

## NATIONAL BAMBOO MISSION : A HOLISTIC SCHEME FOR DEVELOPMENT OF BAMBOO SECTOR IN TRIPURA

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### Introduction

Bamboo, popularly known as giant grass, with more than 1,575 species in 75 genera in the world, occurring in a great variety of soil and climatic conditions, plays an important role in providing livelihood, ecological and food security of the mankind. In India there are 140 bamboo species in 19 genera spread over about 96,000 km<sup>2</sup> of the total geographical area of India except the Kashmir valley. Estimated bamboo resources of the world are about 20 million ha. Estimated current world market of bamboo is US\$ 10 billion that is expected to increase to US\$ 20 billion by 2015. While China has only about 3% of the total forest area under bamboo growth, in India about 13% of the total forest area is covered with bamboo. In India bamboo resource consists of 130 MT with estimated annual harvest being 13.47 MT. Current market of bamboo/bamboo products in India is estimated to be Rs. 4,500 crores, expected to increase to Rs. 20,000 crores by 2015, with major contribution from wood substitute, processed bamboo shoots, industrial products (activated carbon and charcoal), structural applications and energy(thermal and electrical) segments. There are about 1,500 documented applications of bamboos, of which major ones include instruments, food items, handicrafts, large bamboo based industries, packaging, etc.

### Bamboo resources in Tripura

Tripura has 19 different species of bamboo (Table 1), of these, Muli bamboo (*Melocanna baccifera*) make up for more than 80% of all the species, followed by *Bambusa tulda* (Mritinga), *Schizostachyum dullooa* and others. Bamboo resources in the State are spread over an area of 3,440 km<sup>2</sup> of which pure bamboo brakes occur over 934 km<sup>2</sup> (approximately 15% of the State's forest area), bamboo mixed with other miscellaneous trees over 2,397 km<sup>2</sup> and bamboo clumps in small private holdings over 109 km<sup>2</sup>. About 11,400 ha of bamboo plantations have been raised by the Forest Department over the last 8 years since 1999. The average productivity of the resource for forests and farm areas is estimated to be 0.73 MT/ha/annum, which is higher than all India average of 0.51 MT/ha/annum but compares very poorly with productivity level of 3.79 MT/ha/annum in China.

### Economic Significance of Bamboo in Tripura

Bamboo plays an important role in the rural economy of the State by providing subsistence activities, employment generation and household income. It is the most suitable subsistence resource for about 28,000 families engaged in shifting

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**Table 1***Bamboo Species in Tripura*

Sl. No.	Scientific Name	Local Name
1.	<i>Bambusa tulda</i>	Mritinga
2.	<i>Dendrocalamus hamiltonii</i>	Pecha
3.	<i>Dendrocalamus longispachus</i>	Rupai
4.	<i>Gigantochola auriculata</i>	Kailyai, Kali
5.	<i>Melocalamus compactiflorus</i>	Sairil, Lata
6.	<i>Melocanna baccifera</i>	Muli, Nali
7.	<i>Schizostachyum dullooa</i>	Dolu
8.	<i>Bambusa balcooa</i>	Barak, Barua/Shil Barax etc.
9.	<i>Bambusa bambos</i>	Kanta, Bans
10.	<i>Bambusa comillensis</i>	Kanakkaich
11.	<i>Bambusa jaintiana</i>	Tetua
12.	<i>Bambusa multiplex</i>	Hedge bamboo
13.	<i>Bambusa nutans</i>	Mal, Makal, Makla
14.	<i>Bambusa polymorpha</i>	Phaura, Paora, Pachee
15.	<i>Bambusa salarkhanii</i>	Kantabarak
16.	<i>Bambusa vulgaris</i>	Bari, Jai
17.	<i>Bambusa vulgaris</i>	Golden bamboo, Sarna bans, Halud bans
18.	<i>Dendrocalamus strictus</i>	Lathi
19.	<i>Thryostachys oliveri</i>	Kanakkaich, Nusai, Butai

cultivation each year. The economic potential is far greater than current value

addition at only 1-2% of the total extracted bamboo. It is estimated that bamboo based management options generate around 6.1 million mandays of employment per annum and around 1.4 lakh artisans are engaged in value additions on bamboos producing an estimated annual craft of worth Rs. 35.34 crores. Of late, making of incense stick from bamboo has taken the scale of cottage industry in the State and an estimated 20,000 MT of incense sticks are exported every year from the State. Tribal communities in the State rely heavily on forest resources for their sustenance and 90% of the total population use biomass as an important source of energy. Bamboo sustains over 70% of the rural labour force in the State. Collection of timber and bamboo for house building and making household tools and implements remains an important source of income. The State has a rich heritage of traditional skills in weaving – cane and bamboo products, carpentry, wood carving, etc. to meet domestic requirements but these have not been harnessed to a great extent for commercial production.

The bamboo and its products can be used for various commercial and industrial products that would prove ideal for raising the economy of the local people without making any compromise to their other social-cultural-traditional needs and aspiration. Some of the important industrial usage of bamboo could be the following :

*Industry* : Wood substitutes (laminates, flooring, panels, particle boards, roofing, false ceiling, insulation material, chipboard, wafer board, bamboo ply, veneer); Building, Construction and Structural Application Industrial Products (shelter, community building, earthquake

resistant construction, scaffolding and ladders, road enforcement grids, embankment and slope protection, check dams and bridges, truck bodies, activated carbon); Specialized Bamboo Processing Machinery and Process Technology (dyes and modules, development of special purpose resin, etc.).

*Food and Agro-Processing* : Bamboo shoots, props for horticulture crops, sericulture, drip irrigation, cultivation and propagation. Product Application – small scale Enterprise: Bamboo furniture, kiosks, woven bamboo application, stick making, pencil, safety matches and other consumer applications.

### **The State Bamboo Policy of Tripura**

Considering tremendous scope for development of the bamboo sector, the State Government has formulated State Bamboo Policy in the year 2001 and constituted “State Bamboo Mission” for over all development of this important Sector. The main aims of the State Bamboo Policy are :

- To develop bamboo sector in the State through a market-led, community-based utilization, development and conservation of the resource in forest and farm areas;
- To provide a fillip to conservation;
- To develop resource, both in forest and farm areas through scientific means such as tissue culture, planned cultivation and improved management using community based initiatives amongst other practices;
- To improve utilization of bamboo by establishing small and large enterprises in the processes; and
- To develop effective marketing for the bamboo-based products.

*Goals and objectives* : The main Goals and Objectives of the Policy are :

- Development and implementation of a sustainable community based production model with concomitant benefits for forest conservation.
- Development and implementation of an economic development program using bamboo for spurring industrial development.
- Enhancing employment and income generating opportunities for tribal and rural poor using bamboo as the prime resource.
- Enhancing the productivity and production base up to a 10% annual increase of the sustainable yield from the year 2001 level.
- Enabling training, tools and other mechanical productivity enhancers, consolidation, distribution and marketing channels.
- Developing value additions in handicrafts through improved processing, product diversification, design development and enhanced shelf life, to produce quality products at par with international standards.
- Establishing bamboo industrial products as an economic and successful new industrial sub-sector. This includes developing Small Scale Industries (SSIs) and also medium-scale operations based on bamboo such as Bamboo Mat Boards (BMBs), Bamboo laminates, Bamboo ply, Bamboo flooring and Bamboo shoot processing, etc.
- Smaller industries for production of chopsticks, incense sticks and baskets would be promoted at the community level.
- Develop necessary market mechanisms with support towards

promotion and marketing of finished products.

- Popularize bamboo as a cost effective and earthquake resistant building material for housing in the State, which lies in one of the high seismic zones of the country.
- Arranging financial resources as may be necessary to achieve the above objectives.
- Setting up of monitoring facilities and systems for fine tuning the devised plans and ensuring their effectiveness.

*Strategies and approaches* : The following strategies and approaches have been advocated in the Policy for achieving the above mentioned goals and objectives :

- Community and private sector participation in bamboo development.
- Support to activities focused on conservation of bamboo resources.
- Plant propagation.
- Enhancement of the production base Management Information System (MIS), inventory and database development.
- Promotion of handicrafts.
- Industrial utilization and entrepreneurship development.
- Bamboo utilization in building material and low cost housing.
- Development of marketing and trading plan and systems.

#### **Development of Bamboo Sector in Tripura : Major Achievements**

The State Forest Department (SFD) is actively engaged in development of bamboo resources in the forest areas. Bamboo has been regenerated over about 11,400 ha degraded forest areas since 1999. Both State Plan and Centrally Sponsored Schemes (Additional Central Assistance;

NTFP; FWFP; Management of Prospective Gregarious Flowering of Muli Bamboo; North Eastern Council; Compensatory Afforestation; National Afforestation Programme, etc.) have been utilized in development of bamboo resources in the state. Muli bamboo (*M. baccifera*) accounts of 86% of total resource creation, followed by mix of muli and *B. vulgaris* (5.1%), mix of *B. vulgaris* and *B. balcooa* (2.8%), *B. vulgaris* (2.4%), *B. balcooa* (1.4%) and other species accounting for the rest. Tissue Culture Plantations on experimental basis with the technical assistance from the Regional Forest Research Institute, Jorhat, Assam have also been raised for *B. balcooa* (23.4 ha), *Dendrocalamus asper* (20 ha), *Bambusa nutans* and *Dendrocalamus hamiltonii* (1.5 ha each).

A special mention could be made of two Centrally Sponsored schemes, namely, 'National Afforestation Programme (NAP)' and 'Management of Prospective Gregarious Flowering of Bamboos in the North-Eastern States (MGFB)'. The NAP was launched in the State from the X Plan period in 12 Forest Development Agencies covering 236 Joint Forest Management Committees (JFMCs) and 22 Eco-development Committees (EDs) across the state. A mandatory provision in the NAP requiring creation and maintenance of bamboo resources has resulted in creation of 3,650 ha bamboo plantations between a period from 2002-07. The MGFB scheme provides for tackling the gregarious bamboo flowering (especially of muli bamboo) through creation/regeneration and maintenance of bamboo resources including commercial utilization of harvested bamboo. This scheme, which was started in 2005, has resulted in creation of bamboo plantations over about 1,835 ha area, besides creation of nurseries, quality

planting material, construction of link roads for harvesting of bamboo resources, construction of transit depots, soil & moisture conservation measures, value additions and marketing of bamboo and bamboo based products in all the nine territorial divisions and two wildlife sanctuaries. A total of Rs. 1,135 lakhs worth of funds have been received and utilized from 2005-07.

Both the schemes have been implemented in participatory mode with the active involvement of JFMCs and EDCs. Many Self-Help Groups (SHGs) have also been constituted either exclusively bamboo based or mixed with other activities to provide direct and immediate economic benefits and security to the local people. A total of 1510 families are exclusively covered under Bamboo based activities, such as, incense stick making (900 families), incense-stick rolling (100 families), planting and harvesting (500 families), and bamboo handicrafts (10 families). Apart from these, a total of 3,005 families are covered under JFMCs and EDCs that uses bamboo and other NTFPs for their sustenance. Besides, a total of 4275 families are dependent for their sustenance on bamboo based value additions outside the JFMCs/EDCs. Of these, maximum number of families are in incense-stick making (3,000 families), followed by incense-stick rolling (600 families), stick making and rolling together (290 families), umbrella rod making (200 families), dhari making (150 families), and bamboo handicraft (35 families).

The SFD has an ambitious target of raising bamboo plantations over 28,100 ha as part of two Externally Aided Projects, namely, Japan Bank of International Cooperation (21,600 ha) and Indo-German

Development Cooperation (6,500 ha) during the next Plan Period. This is over and above, the usual targets against the State Plan Schemes and other regular CSS (NAP, etc.). The SFD is also poised to start creation of Tissue Culture Plantations of key commercially important bamboo species by utilizing the existing tissue culture facilities in Forest Research Division and in collaboration with the Cane and Bamboo Technology Centre, Guwahati, Assam.

#### **Development of Bamboo Sector in Tripura : Future Road Map – Role of National Bamboo Mission**

In spite of above mentioned steps towards development of bamboo sector in the state, the real effect of benefits that should have had accrued to the local growers and farmers either individually or through JFMCs/EDCs has not met with the expectations. The approach so far has been staggered in form of resource creations (mostly by the Forest Department) and value additions and marketing (mostly through Industry & Commerce, Handicrafts, Handloom & Sericulture Departments). The growers are getting the price of only raw bamboo, while the chunk of the benefits through value additions to those bamboo resources is reaped by market agents and exporters. This is due to absence of a holistic scheme through which all different aspects of bamboo resource creation and utilization can be linked in one sequence and the benefit sharing thus could be ensured for the growers through sale of value-added bamboo products.

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(resource creation) to high-end value additions and marketing of bamboo and its products. It is a kind of one-stop shop providing funds for all ancillary activities that are needed to ensure that the newly created bamboo resources are put to end-use and its benefits are transferred to the local growers and artisans. The in-built funding and administrative mechanisms mandating use of existing FDAs (for plantations over forest areas) and constitution of Bamboo Development Agencies (for creation of resources over non-forest areas) ensure cent per cent participatory approach. The provision for raising Kisan and Mahila nursery ensures immediate monetary benefits to the beneficiaries as additional family income. The scheme provides scopes for creation of activity based SHGs that may feed each other leading to a composite common facility center mode of working where the output of one SHG may become the inputs for another SHG. This chain-like working would keep the competitive attitude among the beneficiaries leading to the timely completion of activities along with assured quality outputs.

The SFD has become a part of a new CSS, namely, National Bamboo Mission since 2006-07. The State Government has constituted State Bamboo Steering Committee for implementation of the scheme under the Chairmanship of the Chief Secretary, Tripura. The SFD is the Nodal Department for implementation of NBM in the State. Existing and prospective clusters in all the districts have been identified for the implementation of the NBM Scheme through FDAs and BDA (Bamboo Development Agencies). The SFD as Nodal Department is coordinating with the State Bamboo Mission, Agriculture & Horticulture Department, Handloom and

Handicraft Directorate, Rural Development, Autonomous District Council, Tribal Welfare Department, and other line departments to ensure effective utilization of the funds.

The SFD aims at promoting the JFMCs, EDCs and activity based SHGs for their perpetual economic welfare thus contributing substantially to the poverty alleviation and weaning of shifting cultivators by settling them on bamboo based economic activities. This is possible only when the capacity of the beneficiaries is build constantly in various aspects of management to carry it on independently even after termination of the Scheme. To this effect, the NBM provides scopes for training of farmers and field functionaries in various aspects of bamboo resource creation. Provisions for developing marketing linkages and establishment of bamboo wholesale and retail markets and outlets would facilitate beneficiaries in getting the competitive prices for their products for direct enhanced economic benefits. This would further encourage them in taking up the bamboo based ventures in larger scale. The scheme also provides for promoting other line departments through ancillary specific sub-schemes/projects within the ambit of the NBM directing towards development of specific aspects of bamboo sector (viz. demonstration technology; creation of TCPs; development of CFCs; development of marketing linkages; etc.). To this effect, the SFD has encouraged the Handloom, Handicraft and Sericulture Department and State Bamboo Mission to submit separate projects for development of handicrafts through existing growth centers in the state and high-end value additions by large scale manufacturing of bamboo dhari, bamboo mats, etc.,

respectively. The SFD is also providing funds to the State Bamboo Mission for undertaking monitoring and evaluation for productive feed-back that could be ploughed back into the operational mechanisms.

The SFD has submitted NBM Project Proposal for XIth Plan for Rs. 71.43 crores. The SFD has already been granted Rs. 122 lakhs during the year 2006-07 for undertaking various activities under NBM. The main activities proposed by the SFD for the development of this sector includes, among other things, raising of nurseries in both public and private sectors involving farmers and women; raising of new and maintenance of older bamboo plantations both in forest and non-forest areas under participatory approach; training to the farmers and the field functionaries in the art and nuances of the creation, harvesting, utilization, and marketing of bamboo and bamboo based value added products. The SFD proposes to set up 20 demonstration technology centers using NBM funds. The SFD has distributed funds to two FDAs and one BDA besides providing funds to the State Bamboo Mission for carrying out select bamboo based activities including setting of market linkages and monitoring and evaluation.

The Annual Plan of Operation for the year 2007-08 has already been sent to NBM following detailed deliberations at the National Level Steering Committee meeting in August 2007 for Rs. 1543 lakhs. The SFD intends to extend NBM related activities in all the 12 FDAs and in all the four BDAs (one in each district) through participatory approach. The SFD proposes to raise a total of 563 centralized, *Kisan*, and *mahila* nurseries both in public and private sectors. Of the total 563 nurseries,

328 are to be raised through FDAs and remaining 235 nurseries through BDAs. Area expansion under bamboo plantations has been targeted at 2,000 ha in forest area and 2,444 ha in non-forest area. Improvement of the existing stock of bamboo plantations will be taken up over 1,200 ha in forest area and 1,290 ha in non-forest areas. Both SFD and Agriculture department have proposed training of farmers and field functionaries, while the Department of Handicraft, Handloom & Sericulture (DHHS) has proposed for training to the entrepreneurs. The APO also includes a special project from DHHS for development of Common Facility Centers for bamboo based value additions. The APO proposes to set up about 400 demonstration technology units during the current planning period. As part of awareness creation and capacity building, it is also contemplated to provide technical and funding assistance to Tripura University for an on-going post-graduate regular course on Bamboo Conservation and Resource Utilization in the Botany Department.

### **Strengthening the Participatory Planning and Execution**

As stated in earlier paragraphs, the SFD has resolved to increase the number of JFMCs to ensure at least one JFMC in each gaon sabha/village panchayat. Necessary steps have already been taken up in this direction to increase the existing number of JFMCs/EDCs at 472 to a total of 900, with corresponding increase in the project area, number of participatory families and plantation area. The JFMCs/EDCs provide essential prerequisites for development of bamboo sector, namely, availability of skilled manpower, availability of resources at competitive



prices, and presence of well established institutions mandating active participation and control of local people and local elected public representatives. The trained and skilled farmers and JFMC/EDC members will be able to generate bamboo resources, which can be used as inputs to run both cottage-based and high-end industrial-based value addition units. The Resource Collection centers will be set up catering to a given bamboo cluster in the form of specialized SHGs. The Primary and Secondary Processing Units will be set up depending upon the availability of the resources and their links with the Common Facility Centers to provide semi-processed/partially value-added raw materials for industrial production. The finished products can be marketed through wholesale and retail markets and outlets within and outside the state.

This Model will ensure benefits to the growers/farmers/JFMC & EDC members at different stages right from creation of nurseries to the marketing of the semi-processed/industrial products at the very grass root level that will also act as an

incentive for enhanced qualitative outputs. The capacity building and skill development among the farmers and local people in varied aspects of bamboo resource creation and utilization will ensure sustainability of their economic benefits in the long run even after the termination of the Scheme. The provisions of Technical Support as it exists in the Scheme through identified institutions (Cane and Bamboo Technology Center, Guwahati for Northeastern states including Tripura) would help in maintaining the quality both in inputs and outputs through periodic technical guidance and certification processes.

With the technical and financial supports from NBM, the bamboo stands poised to usher in an ecological and economic prosperity revolution as the most convenient, user friendly and most easily available economic resource for poverty alleviation of the rural masses in the State. It would further lead to building up of secondary sector, generating trade and commerce within the country and beyond the borders adding ultimately to the national prosperity.

### SUMMARY

Tripura State has several bamboo species of which muli bamboo (*Melocanna baccifera*) constitutes more than 80% of all its species. Bamboo plays an important role in its rural economy by providing sustenance employment and household income. Bamboo based management can generate 6.1 million mandays employment per annum producing annual value addition of Rs. 55.34 crores. More than 70% work force comes from rural areas. Bamboo policy and its objectives along with strategies to achieve these objectives have been stated and major achievement of the bamboo sector spelt out. For future development a National Bamboo Mission has been formed and a road map for its working drawn out. The schemes will be planned and executed on participatory basis, taking cooperation of other departments, organization, groups etc. It is expected that the Mission will usher ecological and economic prosperity in the State as also generate trade and commerce in bamboos, leading to national prosperity as well.

**Key words :** Tripura State, Bamboo Policy, Development of Bamboo Sector, National Bamboo Mission.

**राष्ट्रीय बांस मिशन : त्रिपुरा में बांस सेक्टर के विकास की समेकित योजना**

अतुल कुमार गुप्त

**संाराश**

त्रिपुरा राज्य में बांसों की अनेक जातियां मिलती हैं जिनमें मूली बांस (*मेलोकैन्ना बैक्कीफेरा*) सभी बांस जातियों का 20% से अधिक भाग है। बांसों की यहां की ग्रामीण अर्थव्यवस्था में महत्वपूर्ण भूमिका है क्योंकि इनसे उन्हें आजीविका, रोजगार और घरेलू आय प्राप्त होती है। बांसों के प्रबन्ध से 61 लाख मानवदिनों का काम प्रतिवर्ष उत्पन्न होता है और रु० 55.34 करोड़ का मूल्य अभिवर्धन भी। 70% से ज्यादा श्रमिक लोग इसमें ग्रामीण क्षेत्रों से आते हैं। राज्य की बांस नीति, और इसके उद्देश्यों को, इन उद्देश्यों को प्राप्त करने के लिए अपनाई समरनीतियों सहित बताया गया है। जो उपलब्धियां बांस सेक्टर में मिली हैं उन्हें भी बताया गया है। भविष्य में विकास के लिए राष्ट्रीय बांस मिशन स्थापित किया गया है और उसके कार्य की रूपरेखा तैयार की गई है। इसकी योजनाएं सहभागिता आधार पर बनाई और पूरी की जाएंगी और अन्य विभागों, संगठनों, वर्गों आदि का सहयोग भी लिया जाएगा। आशा है कि यह मिशन राज्य में पारिस्थिकीय और आर्थिक समृद्धि लाएगा, उससे बांसों का वाणिज्य व्यवसाय भी बढ़ेगा जिससे राष्ट्र की समृद्धि भी आएगी।

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