grant funds	Funds can be sourced from TSP, special projects etc
8.4	Separate DSR for bamboo	Forests, PWD	Nil	--	A consultant needs to be engaged
8.5	Use of bamboo in tree guards	Government - Forests, UDD	--	--	Bamboo Board must give technical specifications

8.6	Usage of bamboo in furniture, in rest houses etc	Government	---	---	
8.7	Legal status for Gadchiroli Agarbathi Project	Government	Nil	--	
8.8	Empanelling architects and partner organisations	Bamboo Board, BPC	Yes	--	Is expected to be implemented by BPC, not Government
8.9	Proper inventory of bamboo craftsmen, entrepreneur in State	BPC	Nominal	--	-do-
8.10	Promoting bamboo among architects and design students	BPC	Nominal	--	-do--
8.11	Partnership with skills studios etc	BPC	Yes	--	--do--

9	Human resources for the bamboo sector	Government, Bamboo Board	Yes. More amount should be spent on travel and TA/DA rather than hardcore faculty (unconventional approach)		To decide what is institutional mechanism for the centre To decide role of Tata Trusts
9.1	Bamboo structures at Chinchpalli training centre	Government	Yes	Minimal	Tata Trust support expected

## **RECOMMENDATIONS:**

### **1. The Overall Approach:**

In this report, we have prepared an action plan for developing the bamboo sector in Maharashtra. Developing any economic sector is bound to take time. It is said that the seed for the silk industry in Mysore today was sown during Tipu Sultan days in Mysore, almost two hundred years back, when silk worm was introduced. If we study sectors or cities known for a particular sector in India, ( say Ichalakaranji in textiles or Pen for *Ganesh Murthis* in Maharashtra ) it will be seen that they have behind them decades of development. How a sector will evolve depends on many unknown factors.

However, if we have a proper planned strategy, then the results can be seen early. There are many demonstrated examples of strategic intervention which has paid off. We are therefore submitting concrete steps, for the development of bamboo sector. We are confident that with focused efforts backed by some minimum but quality expenditure, good results will come out.

#### **1.1 Strategic Steps:**

##### **1.1.1 Declaring bamboo sector as a priority sector for development:**

The first strategic step we recommend is that Government must declare, upfront and clearly that 'bamboo sector' will be a 'priority sector' for the State and it will develop it substantially in next ten years, considering its potential in employment and its eco friendliness, and also as it makes economic sense. This decision must be taken at the highest, that is at Cabinet level, followed by an operative GR.

##### **1.1.2 All departments of the Government must 'own' the bamboo sector, not just Forest department:**

Forest department will certainly be the nodal department for this effort. But all other agencies of the Government must proactively develop this 'priority sector'. It is to be reiterated that the entire sector is to be developed, not just bamboo resources in forests.

##### **1.1.3: The sector must be developed in all parts of the State:**



Somehow, the general impression is that bamboo is produced and consumed in tribal areas only. Further, 'bamboo' is often associated with Gadchiroli or Vidharbha. Conscious attempts must be made to dispel this idea, and bamboo clusters and other initiatives must be developed **in all parts of the State**, wherever there is potential. Each area of the State is unique and is bound to evolve in their own way. Development of bamboo sector in different geographies of the State will also help in getting political and policy support for bamboo sector from all parts of the State.

#### 1.1.4 : **The five pillars of strategy :**

A number of recommendations are given below. They are interconnected, and many of these recommendations reinforce each other. While suggestions are many, essentially we propose five strategic interventions :

- **Create** the Bamboo Board to promote the bamboo sector within Forest department and within Government. Simultaneously, **also promote** a multi stake holder Maharashtra State Bamboo Promotion Agency (MSBPA) outside Government, in partnership with others.
- **Increase** bamboo production and productivity in forest areas in a big way by allowing communities to manage bamboo , and move forward in working in partnership mode with communities (PESA, FRA)
- **Earmark** forest bamboo for various categories of downstream industries for at least ten years
- **Intensively promote** about 10-15 compact bamboo clusters in various parts of the State. In these clusters increase in farm bamboo production will go hand in hand with development of downstream units to absorb the bamboos that will become available.
- **Fully remove** Transit Pass restrictions, or if that is not possible, keep it to barest minimum in selected pockets of the State.

### **1. Institutional Reforms:**

#### **1.1 Creation of a Bamboo Board :**

In Governments, the general practice in case a new sector or sub sector is to be developed then a new scheme is announced and generous fund allocations made. However, the issue of appropriate organizational design to conceive and implement is generally not adequately addressed. The existing stock of available officers and staff are used for the new challenge and work assigned to them either as additional or as a new responsibility. This is because of the 'apprehension' relating to creation of new posts even in an existing cadre. In case, new types of post are to be created, it is a complicated and time consuming task. In private sector, particularly corporate sector, new, relevant positions are constantly created (and deleted) depending upon the requirements. In Government, it is not easy.

**However, in our view, it is precisely organizational reforms that are most required (sometime even more than funds) for better delivery in bamboo sector.**

At present, the subject of bamboo is being handled by the APCCF (Production), supported by an Additional PCCF in the office of HoFF-Nagpur.

Our Committee is happy to note that as a follow up action of the Hon Finance Minister's budget speech in 2015, the Government has already constituted the Maharashtra Bamboo Development Board vide GR dated 6<sup>th</sup> August 2016.

It is noted that the new Bamboo Board has representatives from various key departments like Agriculture, Industries and Tribal Departments in its Governing Council. It is also noted that there is a smaller Executive Committee solely with officers of the Forest Department.

After a careful perusal of the Government Resolution dated 6<sup>th</sup> August 2016 on the Bamboo Board **we recommend certain further improvements that will make the Bamboo Board more effective:**

- There should be proper and adequate representation to non officials- people working in the bamboo sector, so that the users view is adequately represented in the bamboo board, both in the Governing Council and in the Executive Committee. Otherwise, it will become one more extension of the existing arrangements. We recommend representation for the following categories:
  - Representative of the artisan community
  - Representative from banks/NABARD
  - Representative of entrepreneurs in bamboo sector
  - Representative of the new Company which is being proposed separately (see recommendation 2.5 )
- There should be role clarity as to whether the Bamboo Board will be only a coordination agency or be an implementing agency by itself. For instance, promotion of farm bamboo. Will it done by the Social Forestry Department or Bamboo Board? Care should be taken to avoid duplication and parallel work by Government agencies.
- Likewise, there must be clarity from the beginning that two separate institutions are needed, to perform two distinctive roles. One is the Bamboo Board, which will work within the Government system, and another is an autonomous non Government Maharashtra State Bamboo Promotion Agency, but with Government also as a substantial stake holder. The Bamboo Board should not attempt to do what only the State Bamboo Promotion Agency can do effectively, without constraint, like working on commercial and business principles. And by recruiting professionals from the market who have a stake in the survival and growth of the organization.
- The staffing structure of the Bamboo Board should reflect and decide the direction in which it will work. Re organizing the staffing is of utmost importance. We have elaborated this in para 2.2 of our recommendations.

## **2.2 : Revamping the bamboo section in PCCF office/ new Bamboo Board Nagpur:**

### **2.2.1: Introduction of a multi disciplinary team:**

The Secretariat of the newly conceived Bamboo Board will be effective only if it is well equipped with adequate staff, and who can look into all aspects of bamboo. Particularly, **it needs to be a multi disciplinary team**, with induction of officers from other departments who will give a multi sided view of bamboo and its stakeholders. Such perspective will be missing if there is 'one point of view' from the standard hierarchy of officers from same department.

We recommend that the available posts within the Forest Department/Bamboo Board be reorganized and following posts be created:

- two Statisticians (say Assistant Director and Research Assitant – Planning Department cadre) to properly monitor the data relating to bamboo sector.
- One Deputy CEO from Rural Development for PESA related initiatives.
- We also recommend the induction of a Social Worker (MSW) or procurement of this service from an outsourced institution like a reputed Social work college/institution for monitoring artisan related concerns (like supply of *nistar* bamboo) in the bamboo secretariat at Nagpur. Since most of the bamboo artisans are SC/ST, funds could also be sourced from SC/ST departments.

The above is indicative. In short, different skill sets needs to be inducted into the bamboo section in Forest department (read Bamboo Board) to meet changing needs. The UNDP has created a separate division to help Government initiatives of this kind, and it is recommended that we may solicit support (financial or otherwise) of UNDP for organizational revamping.

### **2.2.2: Introduction of new reporting formats:**

Field officials tune themselves to what is asked and expected of them. If we ask the right questions, the right reply comes.

We feel that the present format of data collection by the PCCF Nagpur relating to bamboo needs drastic change. New sets of information, as relevant to changing times need to be collected regularly. This could include plantation under various species, productivity analysis, income and outflows through PESA and FERA. Suitable MIS softwares need to be developed so that the aggregation and analysis of data when filled by field officers happens automatically. Present data collection system is quite outdated. Key Result Areas (KRA) and good reporting formats need to be developed for the bamboo board/bamboo division in PCCF, which should be very different from the work profile at present.

### **2.2.3 : Redefine the role and responsibilities of the Secretariat :**

The Bamboo Board /Bamboo Section in the PCCF office should totally reorganize and reinvent itself. At present it essentially collects data from the field, helps in State level auction and functions as field arm of the Government. It is working in the traditional Government mould. In the future it needs to work more on promotion, coordination efforts between various agencies, initiate new projects, source funds from other than routine budget of Forest department and address the concerns of all stakeholders. In short, its own annual 'performance indicators' needs to be reworked.

### **2.3 Creating bamboo cells within Social Forestry Directorate (SFD) and FDCM:**

We also recommend strengthening of the SFD and FDCM by creation of a proper dedicated cell for bamboo within these organizations. This will ensure that performance is monitored within these organizations. At present, there is no such arrangement.

### **2.4 : Improved communication for bamboo sector :**

We recommend that a separate user friendly website be developed for the bamboo users in Maharashtra, as a part of the Bamboo Board

initiative. In addition user friendly video films and literature needs to be made for various categories of stake holders. A good short film shown in all PESA areas will go a long way in improving things in the field.

All these initiatives should be outsourced and done through professional agencies.

## **2.5 : Multiple Stake Holder Agency for developing bamboo sector in Maharashtra :**

Since 1998 Governments at Centre and States have been trying to strengthen the bamboo sector through various institutional initiatives. Thus ,the Government of India created the National Mission for Bamboo Application (NMBA) and National Bamboo Mission. Many State Governments have created State Bamboo Missions. They have been staffed by available Government officers, with additional staff from market on contract.

The impact of these Missions has not been up to expectations. It is seen that these Missions (both at Centre and State) depend on annual budgets and fund releases have been highly fluctuating year to year. They are also manned by Government officers, who land up in these organizations not necessarily for their expertise or understanding of bamboo, but due to other personal, extraneous reasons. Also after the initial enthusiasm, as time passes, officers get posted in a routine way, just to fill up a 'vacancy' slot from whoever is available. Further, Government officials are subject to transfers these organization also lack institutional memory and continuity. More, so, for developing a totally new frontier sector, where outcomes are unknown, **there is need for taking risks , work proactively , and willing to see failures.** More so the core personnel **need to continue for a long time and have a stake in the existence of the organization.** This is not possible in a typical Government or semi Government institutional framework. That is why none of the National or State Missions have been make the impact needed. Thus a decade of work for developing the bamboo sector has been piecemeal and haphazard, like taking medicines for curing a serious illness, off and on.

**We are of the opinion that a different organizational set up is required to implement and effectively take forward much of our recommendations.**

After studying what has succeeded over years, **we are recommending starting of a ' Maharashtra State Bamboo Promotion Company Limited ' ( title tentative) with multiple ownership.** We recommend an initial corpus of at least Rs.50 crore to get started.

We suggest that Government of Maharashtra put in a one time contribution of say Rs.20 crores, and approach other organizations like NABARD, SIDBI and other corporates , banks and trusts to put in their contribution in such a way that the State Government ownership does not exceed 50% ( 40% would be ideal), so that it has the advantages of a Government organization (size and status) but does not have the usual limitations of Government organization, which automatically starts once the ownership exceeds 50%. The organization could be a not for profit Company ( Old Section 25 of Companies Act). Due to recent requirements of Companies Act that companies contribute to CSR, we are of the opinion that many corporates will come forward to chip in with their share. Growing environment concerns and concept of 'sustainability' is another reason for interest in bamboo. It is a good development that Tata Trust has given preliminary support to this concept and have offered their contribution.

The advantages of such a multiple stakeholder organization are as follows:

- The ownership will be spread, so that it will be market and sector driven, and not dependent on budget and annual releases.
- A percentage of the corpus fund can be kept in bank and interest income can be earmarked for core staff expenditure, leading to continuity of staff and long tenures, without depending on annual budget. Thus expertise will develop within the organization useful for the sector.

- The Chief Executive Officer and other staff can be chosen from market
- Since Government stake is visualized to be less than 50%, it will not be a typical Government organization, so not constricted by Government procedures and Government system of audit, etc.
- At same time, the Government can be the highest stake holder (broadly SICOM model) and have say in management. There could be integration of the Bamboo Board, with this new conceived organization. Both can supplement with one another.
- The organization will be able to borrow from banks and financial institutions.
- It can work on sound commercial principles, with focus on advocacy, research, and development.

This new organization is proposed to be the implementer and prime mover of number of initiatives suggested as part of the report.

The formation of Maharashtra State Bamboo Promotion Company is one of the major and critical recommendations of this Committee.

## 2. **Bamboo for Artisans:**

The bamboo craft has been practiced, preserved and continued in India by traditional communities both tribal and non tribal. In the non tribal areas bamboo artisan communities are known by different names like *Buruds* in Maharashtra and *Basods* in Northern India.

The State Government has been providing raw bamboo at subsidized rates to these artisan communities, known as ***nistar rates***. They are given cards for getting the bamboo at concessional rates. At present, as per information made available, there are 7985 registered *burud kaamgars*. They are entitled to get up to 1500 bamboo per annum at highly concessional rates.

Considering that the artisans do value addition, create local employment and promote use of an eco friendly material there is a need to encourage and help them in their endeavours. Compared to the cost of



support which is given to bigger industries (even if they have multiplier effect and promote much indirect employment) the proposed expenditure is minimal.

We recommend the following line of action:

- Create a special artisan welfare cell within the Bamboo Board/PCCF office. It should be manned by a Social Worker (MSW). Alternately, this work should be outsourced to a good social work college/NGO in the bamboo sector.
- With their assistance, the number of *active card holders* (who get nistar bamboo need to be increased to **at least 20,000** (from 7985) in two years and more up to 50,000 thereafter. This will mean supporting about 50,000 (skilled artisan) families (or a population of 2.5 lakhs, considering five people per household) belonging to the weaker sections in the state with minimum expenditure.
- Most artisans, during discussions, indicated that they do not require 1500 bamboos for their work. In fact, their off take is much less. From the data made available by the Forest department, it is seen that the per family release of nistar bamboo to burud families over the years is less than 100 poles per annum, that the 1500 bamboos are only in theory.
- What artisans require is good quality green bamboo, preferably at their doorsteps. Hence, we suggest to reduce the quota from 1500 to 500 per annum, but accommodate more number of artisan families as indicated above .
- The nistar rates can be at 20 to 33% of prevailing market rates for same type of bamboo, and its prices can be adjusted accordingly, instead of relying on rates given in old GRs in which have become out dated.
- Here again we suggest introduction of two slabs, Slab 1 – that is 250 bamboo per annum for identified artisan families and if they are able to consume it then they go to Slab 2 – 500 bamboos per annum if they can off take it for two successive years.
- Since the nistar bamboos are also given to farming families, the need to give them in PESA areas can be revisited , considering that

in PESA areas the community has been given management control of bamboo, that is in PESA areas only the genuine artisan families will be getting the bamboo

- Further, there is need to legally examine if the obligation to give to the identified artisans can be shifted to communities themselves in PESA areas as ownership of MFP like bamboo has shifted to the communities themselves.
- The nistar bamboos should be green, or at least freshly harvested. Guidelines on working this is given in later part of report.
- There is a need to update their identity cards, departmental pass books, and also help in opening the bank accounts, give them Aadhar cards etc so that there is proper record keeping in PCCF office and link them with Aadhar based monitoring system to prevent misuse of their quota.
- A software needs to be developed for this purpose
- A sensitization workshop needs to be organized for the cutting edge officials like RFOs regarding the needs of *buruds*. The system of unwanted waiting and visits by *the buruds* to forest depots needs to be revisited, and system of informing them through mobile apps etc needs to be started.
- We strongly recommend earmarking certain portions of forests where *burud* HH can manage /maintain the bamboo stocks to meet their needs, as a Joint Forest Management initiative. Details are given later in this report.
- We suggest that expenditure for strengthening the artisan cell can be tapped from the SC/ST department or similar funds.
- Wherever possible Common Facilities Centre (CFC) consisting of simple equipments must be promoted in *burud* and other artisan settlements. The Bamboo Board/MSBPA must standardize the CFC equipments to be installed.
- The entire set of GRs issued in relation to provision of bamboos for *buruds* needs revisit and consolidation. A single GR in supersession of all existing GRs need to be issued on this subject

for benefit of all. A small user friendly booklet for use by buruds is need of the day.

### **3. Bamboo in Forests:**

#### **4.1 Increase in bamboo specie biodiversity in Maharashtra forests:**

We find that *Dendrocalamus strictus* and bambusa bamboos are the main specie grown and nurtured in the forests. The National Mission for Bamboo Application, in collaboration with Indian Council for Forest Research and Extension (ICFRE) and Forest Institute , Peechi , Kerala has recommended sixteen popular species for use in various topographies with various end uses, across India.

Not much attention has been given to specie diversification in bamboo in Maharashtra. It has been left to convention. **We recommend that Forest department must proactively introduce new bamboo species across the State, after due diligence, keeping the ecological and other criteria in mind.** They may integrate this new approach in their working plan in a suitable way. For this purpose, they may nurture nurseries and related practices accordingly.

#### **4.2 Developing a number of Wadali type nurseries in State:**

We also find that the knowledge and skill base relating to species management is limited and need to be expanded. More nurseries like the one at Wadali, Amravati wherein a number of species are cultivated and propagated caringly by committed officers need to be developed for the State. We recommend at least one Wadali type nursery per forest circle in the first round. We recommend good training and capacity building in bamboo propagation and related techniques, among the IFS and State Forest Officers on a priority.

#### **4.3 Proper segregation and treatment of bamboo in bamboo depots:**

The value of bamboo poles increase if they are properly segregated and stacked accordingly. This helps the end users as well. At present it is a challenging task for small players who need high quality bamboo to take it out of the depot. The mixing of all types of bamboo at the bamboo depot does not encourage value addition in bamboo sector. Like bad money driving out good money (Gresham's Law) in monetary economy, the poor segregation of bamboo at depot stage only helps the contractors who use it for low end like pandals, scaffolding, whereas artisans, construction agencies are put to difficulties.

The case study of the village Panchgoan in Chandrapur district is very interesting. The villagers got access to bamboo as a Community Forest Right under FRA. They started selling this bamboo by inviting the contractors. Being new to the business, in the first year the villagers got less income when they sold the bamboo without segregation. Slowly, they understood their mistake, and starting stacking them size and quality wise in the subsequent years and then offered them for sale. Immediately the offer rates zoomed. This clearly demonstrates that the villagers could increase their income substantially by proper stacking and segregating their bamboo, that is, *a value addition at their village level itself*.

This step is bound to increase the income of the Forest department, and lead to value addition for all end users.

#### **4.4 Installing treatment plants within or near big bamboo depots:**

We suggest that appropriately sized bamboo treatment plants be installed within the campus of important depots selling bamboo, or if that does not work out, near the depot. This service may be assigned to private agencies through tendering method. After the bamboo is sold, the buyer can add value to his bamboo by treating it then and there ( by making additional payments) and then lift it. This will save transportation costs to the buyers and strengthen the bamboo economy in the State.

#### **4.5 Developing bamboo resources within forests :**

It is well known that productivity of bamboo in Indian forests is very low. It is reported that there are 8400 sq kms of bamboo within the forest area of about 61,000 sq kms in Maharashtra. This is 13% of forests and a huge area. However, even if bamboo is treated as a specie for preserving bio diversity and ecology in the forests, and not to be valued in commercial terms, the overall availability of bamboo and its yield and resultant income from sale by Forest department is pathetically low. This is a resource waiting to be tapped and developed, even assuming many sq kms of bamboo must be untouched for ecological reasons, as in National Parks and Sanctuaries.

There are two main reasons for this current situation.

First, for historical reasons, the focus of Forest department was on developing timber resources. Bamboo was treated as a poor man's timber to give away to local needs. Most bamboo was sold to the paper mills on long term contract in all States of India. The relationship of the State Forest Departments and paper mills, which was stable for almost fifty years, changed only after 1990s, when paper mills changed their raw material sourcing strategy. The post 1991 liberalization also helped the paper mills to reduce their dependence on contractual bamboo from forests, go for imports of raw material if necessary and new paper making technologies also facilitated this change. So, for many decades, no great effort was needed or expected from Forest Department to increase productivity of bamboo. A little part of the bamboo was also sold from the forest bamboo to the contractors operating in bazaar sector for poles etc. This was a minor source of income for forest department. Since bamboo (apart from bulk sale to paper mills) did not have much commercial value, enough attention was not given to it as a source of revenue.

Secondly, more important, bamboo is a grass and is different from other wood species grown in the forests, though it grows along with it. As Shri Ramanuja Rao, the well known expert in bamboo puts it "Bamboo is neither typical forest or typical agricultural product. It is somewhere in between. Foresters are not farmers. The forest department is different from agriculture department which has an extension system. So they tend to treat bamboo as one more 'forest item'. But in reality bamboo

is different from other forest species and needs a strong extension system”.

One understands ‘extension system’ in agriculture. How do we do in forest areas? Is it possible? Will it work and permissible by laws and rules? Well, this is an issue the foresters have to find a way out.

But we cite two indirect examples.

One is little Costa Rica. Reportedly this country is doing well in using bamboo for housing. It has only about 1000 hectares for bamboo. Columbia is well known for bamboo for its high end architecture, is reported to have just 55,000 hectares under bamboo. With these limited acreage they are able to achieve so much or at least claim so much.

In China, by careful extension system post 1980’s the productivity of bamboo increased twenty folds in some areas. This productivity increase happened in both individual farms and forest bamboo. ( Read, for instance, the International Network for Bamboo and Rattan working paper No. 15 on Bamboo in Anji County of China – A Case Study) Yet the message is clear. Whether it is farm land or forest land, bamboo needs conscious care.

Therefore, we recommend that in suitable areas the forest department train and promote households to manage bamboo in forest areas within the framework of their existing guidelines and working plans.

This could start in areas around burud settlements *where people have a stake in bamboo*. Forest department can demarcate certain areas, where communities can harvest bamboos for a 5-10 years, a sort of leasing arrangement, under overall technical guidance of Forest department. This can be through the JFM route or PESA route, whatever is relevant to that area. The working plan etc has to be woven around the fact that the bamboos will be protected and maintained by the community. This will be a win- win solution fetching higher revenue to both Forest department and increase the income of community around.

The second is need for substantial funds for general cleaning and removal of bamboo from time to time within the forests, popularly known as ‘proper management of bamboo clumps’. In fact the change of old arrangement with paper mill which was for decades has created a

new set of challenge, which the Forest department needs to address very quickly particularly in Gadchiroli districts. We recommend additional allocation of budget for this purpose. The revenue earned will be many times of the expenditure initially incurred.

These two steps, namely providing adequate budgetary funds for timely and good quality management of bamboo within forests and allowing communities to manage certain earmarked hectares for long periods, will increase the quantity and quality of bamboo. This will make available huge quantity of bamboo for downstream uses in 5 to 8 years.

#### **4.6 . Commitments regarding availability of bamboo:**

Why is bamboo sector not developing across the country in spite of the efforts taken in last two decades? The answer should be obvious. There is no certainty about raw material availability both quantity and quality. Even in North East States where the general perception is that bamboo is 'abundant', the experience of those who want to set up bamboo board or similar units is that clarity on raw material availability is not there. On the surface all looks ok and attractive, but when an entrepreneur does due diligence there are many uncertainties regarding raw material. Any number of bamboo promotion seminars can be held, but no entrepreneur will come forward to start a bamboo based unit unless he is sure that a certain quantity of raw material is available for a period of years and at certain rates which he broadly knows beforehand. Earlier, the great paper mills came up in whole of Central and Western Ghat area only because they were sure of raw material availability for a long period from the Forest Department.

One solution is that downstream units source their bamboo from farms. The subject of farm bamboo is being addressed in a later part of this report. Farm bamboo may be most suitable for units which go for high end uses like furniture, housing, crafts and the like where quality of bamboo is more important than quantity.

But there are a range of other engineered products and downstream uses of bamboo where 'quantity' is required and quality requirements may be secondary.

From the supplier side, forest department also need to dispose of their bamboo, as bamboo clumps have to be scientifically managed, that is 'removed ' from time to time. **That is forest department also needs assured purchasers and good buyers. Then why not Forest department carefully and consciously plan their disposals to properly develop this sector?** This is certainly widening the role of Forest Department from what it has been so far doing , but then changed times require changed roles.

So there is an urgent need for Forest department to address this issue in a professional and serious way. Forest department need to calculate and state, up front, how much bamboo is available or can be made available for different categories of downstream units for say next ten years. A rider can be put that after a certain period, no assurance of bamboo is given and the units have to source from farm bamboo, as it takes some time to develop farm bamboo sources.

We recommend that Forest department work out how much bamboo can be made available broadly for following categories (indicative ) of down stream uses. They can also prescribe ratios/quotas for each categories, to extent possible.

- a. For bamboo as nistar rights – for meeting needs of artisans – the targets , etc as already given above
- b. For bamboo as full poles for housing , furniture and such downstream units and the like
- c. For bamboo engineered units like bamboo boards etc
- d. Bamboo , as bundles , for bulk consumption by paper mills.

We recommend that forest department do a proper ten year planning. They may even engage consultants (from UNDP etc) for this purpose , if required, for an independent third party rigorous assessment. **. There is also need to introduce new types of bidding processes.**

We also recommend that just as there is reservation in Government for different groups like SC/ST/VJNT etc and competition is only within members of that category, so also there must be broad commitment for bamboos-- category wise, and bidding must be only from that category of registered buyers. We recommend that there must be various



categories of registered buyers. That is there must be separate 'quotas' for say bamboo engineered units or long poles for housing units etc. This will prevent a stronger category of bidders (like paper mills ) taking away the bamboo earmarked for bamboo engineered units, if they are to come up. Only then entrepreneurs will come forward and start units. This assurance can be given for say ten years. Assurance like sales tax concession or other concessions are given by Industries Department to promote and invite investments all across State. Specific concessions are given to emerging sectors like IT or electronics. Why not for bamboo sector?

So, forest department needs to take a proactive role in this matter, and the formation of the Bamboo Board will, hopefully, facilitate this.

#### **4.7 Role of FDCM**

It is good news that FDCM has taken up bamboo cultivation in a big way. They have sourced funds from National Bamboo Mission, WCL etc. As per their presentation they have planted bamboo in about 27, 541 hectares. Being a commercial organization they have more flexibility in their operations. **However, it is seen that they dispose of their bamboo without any value addition or keeping any end use in mind.** Being a public institution, they need to get associate in implementing the suggestions given above, without compromising on their commercial viability. **So FDCM can also play proactive role in selecting some sectors like housing, crafts and the like and give them** good quality assured bamboo by earmarking quota for categories of bidders. As already indicated above, FDCM must be involved in the Bamboo Board effort which will prepare a ten year plan for bamboo sector in the State.

#### **4.8 Revisiting the 21.2.2014 Government Resolution :**

The prevalent guidelines on disposal of bamboo given in GR 21.2.2014 needs an immediate revisit as there are implementation problems relating to it. The GR only provides for disposal of bamboo bundles.

## **5 Bamboo – impact of Forest Rights Act (FRA) and Panchayat Extension to Secheduled Areas(PESA) and way forward**

Two landmark Acts have been introduced post 1990s but their impact is seen day by day. One is the Forest Rights Act, 2006 and the other is Panchayat Extension to Scheduled Areas Act, 1996. Both Acts with related Rules are slowly but steadily bringing tectonic changes in the bamboo arrangements in the forest areas, and **in the relationship between the department and the villagers around forests.**

In addition, to these two Acts in Maharashtra two important notifications have been issued by the Hon Governor on 19<sup>th</sup> August and 30<sup>th</sup> October , 2014 under his powers for Scheduled Areas conferred by the Constitution. In view of these notifications, for Scheduled Areas (PESA) bamboo is included as a MFP. Further, the restriction put on bamboo as a ‘tree’ in the Indian Forest Act will not be applicable at least as far as Scheduled Areas are concerned. The transit passes are also to be issued by the Gram Sabhas.

Substantial hectares have come under Community Forest Rights (CFR) as conferred by the FRA. Further, the GR dated 23<sup>rd</sup> November 2015 issued by the Rural Development Department details the method and manner of disposal of bamboo by the community in PESA areas. It is observed that in the last two years- particularly in Gadchiroli more and more villages are opting to sell the bamboo on their own. These are earlier days of the new arrangement and it will take some time to see the impact of these new developments, positive or negative. However, the first feedback is positive. In summer 2015 about twenty villages in Gadchiroli have earned their first lakh of rupees by selling their community bamboo. For the first time they are seeing such a huge income.

The best bamboo areas of the State at present namely Gadchiroli , followed by Chandrapur are now substantially under PESA .

Any transition period is bound to create disturbances and dislocations. It must be admitted that the new arrangements of community ownership and management has not fully stabilized. **However, our Committee is of the view**

**that the new realities must be accepted as given and reflects ‘spirit of the times’.** Forest department needs to reposition itself in the PESA and FRA area in a new way. Possibly even the Social Forestry department has a big role to play.

We recommend the following:

5.1 A lot of capacity building classes regarding proper bamboo cutting and management be held in the PESA and FRA areas, so that there is no complaint of destruction of bamboo culms by the community etc. One way is to identify a person from the community, , to guide the villagers in proper bamboo cutting practices. He will be the Forest department’s authorized technical guide and representative in the village settlement. He will be someone like what Police Patil is for the police department .

5.2 A small video film should be professionally made on community role in PESA and FRA- dos and donts. This film can be widely shown in rural areas.

5.3 The present TP arrangements needs to be revisited. The same type of TP format is being used for PESA, FRA and for giving to forest contractors. Different formats and different colour books need to be devised for each specific category of users.

5.4 –The Central Government (Ministry of Tribal Affairs) has come forward with a MSP for bamboo and other NTFPs. The picture is not clear in Maharashtra. In Maharashtra , the nodal agency is the Tribal Development Corporation. The State Government should use this offer of Central Government for fixing the MSP, get required support funds from Centre and incentivise bamboo sale.

5.5 There is a complaint that while community can issue TPs in PESA areas, actually the printed blank books are not made available to them by the department. The GR dated 23<sup>rd</sup> November 2015 of the Rural Development Department makes it clear that the Transit Permit Pass Books can be printed and distributed to the village communities by the

District Guidance and Grievance Committee, headed by the District Collector and co chaired by the CCF.

5.6 As indicated above, **a new type of relationship is emerging between the community and Forest department, at least as regards bamboo, very different from what prevailed for decades.**

This new arrangement of officials to work with non officials and public in partnership has stabilized in the rural areas of Maharashtra since 1960s in the Panchayat Raj system – the Zilla Parishads, Panchayat Samitis and Gram Panchayats. They are vibrant local democracies. But for Forest department it is indeed a new experience and new arrangement. Therefore, there is need for training at the cutting edge level of RFOs, Inspectors and Guards. In fact, new indicators of good performance need to be defined and included in the annual performance appraisal (CRs) of forest officials, more particularly at the field level. At present their 'work performance appraisal' is in a different mould. For example in PESA areas, the Forest department functionary could be assessed on number of locations where they have managed to increase the community income but without any loss or damage to any forest resource.

5.7 The PESA and FRA opens up new great opportunities if the stakeholders decide to work together in a symbiotic manner. It can bring in big increase in income for the forest dwellers, without destroying the Forest system in any way. At present there is more blame game. There is need to introduce a good long term project (5-8 years) to improve capacities of all stake holders ( Foresters, Rural Development functionaries, community leaders ) learn to move ahead in a participative decision making process. Funds should be easily available from international agencies like UNDP, IFAD or even from Government of India provided the project DPR is placed before them. For preparing a good project proposal, we recommend that Forest department engage a good consultant (individual or institution) soon.

## 6 Promotion of farm bamboo:

Bamboo has been victim of wrong definition and classification in Government. This goes back to the British days. It was treated as a 'forest' product, even though it grows freely in farm lands in abundance in many parts of India. So it was not 'touched' by agriculture department since Independence. As a result it was never consciously promoted by either agriculture or forest department, **outside the** forest areas.

In Maharashtra, bamboo was included as a specie for 'block plantation' under State EGS funded activity by the Social Forestry department till a few years back. Its impact has been miniscule, just a few hundred hectares in two decades. Social forestry department has hardly any proper documentation on the success or failure of block plantations.

Bamboo was also included as an item under EGS- horticulture programme by the Agriculture department, but once again it did not take off. Neither were agriculture department equipped to handle bamboo in all its aspects.

Barring these two schemes (with achievement in few hundreds of hectares, that too many years back) there is no dedicated scheme for promotion of farm bamboo.

In fact there is no incentive for the farmer to go for bamboo block plantations as there is no assured or organized market. Besides, there is also the major problem of getting Transit Pass (TP) to move his produce.

However, where there is assured market the farmer will grow or nurture bamboo either as backyard scattered plantation in the edge of his field or as block plantation, with or without irrigation. The success story of sale of the manga ( *stocksii* ) bamboo saplings in Sindhudurg Kudal Social Forestry nursery ( funded by NMBA) shows the immense hidden potential of bamboo.

In international seminars, the great success achieved by Costa Rica in growing guadua bamboo and immediately putting it for use in housing is well documented. Likewise, the success achieved by China in remarkably increasing the production of bamboo in two decades in farm sector with their quick absorption by Town and Country Enterprises are repeatedly

highlighted. There is no reason why Maharashtra cannot be a leader in promoting farm bamboo which has multifarious uses.

### **6.1: Promoting intense bamboo farm clusters:**

For this purpose, we propose, that instead of spreading efforts thinly, about 10-15 clusters of 15 to 20 villages in 10-15 tehsils ( out of total 350 tehsils) must be chosen for intensive bamboo development. These clusters /tehsils should not be chosen arbitrarily, but need to be chosen carefully on the basis of weightage points for :

- Availability of bamboo stock in farm and field- that is there is an existing culture of bamboo. It is easy to develop such clusters ( found easily in Gondia, Sindhudurg, Palghar etc) rather than in new areas
- Skill level in using bamboo at present
- Market for bamboo products.

Thereafter, bamboo must be developed intensively in this area, using MGNREGA funds and from other available schemes . Thus Social Forestry may open a nursery and distribute planting material. They must position a cluster officer to do the linkages, including develop an organized bamboo market. In addition, Government may work out a scheme of MSP for bamboo grown in these parts, to encourage its cultivation in the first round.

It may be recalled that the Green revolution started in agriculture by focusing only on very selected areas/districts in the 1960s. We are proposing a similar intensive strategy.

In addition, if other resources are pooled, a bamboo culture develops in the area, with an ecosystem for bamboo in all its dimensions to flourish. Needless to repeat, these blocks must be chosen carefully where results can be quickly seen.

In these areas we propose bamboo industrial parks, where bamboo based units can start to promote employment. Details are given in a later part of this report. We also visualize a critical role for the proposed Maharashtra State Bamboo Promotion Company in this effort.

## **6.2: Removal of restriction on farm bamboo movement by withdrawal of TP system:**

We feel the biggest restraining factor for farm bamboo is the TP arrangement, which restricts the farmer to grow and transport bamboo. In the next part of this report, we have dealt on this subject.

### **7 Revisiting and reconsidering the Transit Pass guidelines:**

As per Section 2(7) of Indian Forest Act, 1927 'tree' includes 'bamboo'. Section 2 (6) defines 'timber' as trees when they have fallen or felled. Thus bamboo when felled, falls within the definition of 'timber'. Further Sec 2(4) defines forest produce as those items whether found in, or brought from a forest or not. It includes 'timber' along with a number of items mentioned under Section (2) (4) (a) of Indian Forest Act 1927. Thus bamboo whether found in or brought from Forest or not is Forest Produce.

**As per Rule 31 of Maharashtra Forest Rules, 2014 transit of forest produce requires a valid pass.** Hence for the movement of bamboo, transit pass is required. As per Section 41 of Indian Forest Act, 1927 the State Government is empowered to frame Rules to regulate the transit of forest produce.

In 2012 and 2013 the Forest Department simplified the transit pass regime, and exempted all bamboo species other than *Dendrocalamus strictus* and *Bambusa* bamboos from transit pass throughout Maharashtra. Further the issue of transit pass exists now in ten districts. However, the Committee is of the view that specie identification is a highly technical skill. It is very difficult for the public or farmer to prove that he is moving a different specie other than the two restricted species. Moreover, if the prevalent guidelines are studied carefully, they prevent easy movement of bamboo into big cities, like Greater Mumbai, Nasik and Nagpur. There are the locations where big consumption of bamboo actually happens. Thus TP really acts as a disincentive for use of bamboo. In view of the difficulty in getting Transit Pass and the constant apprehension regarding search, many farmers are disinclined to grow bamboo.

We are of the view that there is a strong case for doing away with the Transit Pass regime altogether. There are a number of High Court and Supreme Court judgments treating bamboo as a grass and MFP and not to be treated as a typical forest produce like timber. In fact, growth of farm sector bamboo is hampered by these restrictions.

However, the Forest officials in the Committee strongly felt that the TP arrangements should continue to prevent theft and save the bamboo stock within forests. They suggested as a via media that the Gram Sabha must be authorized to grant permission for felling as well as issue of TP for transportation of the above species of bamboo in the above mentioned ten districts.

Hence no consensus could be arrived at by our Committee in the matter. However, most of the members are of the view that specie wise restriction is totally impractical and does not change the ground realities. A much more easy arrangement is required and the restriction of bamboo movement into Greater Mumbai and Nagpur without TP is required to be withdrawn as they are big consumption points.

## **8 Promoting the bamboo sector:**

A new sector has to be carefully and consciously nurtured and promoted. Funds constraint is always there. We have shortlisted few activities, which if done strategically will push the bamboo sector forward in a few years. We visualize some of it to be implemented through the initiative of bamboo board (but can be implemented by other Government agencies) and most by the Maharashtra State Bamboo Promotion Agency (MSBPA) which we have mentioned earlier.

**Where the risk involved is high and one needs to work on commercial and market principles, then the work must be ideally assigned to MSBPA.**

### **8.1 Promoting integrated bamboo clusters**

In earlier paragraph (see 6.1) we have mentioned promotion of farm bamboo in a big way in about 10-15 clusters. We have also indicated the criteria in which these clusters are to be chosen. At the risk of repetition, we suggest that these clusters should be contiguous area of 15-20



villages within a block. It could be about two Panchayat samithi's constituencies (Ghat) . These could also be in areas where there are forests, so that forest bamboo and farm bamboo complement one another. The main criteria is that there should be an enabling environment for bamboo in terms of some skill, some market etc. To give an instance, the village Behali situated 10kms near Parathwada is already well known for its bamboo products. There are a number of burud families living there. It is close to the great Melghat forests. Parathwada is a strategically located important bazaar town for rural products and has a forest depot. A cluster around Behali/ Parathwada, if delineated and developed can develop very well.

The study of the success story of China shows that raw material availability and follow up value addition should happen, ideally in a 30 sq km area. Then only bamboo products can be economically viable and competitive. Therefore 'backward and forward linkages' should be consciously promoted in these clusters. Raw material availability must increase by cultivating farm bamboo ( supplemented by forest bamboo) while parallel ly skill sets and end use units must be encouraged. The Government can earmark one or two places in local MIDC/industrial estate as 'bamboo industrial estate' in these areas in such ventures. We propose that a certain sum be kept for Common Facility Centres (like treatment plants, polishing units) for each of these clusters. The funds could be from DPDC/SC-ST welfare and/or any other such source. It is this initiative which will push the bamboo sector in the State. The proposed Maharashtra State Bamboo Promotion Company (MSBPC) can also actively work in promoting some of these clusters.

## **8.2 Promotion of organized bamboo bazaars in various locations:**

One limitation for bamboo is that there is no organized market for bamboo poles etc. It is going on in traditional way. There is scope for actively promoting bamboo bazaars in select location in the State. The MSBPC or Bamboo Board needs to actively promote at least 5 to 10 organised bamboo markets across the State, on lines of APMC. Key components of an 'organised market' for bamboo are as follows:

- A proper location, place and time when buyers and sellers can meet
- A general awareness about existence of this market
- A system of grading and classifying bamboo for helping buyers
- Value addition like treatment plant if possible
- User fees for the promoting agency to make the project sustainable

We recommend established but unorganized bazaar locations like Parathwada, Wadasa Desiganj, Aheri, Etapalli, Panderkawda, Kalyan, Nagbeed/Mul as possible suitable places for developing the bamboo bazaars in the first round. There can also be three monthly/annual fairs where special products of bamboo are brought for sale.

### **8.3 Use of bamboo in selected settlements to demonstrate the use of bamboo in housing:**

In PESA areas the community has become the 'owner' of harvested bamboo. It is not necessary that all these bamboo must be sold. In PESA villages, as a demonstrative effort, we recommend engaging a professional architect of repute and help the villagers build their own houses using bamboo as much as possible. There will be modern, good quality houses, much superior to the traditional bamboo houses. Thus this will be integration of both traditional material and modern design. Such project can be funded under special scheme of Tribal Department or from Indira Awas Yojana under special pilot project. We recommend about 1000 houses to be built in various parts of the State, possibly in twenty locations- mostly tribal areas- to demonstrate the use of bamboo for new type of housing and settlements.

### **8.4 Separate DSR/CSR for bamboo:**

The main difficulty in bringing bamboo into the construction/housing sector is absence of DSR/CSR for bamboo. Already good work has been done at the national level due to initiative of NMBA and other agencies. However, they have not percolated down and there is lack of communication. We recommend constitution of a permanent standing

committee which will give standard costs for bamboo items for use by end use departments or other public agencies. Even if some low end bamboo items are used in housing and construction of Government structures, it will make a good beginning as Government and its agencies constitute the biggest single consumer in the market.

### **8.5 Use of bamboo in tree guards:**

It has been a State policy to encourage production of certain items or by certain categories of people. Till 1990s there were many reservations for small scale sector. There are positive and negative sides to such reservations, as there is often misuse of a facility. Slowly with onset of liberalization the reservation, permits quotas and licences have been done away with.

However, in case bamboo is to be promoted there is need for bulk purchase. We recommend that Government must give instructions to all agencies that tree guards must be only made of bamboo to promote local employment and eco friendliness. We also recommend the following related points:

- Nagar Palikas, Gram Panchayats must use only bamboo based tree guards.
- The Nagar Palikas may also introduce replacement guarantee clause. That is, if the tree guard gets damaged in short period from the same bamboo tree guard suppliers, as this is the main complaint about bamboo tree guards 'they do not last long'. Model tender documents can be circulated by the Bamboo Board.
- The type design may be given by Government and the permanent CSR Standard cost committee mentioned above may also circulate the indicative price range for tree guards from time to time to help in the bidding process.

### **8.6 Usage of bamboo in furniture:**

As an extension of the proposal placed above, we recommend that bamboo furniture items be used in Government system. To start with we recommend that 40 % of furniture purchases in Forest guest houses and offices can be sourced from bamboo and 20% in other

departments in a staggered manner. The tendering procedure needs to be streamlined accordingly. This arrangement can be for a period of ten years.

#### **8.7 Gadchiroli Agarbathi Project to be registered as a separate company under the Companies Act:**

The Gadchiroli Agarbathi Project (GAP) is a unique initiative and has been well appreciated. However, there is no institutional structure. We recommend that it be registered as a separate not for profit company with same management so that it can work on sound financial principles. Another option is to register itself as a cooperative or Producer Company. We recommend that Bamboo Board quickly take initiative in this matter.

#### **8.8 : Empanelling architect and partner institutions:**

At present, a number of designers and architects are interested in the bamboo as a material and would like to explore it and use it for their clients. However, they have professional constraints and do not have time or energy to search for this raw material. They want it 'off the shelf' like any other material, in properly treated form. However this is not possible at present. We propose empanelling architects, designers and the like who would more linkages with bamboo producers and bamboo sources.

#### **8.9 Proper inventory of bamboo craftsmen, master trainers and others in the trade:**

The people associated with the bamboo sector are scattered. There is urgent need to prepare a soft and hard copy of a 'Bamboo Trade Directory'. Tripura Bamboo Mission has done this. MSBPC is best equipped to handle such projects.

#### **8.10 Promoting bamboo among architecture and design students:**

Bamboo is both a material of the past and material of the future. Every year, a few students in architecture schools get interested in bamboo. But due to professional and career constraints they are

unable to sustain their interest. Availability of some scholarships for interested students will help them to work on these materials for some period. This will induce new talent and freshness into this sector. At present there are very few (almost miniscule) people in this line. We propose a few scholarships and fellowships for architects and designers who would like to work in this sector for say 2-3 years. Such an approach is common in academia, but we are proposing this for bamboo sector as well.

As a part of this initiative we also recommend development of a three day 'Bamboo exposure' module for students of schools of architecture, and design. Orienting each batch of architecture students through such short modules will go a long way in promoting the idea of bamboo among those who matter.

#### **8.11 Partnership with skills studio in IDC, IIT:**

The contribution of Prof A G Rao, Professor in IDC who developed the Bamboo Studio in IIT Mumbai is well known. We recommend more partnership projects with IDC design Centre in IIT Mumbai. This will give opportunities and markets to those who want to work on high end craft products.

### **9 Human Resources for the Bamboo Sector:**

If bamboo sector is to grow, then talented and skilled man power is required for handling and running bamboo units, and taking it forward. Traditionally, bamboo craft was practiced by hereditary artisans mainly from the burud community. It was also a generic skill among tribal communities. However, this will not suffice for new needs.

The difficulty is that it is a natural occurring specie with botanical properties, but has varied uses as construction material, craft item, engineered material and it needs some treatment etc. Therefore it is difficult to pigeon hole it. So a specific course has to be designed to teach it to interested students. Our Committee's field visit to Tripura shows that there is no precedent and the entire syllabus has to be framed first time and evolved as one goes along. This will be the first of

its kind in India. The sector will not grow without skilled hands, but young students will not venture into a bamboo course unless there is an assured job opportunity. It is a chicken and egg problem.

But we feel that if the sector is to develop, then proper HR development is required and we need to plan from now.

We are happy to know that even before the constitution of this Committee (July 2015) the Forest Department has decided to develop a training centre at Chinchpalli. We make the following specific recommendations:

### **9.1 Bamboo structures at Chinchpalli Training Centre, Chandrapur:**

Our Committee **recommends** that the entire campus at Chinchpalli, Chandrapur belonging to the Forest **department must be developed using buildings and structures which uses local bamboo substantially.**

This will show case the potential of bamboo as a construction and structural material to the region and society at large. It will also give a sense of pride to the people of Chandrapur and Gadchiroli who use bamboo substantially in construction.

**We recommend that the bamboo structures at Chinchpalli must be an outstanding building and attract visitors.** Hence, we recommend that the architect who designs the building must be identified by international or national competition.

To save procedural time, the Government **may consider identifying a sponsor** who may meet the costs of the architect. In that case the sponsor must be given the option of handling the competition or alternatively, identify a suitable architect by direct search. A suitable mechanism must be devised for this.

The Chinchpalli campus must be used for bamboo training, common facility centre and possibly a small bamboo museum. For full utilization of the capacity created there, Forest department can also use it for internal training of their staff or hire it out to other departments.

### **9.2 Nature of the training to be provided at Chinchpalli:**

Our Committee deliberated on the training that is needed for development of bamboo sector in the State. **It welcomed the 45 day**

**training course** started in bamboo skill development and artisanship in collaboration with Bamboo & Cane Development Centre, at Agartala. ( Development Commissioner, Handicrafts, Government of India). It noted that it reasonably popular and patronized substantially by the burud community in that area. It also noted that the institute is entering into MoU with Tata Trust for HR and Marketing support.

While continuing the present course, **our Committee is of the strong opinion that there is need to start a dedicated course to meet the needs of bamboo enterprises and units ( big , medium and small) which may emerge in the future.** In fact, the feedback is that absence of competent Human Resource is a limiting factory in emergence of the bamboo industry. Just as starting of diploma courses in civil engineering, mechanical engineering in the 1950s and 1960s helped growth of manufacturing sector in India, this diploma course will also help push bamboo sector growth.

**We recommend a Diploma Course with following details:**

- Course should be between two to three years, as required by the Maharashtra State Board of Technical Education (MSTE)
- In long term, it should be accredited by the National Board of Technical Education, which is a long drawn process. To save time and get the course started the MSTE approval is felt adequate
- **We recommend an initial intake of twenty students per batch,** with adequate reservation to local candidates. We are confident that the students will get adequate job opportunities in the sector or start as entrepreneurs
- We recommend that the course should be in five six modules, with one module for construction, one for handicrafts, one for botany, one for engineered products, and one for basic English and Maths skills and the last one on entrepreneurship skills. The module courses will be hands on in the field with existing institutions/business units across India , with the centre at Chinchpalli restricting itself to coordinate the course . This will dispense with the need for elaborate infrastructure at Chinchpalli and save valuable resources. Instead the TA/DA for the students need to be substantial increased for their long months of field

training. Thus it will be a new type of bamboo diploma course with low investment on campus or staffing but high expenditure on field training .

- **We recommend that the course must be started by educational year of 2017-18**
- This will be the first such course in India, and very unique. It is likely to attract substantial attention. We recommend that suitable steps be taken immediately to get the course started, which will be most relevant to Maharashtra.

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## **ACKNOWLEDGEMENTS:**

The Committee would first like to thank Hon Shri Sudhir Mangantiwar, Minister for Finance, Planning and Forests. It was his idea and initiative that a Committee be set up to study the bamboo sector in depth and give a road map for its development.

The Committee also thanks the **State Minister for Forests, Shri Raje Ambarishrao Atram**, for his support.

The Committee would like to thank the officers and staff in Forest Department, Mantralaya and in PCCF HOFF office at Nagpur who gave all the logistical and office support and facilities for the meetings and field visits. It would like to specially record the support given by Shri A.S.K.Sinha, Retired PCCF, Mr.B.P.Singh, Addl PCCF and Mr. P.K. Mahajan, Joint Secretary in Mantralaya. It also thanks Shri TSK Reddy, who has taken charge of the new Bamboo Board and overseen the printing of this report. They were also official members of the Committee.

The Committee also records its thanks to the Special Invitees who came to Nagpur on our invitation and shared their experience and gave suggestions. It would like to specially mention:

Prof A.G.Rao (IIT Mumbai)

Dr Ramanuja Rao, earlier with INBAR China

Christiana from Latin America with long experience in bamboo housing

Tata Trust officials (always backing us and giving required support)

Officials of National Bamboo Mission, Delhi

Smt Lekshmi Sukumaran, Architect and scholar with IIT Mumbai

Shri Saleem , Forester, who has set up a model bamboo nursery in Amravati

Mr.Jayagopal, renowned Architect, Cochin

Mr.GRK Rao, FDCM

Mr.Subodh Kulkarni, Kolhapur

The Committee also would like to record its thanks for the following experts who contributed to framing indicative syllabus for bamboo related courses:

Dr. Bakde from VNIT, Dr Modak and Dr Khope from Priyadarshini College of Engineer, Dr Ilorkar for Punjabrao Krishi Vidyapeeth- Akola, Shri Dileep Halde of VEDHA, Nitin Junonkar Principal ITI, Chandrapur and also Shri Abhay Wagh. Director, Maharashtra State Board of Technical Education and his support officers.

The Committee also records the guidance and inputs received from Shri Manohar Sapre, Chandrapur, who has inspired many to take up the cause of bamboo over the years and many others who enthusiastically shared their views and gave inputs.

The Committee also records its thanks to Mr.George Jenner and his team of Tripura Bamboo Mission for their hospitality during our visits to Tripura and to AB Composites, Calcutta .

The Committee would also like to place on record its thanks to the Vidharbha Bamboo Parishad for inviting us to their meeting in December 2015 and giving their inputs.

# ANNEXURE - 1

## BAMBOO STATISTICS IN BRIEF:

Total area of Maharashtra: 3.08 lakh sq kms

Total area under Forests: 61939 sq kms ( 21% of the total area of State)

### **Other relevant Forest statistics:**

Area under overlapping working circles: 9479 sq kms

Actual estimated area under bamboo: 4, 74, 915 Hectares or 4749 sq kms ( at 50% of the overlapping working circle area ) or roughly 4800 sq kms

### **Analysis of the area under bamboo cover:**

Category	Area ( in sq kms )	Percentage to total
Under Community Forest Rights	615	12%
Under PESA	2739	57%
Other than above	1395	31%
<b>Total</b>	<b>4749</b>	<b>100</b>

### **Categorisation of bamboo forests :**

Dense bamboo is defined as 200 and above clumps per hectare.

Medium dense bamboo is defined as 50- 200 clumps per hectare.

Scattered bamboo is defined as 1-50 clumps per hectare.

### **Bamboo plantations raised in Forest department during the last five years:**

Year	Total Plantations raised (in Hectares)
2010-11	3702
2011-12	3851
2012-13	4006
2013-14	4259
2014-15	3156
Total	18974 ( or 189 sq kms)

### **Bamboo production and revenue**

Year	Production		Revenue ( in Rs. lakhs )
	Poles ( in lakhs)	Bundles (in lakhs)	
2012-13	39.13	802.37	1558
2013-14	26.88	89.44	418
2014-15	24.73	14.26	258

**Sale of bamboo to traders by auction route:**

Year	Bamboo Poles (lakhs)	Bamboo Bundles	Value ( Rs) In lakhs
2012-13	37.01	60,771	581
2013-14	17.54	35,478	388
2014-15	12.87	61,781	287

**Supply of bamboo to paper mills**

Year	Quantity ( lakh MT)	Value ( in cr)
2012-13	1.23	9.85
2013-14	0.11	1.66
2014-15	--	--

### Bamboo poles provided to buruds and others (nistar)

Category	2012-13	2013-14	2014-15
Registered Burud & other families	13261	13604	6024
Total bamboo provided to buruds and other families	9.92 lakhs	8.48 lakhs	5.75 lakhs
Total income by sale at nistar rates	1.64 crores	1.35 crores	0.78 crores

### National Bamboo Mission in Maharashtra :

The social forestry Directorate is the nodal Directorate for this programme. A total amount of Rs.13.545cr. was received under the National Bamboo Mission (Ministry of Agriculture, Government of India) during the period 2007-18 to 2014-15 for bamboo sector in Maharashtra. The main recipients are (a) FDCM: 3.3cr, (b) Forest dept : 1.44cr (c) Social Forest : 1.44 cr, (d) Various NGOs : 1.25 cr . The FDCM seem to have brought 1975 ha under bamboo with NBM assistance.

## Selected statistics of Forest Development Corporation of Maharashtra (FDCM):

### 1. MANAGEMENT OF NATURAL BAMBOO FORESTS

#### NATURAL & ARTIFICIALLY REGENERATED BAMBOO AREAS

Region	Natural Bamboo Area (in Ha.)	Planted Bamboo Area (in Ha.)	Total Bamboo Area (in Ha.)
Nagpur	14948	14323	29271
WFP & Afforestation	0	3521	3521
North Chandrapur	26676	6314	32990
South Chandrapur	6570	528	7098
Nashik	1952	2855	4807
Total	50146	27541	77687

### 2. FDCM- National Bamboo Mission: YEARWISE PLANTATION TARGETS AND ACHIEVEMENTS

YEAR	PLANTATION	
	TARGET (Ha.)	ACHIEVEMENT (Ha.)

2008-09	650.00	0.00
2009-10	120.00	650.00
2010-11	225.00	120.00
2011-12	0.00	225.00
2012-13	980.00	0.00
2013-14	0.00	980.00
2014-15	0.00	0.00
2015-16	0.00	0.00
TOTAL	1975.00	1975.00

### 3. Details of Bamboo Plantation Area in FDCM Ltd.

Sr. No.	Region	F.P.D.	Management Plan wise total area (Ha.)	Under Bamboo overlapping W.C. total area (Ha.)	Net Bamboo area (Ha.)	Remarks
1	2	3	4	5	6	7
1	Nagpur	Nagpur	22099	7514	2249	Area is less due to some of the area handed over to Wildlife wing of FD.
		Bhandara	11101	2022	1135	Area is less due to some of the area handed over to Wildlife wing of FD.
		Gondia	31483	12933	10998	Very Good
<b>Total</b>			<b>64683</b>	<b>22469</b>	<b>14382</b>	
2	North Chandrapur	West Chanda	31135	13049	13049	Very Good
		Central Chanda	23938	29423	9423	
		Bramhapuri	30133	4204	4204	
<b>Total</b>			<b>85205</b>	<b>46676</b>	<b>26676</b>	
3	South Chandrapur	Pranhita	25451	743	743	Very Good
		Markhanda	26836	5855	5855	
		<b>Total</b>	<b>52287</b>	<b>6598</b>	<b>6598</b>	
4	Nashik	West Nashik	42075	2141	190	Very Good
		Thane	20016	0.00	0.00	
		Dahanu	24465	0.00	0.00	
		Nandurbar	17482	0.00	0.00	
<b>Total</b>			<b>104039</b>	<b>2142</b>	<b>190</b>	
5	WFP & Aff.	Yeotmal	31627	920	920	Very Good
		Kinwat	15766	1376	500	Small size bamboo
		<b>Total</b>	<b>47393</b>	<b>2296</b>	<b>1420</b>	
<b>Grand total (1+2+3+4+5)</b>			<b>353607</b>	<b>80180</b>	<b>49266</b>	

4. FDCM-BAMBOO PRODUCTION IN LAST THREE YEARS

Sr. No.	Region	Bamboo Production in 2012-13		Bamboo Production in 2013-14		Bamboo Production in 2014-15		Total	
		Quantity in Nos.	Revenue (Rs. In lakh)	Quantity in Nos.	Revenue (Rs. In lakh)	Quantity in Nos.	Revenue (Rs. In lakh)	Quantity in Nos.	Revenue (Rs. In lakh)
1	2	3	4	5	6	7	8	9	10
1	Nagpur	2116776	392	1640490	311	1441033	243	5198299	947
2	North Chandrapur	3132681	545	2883362	551	5853355	1340.79	11869398	2437
3	South Chandrapur	589630	303	133183	220.31	694755	51.28	1417568	575
4	Nashik	74410	10	60170	3.93	0	0	134580	14
5	WFP & Aff.	173191	17	28340	1.92	48021	4.65	249552	23
<b>Total</b>		<b>6086688</b>	<b>1267</b>	<b>4745545</b>	<b>1089</b>	<b>8037164</b>	<b>1640</b>	<b>18869397</b>	<b>3996</b>



## **ANNEXURE - 2**

### **Constitution of Committee for suggesting measures to have extensive and comprehensive Bamboo Policy**

#### **GOVERNMENT OF MAHARASHTRA**

##### **Revenue and Forest Department**

**Government Resolution No. BBS-2015/C.No. 241/F-9**

**Mantralaya, Mumbai-400 032**

**Dated : 24<sup>th</sup> July, 2015**

**Read :-** Government Resolution No. EST-2013/C.No. 64/Part-2/F-9  
of Revenue and Forest Department dtd. 4-12-2014

#### **INTRODUCTION :-**

Bamboo is most important forest product and the bamboo has the important position in rural and tribal lives near the forests. The livelihood of rural and tribal people near the forests depend on bamboos and bamboo based small scale industries. The use of such well familiar bamboos is being made for domestic use, fencing, agricultural work, various handicrafts articles like, matting, winnowing baskets, baskets, ladders, construction material, furniture and various handicrafts. Presently, as the craftsmen doing bamboo business are using traditional method, they do not get financial income in the proportion of their labour.

Out of forest areas in Maharashtra, the bamboo is found on near about 13% areas. There is nearly 2,30,000 M.Ton bamboo production in the State and out of it, gets more than 90% approx. bamboos in Gadchiroli and Chandrapur Districts. As per Government Resolution dated 4-12-2014, the new Bamboo Policy is declared to encourage the production of bamboos by bamboo plantation and making proper management in natural and private sector as well as the industrialists based on bamboos and to grow valorization utilization of bamboos.

For extensive implementation of new Bamboo Policy, the process of establishment of research and Training Centre at Chichpalli, Distt. Chandrapur is started for bamboo plantation in scientific manner and industrial utilization as well as propaganda. The matter of constitution of the Committee of Experts to suggest measures for effective implementation of this Bamboo Policy was under government consideration.

**GOVERNMENT RESOLUTION :-**

The following State Level Committee is being constituted under the Chairmanship of the Principal Secretary (Rural Development Department) to make the new Bamboo Policy extensive and comprehensive.

1.	Principal Secretary (Rural Development)	Chairman
2.	Secretary (Forests)	Vice-Chairman
3.	Principal Chief Conservator of Forests (Production and Management), Maharashtra State, Nagpur	Member
4.	Chief Conservator of Forests, Gadchiroli	Member
5.	Shri Mohan Hirabai Hiralal, Vrikshmitra, Chandrapur	Member
6.	Shri Sunil Deshpande, Sampurna Bamboo Centre, Lawada, Post Duni, Tq. Dharni, Distt. Amravati	Member
7.	Shri Sunil Joshi, Vedha, Nagpur, Rajyog Tower, Trimurty Nagar, Nagpur	Member
8.	Shri Sanjay Karpe (Konkan), Kudal, Distt. Sindhudurg	Member
9.	Shri Rajesh Yedke, Industrialist, Pune	Member
10.	Shri Vaibhav Kale, Vandargras, Nagpur	Member
11.	Shri Sunil Pande, Ex-IFS, ITC- Hyderabad	Member
12.	Joint Secretary (Forests)	Member Secretary

**Special Invitees :-**

1. Prof. A.G. Rao, I.I.T., Mumbai,
2. Shri Salim Sayyad, Ranger, Central Nursery, Wadali, Amravati,
3. Representative of NMBA,
4. Representative of National Bamboo Mission,
5. Prof. Ramanuja Rao, CIBART,
6. Representative of Tata Trust,
7. Shri Subodh Kulkarni, Kolhapur,
8. Director, Vocational Education,

9. Smt. Laxmi, Bamboo Architect, I.I.T., Mumbai.

Moreover the other Secretaries and Officers as well as other experts will be invited in the Special Invitees as per necessity.

The jurisdiction of the above Committee is being decided for suggesting measures by making study on following points in the context of making the Bamboo Policy extensive.

A) **Bamboo Area Development** :

1. To increase the plantation area of bamboo species giving remarkable production in all fields in the state.
2. To make development and propaganda of bamboo technology in rural areas of the State with the help of traditional knowledge and skill as well as modern technology,
3. To make the nurseries of modern technology for production of bamboo plants.
4. To make improvement encouraging growth in available natural stock of bamboos.

B). **Human Resources and Training** :-

1. To give skill development training to tribal youths in rural areas for creation of employment in bamboo field.

2. To suggest formation and working procedure for Chichpalli Bamboo Research and Training Centre.
3. To suggest syllabus for bamboo training.
4. To arrange workshops, seminars about bamboos.
5. To impart training for management after scientific clearance of bamboos.

C). **Act and Regulations** :-

1. To make amendment in the Rules for cutting, transportation of bamboos.
2. To make the process easy of making bamboo available to Burud and likewise craftsmen.

D). **Bamboo value addition and trade** :-

1. Documentation of traditional technology related to bamboos.
2. To take measures for bamboo process industries, creation of employment,
3. To create basic facilities for storage of bamboos and marketing of produced material.
4. To make the market available for bamboo produced articles and to suggest measures for it.
5. To achieve coordination between the bamboo producers, process industrialists and market and monitoring.

E). **To suggest measures by studying successful schemes in respect of bamboos running in other States.**

As per Paragraph Number 12 in Government Resolution of the Finance Department dated 3-3-2010, the travelling allowance and daily allowance will be admissible to the non-governmental members in the aforesaid Committee. The air fare and the travel by first class A.C. of railway will not be admissible to non-governmental members. Moreover, the meeting allowance will be admissible to the non-governmental members at the revised rate in accordance with the amendment made vide Government Resolution of Finance Department dated 24-5-2012.

As far as the non-governmental members in the Committee as well as the Special Invitees, the approval is being granted exceptionally, to travel by air twice in the country for making study of the Scheme of Bamboo Policy and for measures.

The Proposal to make journey by air for making study outside the country should be submitted to the Finance Department separately.

This Government Resolution is issued with the consent of the Finance Department and informal Reference vide as per Number 103/Service-5 dated 22-7-2015 of the Finance Department.

As per Order and on the name of the Governor of  
Maharashtra.

Sd/-

(P.K. Mahajan)

Joint Secretary (Forests),  
Revenue and Forest Department

## **ANNEXURE - 3**

### **Formation of the Maharashtra Bamboo Development Board**

#### **GOVERNMENT OF MAHARASHTRA**

##### **Revenue and Forest Department**

**Government Resolution No. BBS-2015/C.No. 139/F-9**

**Mantralaya, Mumbai-400 032**

**Dated : 06<sup>th</sup> August, 2016**

- Read :-** 1). Government Resolution No. EST-2013/C.No. 64/Part-2/F-9 of Revenue and Forest Department dtd. 4-12-2014
- 2). Letter Correspondence dated 8-4-2015, dated 3-3-2016, dated 16-4-2016, dated 26-4-2016 and dated 24-5-2016 of even File No. Desk-16/R-1/C.No. 101/2014-15 of the Principal Chief Conservator of Forests (Production and Management), Maharashtra State, Nagpur

#### **INTRODUCTION :-**

The bamboo is one of multi-use forest product and it is economically most important, it is called as the “**Green Gold**”. It has special place in the life of poor and in rural businesses. It is easily becoming available and affordable forest produce meeting



with the basic needs related to timber of human being. Therefore it is also called as the “**Timber of the Poor**” and there is exuberant capacity in it to create livelihood. The bamboos are found in hilly and skate areas in India. The bamboo is the specie growing fast, evergreen and of long life. There are total 1200 species of bamboo in the whole world and out of it, 128 species are found in the India. As regards bamboo resources, India is at second number in the world.

The geographical scope of bamboo is uneven and mainly, it is found in hot, humid, and semi cold areas. *Bambusa*, *Arundinacea*, *Dendrocalamus*, *Gigentochola*, *Indocalamus*, *Melocanna*, *Phyllostachys*, *Ochlandra*, *Schizostachyum*, *Sinobambusa*, *Oxytenanthera* genera are being found in the India. Out of it, mainly the species *Dendrocalamus*, *Bambusa*, *Oxytenanthera* of genera are being found in Maharashtra. The total forest area in Maharashtra is 61,939 Sq.km. and out of it, the bamboo area is of 8400 Sq.km. i.e. near about 13% of the forest area. The bamboos are mainly being found in Gadchiroli, Chandrapur, Amravati, Bhandara, Gondia Districts in the Maharashtra and out of it, there is more than 90 percent production of bamboos in Gadchiroli and Chandrapur districts.

The diversity of utility of bamboos is in extensive proportion. There is great capacity of strengthening the economy

by bamboos. The market of bamboos in this country is of about Rs. 26 thousand crores wherein there is inclusion of bamboo furniture, bamboo pulp, bamboo mats, board, cottage industries, ply board etc. Therefore, the bamboo is treated as the pillar of economy and social development. Moreover, of the use of bamboo is made as an alternate of furniture and timber, then there is unlimited capacity in bamboos to challenge global warming by speedily absorbing carbon. The India is the country at second number in the world in production of bamboos. Considering all these points, the Central Government has established National Bamboo Mission (N.B.M.) for proper development of bamboos and for achieving development of the whole country by fully utilizing the capacity of bamboos and making economical and social development of poor people.

There is need of concentrated efforts for making growth in the production of bamboos by treating it as the change agent, to grow productivity of bamboo forests, for its proper marketing. It is very necessary to give new direction to the Bamboo Policy considering all the points i.e. to achieve the main purpose of National Bamboo Mission, to have growth in production of bamboos, to solve the problems in marketing, to provide relaxations to the industrialists running bamboo based traditional and modern industries, to have remarkable growth in production and productivity of bamboos in the forests, to have plantation of standard bamboo

species in bamboo plantation in the forests, to have development of bamboo areas on government/private lands outside the forest areas, to have growth in production of value added items of bamboos, to provide training to desirous persons producing value added items, to make available the bamboo plants of good species and high standard to the people at reasonable rate, to have the bamboos available having treated essential for value added industries, to have proper marketing of value added items prepared at rural level. The government have thoughtfully taken steps in this regard and has declared new Bamboo Policy as per Government Resolution dated 4-12-2014. As a part to have exhaustive implementation of this Policy, the Bamboo Research and Training Centre is established at Chichpalli, District Chandrapur. With a view to have thorough development of bamboo areas and for paying special attention to it, the matter of establishing one independent autonomous institution was under government consideration. The following decision is being taken to establish the Maharashtra Bamboo Development Board for its fulfillment.

**Government Resolution :**

1. By this Government Resolution, the approval is being granted to establish one society in the form of the “Maharashtra Bamboo Development Board” and to make

registration under the Registration Act, 1860. The separate order will be issued in respect of Byelaws of the Governing Council and Executive Committee off the Board.

2. The Governing Council is being constituted under the Chairmanship of the Hon'ble Minister (Forests), Maharashtra State for taking Policy Decisions of this Board.

3. **Governing Council** :-

The Governing Council will be constituted under the Chairmanship of the Hon'ble Minister (Forests) for taking Policy Decision of the Board. The structure of the Governing Council, functions and powers as well as the functions and powers of the Chairman are given in the Memorandum of Association.

The formation of the Governing Council will be as under:-

1.	The Minister (Forests)	Chairman
2.	The Secretary (Forests)	Member
3.	The Secretary (Tribal Development or its representative)	Member
4.	Secretary (Industrial Department or its representative)	Member
5.	Secretary (Agriculture or its representative)	Member

6.	Principal Chief Conservator of Forests (Head of Forest Force), Nagpur	Member
7.	Principal Chief Conservator of Forests (Production and Management), Nagpur.	Member
8.	Managing Director, Forest Development Corporation, Nagpur	Member
9.	Principal Chief Conservator of Forests (Research, Education and Training), Pune	Member
10.	Principal Chief Conservator of Forests (Social Forestry), Pune	Member
11.	Additional Principal Chief Conservator of Forests (Budget, Planning and Development), Nagpur	Member
12.	Managing Director, M.S.S.I.D.C.	Member
13.	Managing Director, Maharashtra Khadi Village Industries Corporation	Member
14.	Managing Director, Maharashtra Handicrafts and Handloom Textiles Corporation,	Member
15.	Managing Director, Maharashtra Bamboo Development Board.	Member Secretary
16.	All nominated members as per the Byelaws.	Nominated Members
17.	Special Invitees to be taken with the approval of the Chairman	Special Invitee

#### 4. **Managing Committee:**

There will be the Managing Committee under the chairmanship of the Principal Chief Conservator of Forests (Head of

Forest Forces) for implementation of the operations of the Board under the Policy decided by the General Body and there will be the other members on the Committee as given in the Memorandum of Association so also, the Managing Director, Maharashtra Bamboo Development Board will be the Member-Secretary.

5. **The constitution of the Managing Committee will be as under :**

1.	Principal Chief Conservator of Forests (Head of Forest Force)	Acting Chairman
2.	Principal Chief Conservator of Forests (Production and Management)	Ex-Officio Member
3.	Principal Chief Conservator of Forests (Research, Education and Training)	Ex-Officio Member
4.	Principal Chief Conservator of Forests (Social Forestry), Pune	Ex-Officio Member
5.	Additional Principal Chief Conservator of Forests (Budget, Planning and Development)	Ex-Officio Member
6.	Managing Director, Maharashtra Bamboo Development Board	Member-Secretary

6. **General Functions of the Board :**

1. To make effective implementation of Bamboo Policy as Promotional Agency in bamboo areas in the State.

2. To submit the Proposal to the government for implementation of Bamboo related Policies, Schemes and Working Procedure coherently.
3. To strengthen inter-se interest in all the concerned for bamboo production and business growth.
4. To achieve original object of National Bamboo Mission,
5. To give encouragement for remarkable growth in the quality and production of bamboos produced in the State.
6. To suggest Schemes for encouragement to the industrialists for bamboo based traditional and modern industries.
7. To give encouragement for plantation of proper and standard bamboo species on forest areas/private lands for improving quality of bamboos in the State
8. To make available essentially treated bamboos for value added industries, to impart training to the desirous people for production of value added things, to make the growth in production of value added things of bamboos, to establish the Agency for proper marketing of value added things produced at rural level.
9. To make available the bamboo plants of good and useful species of high quality to the people at reasonable rate.

10. To arrange Seminars, Conferences, Industrialists Fairs, Exhibitions, Trainings so also, to participate in equivalent programs arranged by other Agencies.
11. To increase the employment with the coordination of the industrialists by giving trainings to the bamboo artisans in Bamboo Research and Training Centre at Chichpalli, District Chandrapur.
12. To participate in Training/Programs/Study Tours arranged on bamboos at International level.
13. To encourage bamboo business, to propose to the government by making study to establish Promotional Agency (Company) with the coordination with non-governmental institutions, private industrialists and government working effectively in bamboo fields.
14. To take necessary measures for development of bamboo based small scale industries in the adjoining/forest areas in the State like Gadchiroli Agarbatti Project etc.
15. To take possession, to purchase, to take on rent or to take on lease, to exchange, construct or obtain any movable-



immovable properties which is needed or convenient for achievement of object of the Board.

## **7. Jurisdiction of Maharashtra Bamboo Development Board**

This Board will make the planning and regulation of bamboo development on forests, wildlife, Forest Development Corporation, other government fields as well as private areas and in the reference of bamboos, will work in coordination with the concerned Departments of the government, Forest/Agriculture Departments in other States, Central Government and bamboo related International Institutions.

8. The approval is being granted for naming the post of Chief Conservator of Forests (Vigilance and Employees Welfare) in the office of the Principal Chief Conservator of Forests (Head of Forests Force), Nagpur as the Managing Director, Maharashtra Bamboo Development Board.

9. The Head Quarter of the Maharashtra Bamboo Development Board will remain at Nagpur.

10. The Maharashtra Bamboo Development Board will be registered as the Society under the Societies Act.

11. As mentioned in the accompanying Statement, the approval is being granted to divert the posts in the concerned cadres of the Forest Department and fill-up as essential for the Maharashtra Bamboo Development Board.

12. The approval is being granted to meet with the expenses on the salaries, allowances and incidental expenses as well as other office expenses of posts essential for the Board under the Heads as mentioned in the accompanying Statement till the new Accounts Head will be opened for the Maharashtra Bamboo Development Board,

13. On receipt of the Report of the Bamboo Committee established as per Government Resolution dated 24-7-2015 Final Report of the Committee, the Bamboo Development Board will make implementation of the recommendations approved by the government as per that Report.

14. Please take the precaution that the works to be done by the Maharashtra Bamboo Development Board should not be contrary to the provisions in the Forest Right Act as well as legal provisions in the Scheduled Areas.

15. This Government Resolution is being issued with the consent of Finance Department and Informal Reference Number 253/2015/Vyay-10 of Finance Department dated 09-08-2015.

16. This Government Resolution is made available on the website [www.maharashtra.gov.in](http://www.maharashtra.gov.in) of the Government of Maharashtra and its Code is 201608061530562819. This Order is being issued attested by digital signature.

As per Order and on the name of the Governor of Maharashtra.

Sd/-

Prakash Kashinath Mahajan  
(Prakash Mahajan)  
Joint Secretary (Forests),  
Revenue and Forest Department

## ANNEXURE - 4

### PROFILE OF NON OFFICIAL MEMBERS AND SPECIAL INVITEES OF THE BAMBOO COMMITTEE

Shri Sunil Joshi

Shri Sunil Joshi , based in Nagpur, is an architect from the renowned VNIT . He has been in the bamboo sector since 1990. He is founder of the ‘Institute of Village Enterprise Development for Handicraft Artisans (VEDHA) . This (SSI) unit, with CFC is located in Bhandara district. VEDHA is known for its high quality bamboo handicraft elegant design products and also for furniture. Sunil Joshi, being an architect, has also been promoting long span bamboo construction as well as bamboo interiors. His other area of interest is technical education aspects of people who are working in the bamboo sector. He is Chairman, Bamboo Society of India , Maharashtra chapter and active in various forums which promote bamboo.

Contact: 9823176472 , email: vedhaindia@mailcom

Shri Mohan Hirabai Hiralal

Shri Mohan Hirabai Hiralal is based in Chandrapur. He is founder Member of Vidharbha Bamboo Mission and Vrikshamitra. He has been an activist promoting various causes like community forest rights, PESA, and Gram Sabha as a unit of planning development and local government. He has been associated with Menda Lekha initiative, a village Gram Sabha in Gadchiroli district which manages its own resources and decides unanimously. He recently received the Jannalal Bajaj award given for outstanding and dedicated public service.

Contact:09422835234 , email: mohanh@ gmail.com

Shri Suneel Pande

Shri Suneel Pande, a mechanical engineer from IIT, joined the Indian Forest Service in 1990. He was assigned the Tripura Cadre. His talent was spotted and he was invited to join the newly formed National Mission for Bamboo Applications (NMBA) Government of India in 2002. He travelled throughout India promoting various type of bamboo units and introducing many techniques and processes for bamboo applications which boosted number of small units in bamboo sector. He is one of the most knowledgeable persons in the bamboo sector.

Presently he is in a senior management position with ITC, Hyderabad.

Contact:7674012868, email:suneel191@rediffmail.com

Shri Sanjeev Shashikant Karpe

Sanjeev Karpe is the founder director of Konkan Bamboo and Cane Development Centre (KONBAC) an organization working for sustainable development through use of bamboo as a resource for last more than 12 years. They have done excellent work in developing bamboo furniture and in bamboo construction. Sanjeev Karpe operates from Kudal, Sindhudurg District. KONBAC recently installed a large bamboo structure in Hyderabad (10750 sq feet). KONBAC received the 'Best Social Entrepreneur' award from Sankalp initiative of Intelcap and also Maharashtra Vrikshamitra Award.

Contact: 94223 69789, email: sanjeev.cibart@gmail.com

Shri Sunil Gunwant Deshpande

Shri Sunil Deshpande has been working in the bamboo sector since 1988. During 1988 to 1995 he worked in Jharkhand, Chitrookoot and in Yavatmal district promoting the bamboo cause. In 1995, he along with his wife started the Sampoorna Bamboo Kendra to promote the cause of bamboo in remote

and challenging Melghat area in Maharashtra. During the Kutch earthquake, his team did yeoman work by constructing bamboo *bhungas* to meet the immediate needs of those who became shelterless. Sunil Deshpande is specially concerned with giving a fair deal to bamboo artisans and in their economic and social welfare. Sampurna Bamboo Kendra has been working in the area of promoting bamboo housing, bamboo crafts, bamboo jewellery . Another unique item of Sampurna Bamboo Kendra is in production of bamboo rakhis which are very popular. He is also active in organising the craftsmen and skilled workers under Karigar Panchayats. He is also promoting institutions to upgrade skills of artisans. He and his wife have received a number of recognition awards for their work among the underprivileged.

Sampurna Bamboo Kendra,

Contact:- Ph:0974639457 email: sampurnabamboo@gmail.com

Shri Vaibhav Kaley:

Based in Nagpur, Shri Vaibhav Kaley had the good fortune of apprenticing with his father late Vinoo Kaley, whose missionary zeal and commitment inspired many towards bamboo line. Thus he 'experienced' bamboo from close distance in his formative years. After a graduation in interior design, he worked for a company, BCIL in Bengaluru. He has worked in a number of bamboo construction and design projects all over the country. He along with two colleagues founded the 'Wonder Grass Initiative Private Ltd. in 2008 with the vision to bring bamboo based building technology within easy reach of the common man. Wonder Grass has its unit at Peth, close to Nagpur and specialises in use of bamboo as a construction material. Wonder Grass has been featured in Outlook-Business as a promoting social enterprise.

Contact: 9011019001 email: [vaibhav@wondergrass.in](mailto:vaibhav@wondergrass.in)

Shri Rajesh Edke

Rajesh is a software engineer by profession. He came into this field due to love of the bamboo. He has done in house research and developed a new type of polyhouse which uses bamboo. He has built thousands of these bamboo polyhouses in Sikkim, Himachal Pradesh and other parts of India, which

has increased the income of small farmers. He has also taken the polyhouse technology to China. He has received patents for same from Government of India and China. He is based in Pune.

Contact: Ph: 98231 20381, 97350 36760 & [www.thousandpetals.in](http://www.thousandpetals.in)

### Special Invitees

Dr Ramanuja Rao

Dr Ramanuja Rao been associated with bamboo sector for over 25 years. Worked in INBAR Headquarters, China for 12 years . Widely travelled, he has up to date information on international trends and position on bamboo.

Contact: 098105 26343 email: [ivramaraj@gmail.com](mailto:ivramaraj@gmail.com)

Prof A G Rao

Professor AG Rao, who retired from Industrial Design Centre (IDC) , IIT , Mumbai has made a significant contribution to improving design of bamboo handicrafts and other utility products. He has developed a tool kit and many new techniques and processes for bamboo craftsmen and workers. His bamboo studio in IIT Mumbai is a must visit for those interested in bamboo sector and in crafts .

Contact: 098690 60245 (M) and [agrao@iitb.ac.in](mailto:agrao@iitb.ac.in)

Shri Saleem Sayeed:

Saleem is a Forest Officer attached to Wadali Nursery, in Amravati , Maharashtra. By his single minded dedication over decades and support from his senior officers he has developed a unique bamboo nursery consisting of various species collected from various parts of India. His work and methodology and nursery management practices will be of great use to the forest department in diversifying bamboo species across Maharashtra.

Contact: 9860220851



Tata Trust Officers:

Tata Trusts have shown great interest in developing the bamboo sector in Maharashtra and elsewhere in India. They supported a delegation of bamboo entrepreneurs and NGOs to visit China. They have been giving knowledge, skill and financial support to many units and organisations and their professionalism and guidance has been a big boost to this sector.

Subodh Kulkarni:

Subodh Kulkarni has been working in the bamboo sector for many years first in Gadchiroli and now in Western Maharashtra. He has been associated with issues relating to community rights, FRA , tribal issues and the like. At present he has taken up bamboo promotion cause in Western Maharashtra.

Contact: 094229 07330 email : [subodhkulkarni@gmail.com](mailto:subodhkulkarni@gmail.com)

Smt Lekshmi S.Sukumaran:

Lekshmi is an architect planner doing her PhD in IIT, Mumbai on the subject feasibility of bamboo as an alternative building material for housing in Kerala.

Contact: [lekshmisumitha@yahoo.com](mailto:lekshmisumitha@yahoo.com) ph: 98337 95540

Ms.Christina:

From Latin America has been working in bamboo housing for many years and gave an idea of the work on bamboo housing in the other side of the world to the Committee.

## Two success stories

### 1. Panchgoan- a Case study

Panchgoan is a small village in Ballarpur Taluka of Chandrapur district, about 40 kms south east of Chandrapur City. It consists of 60 households, with a population of about 250 people. They are predominantly from OCB, SC and ST communities.

There are 1006 hectares of forests around the village, which is rich in bamboo. The village received the benefit of Community Forests Rights in December 2009

The village community decided to manage its community forests in a disciplined and organized way. It is enforcing the following rules for the villagers regarding Forest ( bamboo) management :

- There is a daily cap of cutting only 50 bamboos and collecting up to 10 bamboo bundles
- The payment is restricted to Rs.4 for cutting one bamboo pole and Rs. 15 per bundle. In other words, no villager can earn more than Rs350 per day as wage labour by over exploiting the forests-  $Rs.4 \times 50 \text{ poles} = Rs.200 + Rs.150 \text{ for bamboo bundles ( } 10 \times Rs.15 \text{ per bundle)}$
- All labour payments are paid by the community – Gram Sabha to the villagers through bank. The accounts are operated jointly by man and wife , to promote gender equality.
- Cutting of bamboo is done on scientific principles- horse shoe method and no young bamboo below three years is allowed to be cut.
- Bamboo is sold at Rs 60 per pole to the villagers on need basis for personal use.
- Bamboo in the community forest is properly protected by continuous patrolling to prevent theft etc. For this they have engaged youths on full time jobs.

The community manages the income and expenditure of the community wealth. The bamboo is sold to the traders by auction process. So far there has been seven auctions and they have received Rs.82 lakhs over the years as net income. This is kept in the community kitty. They have paid Rs.2.75 lakhs as taxes as well. The bamboo is properly graded and stacked so as to get higher

price from the traders. Slowly, the villagers have learnt how to handle traders and get a good deal for their bamboo.

During a visit to the village in October 2015 the economic and social improvement in the village is very visible. They get assured wages and also there is an ever increasing community kitty. Some families have been able to send their children even to the college in Ballapur.

## **2. Economic development in Sindhudurg through propagation of *Oxytenanthera stocksii***

*Stocksii* is a unique specie . Unlike other species of bamboo it can be propagated only through vegetative propagation.

The National Mission for Bamboo Application(NMBA) seeing the merits of *stocksii*, supported the local social forestry nursery in Kudal, Sindhudurg with a working capital grant to increase the stock of *stocksii* for sale . Shri Jagtap, a dedicated Forest Officer , developed a good nursery of *stocksii* in a short time(year 2005). Seeing the benefits of growing *stocksii* the villagers purchased the sapling and planted it in their field bunds. Thus the production of *stocksii* has increased greatly in Sindhudurg district in last decade.

At present, reportedly about 2000 truckloads of *stocksii* are going out of Sindhudurg for sale, to other places fetching good supplementary income to farmers.

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## USES OF BAMBOO

1. Furniture Making	35. Vegetable garden props	69. Hats/caps
2. House construction	36. Bamboo Medicine "Vanshlochanm"	70. Blow guns
3. Eco tourism cottages	37. Bamboo rice	71. Smoking ancillaries
4. Earth quake proof houses	38. Bamboo tender shoots	72. Room dividers
5. Lamp shades	39. Bamboo pickles	73. Wind mills
6. Curtains	40. Bamboo beer	74. Winnower
7. Wall Hangings	41. Bamboo Agarbatti sticks	75. Bullet proof jackets
8. Wall claddings	42. Bamboo for Green energy in Gasifiers	
9. Flooring	43. Scaffolding	
10. Garden Benches	44. Shamiana/Pandal making	
11. Pagodas	45. Bamboo charcoal, Calorific value: 4000 K.Cal hence "A" grade coal	
12. Bridges	46. Ethanol, acetic acid and furfural making	
13. Desktop articles	47. Textile making	
14. Toys	48. Activated carbon	
15. Flutes	49. Bamboo sign boards	
16. Bullock carts	50. Vertical gardens	
17. Boat building	51. Water carrier pipes	
18. Truck body building	52. Laptop/Mobile covers	
19. Cycles	53. Cloth hangers	
20. Tooth pricks	54. Bamboo boxes	
21. Chop sticks	55. Road making(Base construction)	
22. Bows	56. Slope stabilization(Pinning of slopes)	
23. Arrows	57. Architecture material	
24. Catapults	58. Hanging bridges	
25. Fishing rods	59. Tree houses	
26. Fishing traps	60. Ladders	
27. Knife handles	61. Agriculture ploughs	
28. Kitchen knives	62. storage silos	
29. kitchen spoons	63. Paper making	
30. Dining plates	64. Pellet/briquette making	
31. Dining bowls	65. Green house construction	
32. Dining tables and chairs	66. Sliding shutter/Awning	
33. Baskets	67. Kites	
34. Farm fences	68. Kanvar/shoulder beam	