

# Tripura Bamboo Mission OUTLOOK 2025

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## Submitted to

Mission Director  
Tripura Bamboo Mission (TBM)  
Agartala, Tripura



## Submitted by

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## **Preface**

Bamboo is life line of Tripura. Apart from its varied house hold uses, it has a lot of commercial and industrial values. Presently it contributes to the income of poor and also provides substantial revenue to state government. According to a macro level assessment, the bamboo sector is poised to make huge contribution to the State's economy. If the pace of development of this sector continues, even with present tempo this could achieve a target of Rs.1000 cr annually to the state exchequer in next 10 years or so.

The productivity of bamboo is very high owing to most hospitable soil and climatic conditions. The state has 19 natural and cultivated bamboo species. It has been first state to formulate State Bamboo Policy in as early as 2002. Looking to all these advantages State has had its planners thought ahead of time to formulate a strategic plan for bamboo sector development for speedy socio economic development of the state in 2006. This gave birth to a mission mode program acronym **Tripura Bamboo Mission - TBM**.

The activity & programs of TBM are being implemented by a team of IL&FS and foresters of Tripura Government. In the past decade or so it has done well in all sectors / applications of Bamboo. In order to maintain transparency in its working, the TBM has been subjected to mid – term evaluation and end-term evaluation in the years 2009 and 2011 and now in 2015-16 (Dec-Jan).

The successive evaluations had made recommendations which have been largely implemented by TBM. In the present evaluation the necessity for its continuance in the structure, function and focus has been highlighted. As a way forward there are targets / goals proposed which could be achieved by TBM for the sustainable development of bamboo for the economic development of the State.

## **Acknowledgement**

The current evaluation team thank Tripura Bamboo Mission for providing this opportunity to understand the work being done and share their feedback. In particular Mr. V. George Jenner, IFS whose visionary approach is responsible for steering the activities of TBM during right from its initial phase, not only for value addition but also for improving the resource base by involving local communities, deserves special compliments for his qualities of leadership, vision and dedication, to put TBM on strong footing. TBM is now in maturing phase & to be a most vibrant mission mode program in the North-East. We appreciate the ongoing efforts of TBM under the leadership of Mr. S Prabhu, IFS, Mission Director – TBM and the professional team of IL & FS headed by Mr. Kedar Krushna Panda, in further developing this sector.

We would like to express our gratitude for all the help and courtesy extended to us during our evaluation work and in providing useful data. We also thank various senior officials of Government of Tripura, from Industries Department and Forest department, other staff of TBM, who have been very helpful in making our evaluation possible.

We assure our continued association & wish Tripura Bamboo Mission a grand success.

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Former PCCF, M P Forest Dept.,  
Govt. of Madhya Pradesh &  
Former Director, IIFM Bhopal

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Director & Head, Gujarat Knowledge  
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## **1. Executive Summary**

The Tripura Bamboo Mission has been implementing various activities outlined in the strategic document prepared in year 2006, which is now about a decade. The Mission has been largely implemented by a professional organization IL&FS with great efficiency despite many challenges, mostly on account of financial constraints and to some extent lack of manpower. The Mission has focused on all activities provisioned in the Mission Document, covering various aspects like - resource development, cluster development & technology induction, institution development, capacity building, mobilization of financial resources, resource augmentation through private plantation, market development etc.

The mission has successfully demonstrated the model of using MNREGA resources for the benefit of creating bamboo resource in shortest possible time. About 1000 hectares of bamboo plantations have been raised on beneficiary's fields and it seems, this tempo continues to build upon by implementation team.

Despite many eyebrow raised about the involvement of a private agency like IL&FS, it appears that government has fully recognized the efforts of present composition of Team TBM, which is a right mix of foresters and professionals performing without any scope of conflicts in implementation strategy. The implementing agency might also have felt fatigued, by doing this arduous work of mobilizing financial resources from multiple agencies and mobilizing poorest among poor communities and putting them together against the formalities required to avail the provisions of MNREGA budget for enabling bamboo plantations and as well as processing of bamboo in SHG mode (basketry, toys, mats, artisan items etc.,).

The evaluation team has visited plantation sites, discussed with different stake holders including farmers and SHG members mostly women who have demonstrated commitment for converting bamboo resources in to a sustainable source of livelihood for them. It is observed that, the work continues without any slackness.

In fact the team of IL&FS has done much above their capacity for single reason that they have the commitment, could visualise the benefit to the state, as well IL & FS has the support of forest department, rural and industry department in particular and government in general.

This model now appears fully institutionalized and we do not foresee any reason for altering the present strategy, methodology and work culture. TBM has demonstrated that

the current mix of foresters and professionals of IL&FS could continue to meet the social, ecological and economic dimension of sustainable development in the state.

## **2. Background information of TBM**

Tripura Bamboo Mission was constituted in the year 2006 under the department of Industries & Commerce; Govt. of Tripura to coordinate the bamboo based activity in the state of Tripura. This mission came to existence based on the project documents, strategy report and subsector reports created considering the various factors prevailed during the year 2005-06.

Based on the available vast bamboo resource in the state, the Govt. of Tripura envisioned the need of bringing out the commercial and economic benefit to the community particularly the rural and tribal, who depend on bamboo heavily for their livelihood. The TBM has a "Farm to Market" approach and aims to optimize the end-to-end value chain spanning from plantation and resource generation to marketing of value added finished products. The initiative initially focused on leveraging the market link through various entrepreneurs in the five major sub sector of bamboo like

- Incense stick
- Mat (Dhari)
- Utility handicrafts,
- Bamboo furniture
- Industrial products

duly keeping the focus on development of bamboo resources to match the future requirements.

It also counted the institutions available in the state particularly for marketing the bamboo handicraft products and imparting the skill training to the target group. The state also constituted two committees / monitoring mechanism, in the names of - Mission Steering Committee and the Project Implementation Agency to accelerate the growth of the bamboo sector in a coordinated manner over the next three years. The mission targeted to double the sector turnover and double the livelihood involvement over the three years' time.

The State Government has facilitated the creation of a Project Implementation Agency (PIA) to manage sector growth that will foster an entrepreneur based cluster development approach. Fostering entrepreneurial skills and building a strong institutional system will instil confidence in producers and buyers alike and would be an important prerequisite to project success. Creation of Institutions and infrastructure development

are two very important aspects under this mission. The Mission is being implemented by IL& FS Cluster Initiative Ltd, Delhi since year 2007.

The Mission could meet its sector turnover target from Rs 27 crore to Rs 76 crore and doubling the livelihood involvement during the 2<sup>nd</sup> term i.e from April 2007 to March 2010. The Mission commissioned the 1<sup>st</sup> evaluation of the project in the year 2009 and based on the finding of the evaluation team, the project extended for another two years i.e from April 2010 to March 2012.

The Mission commissioned the 2<sup>nd</sup> evaluation of the project in the year 2011 and based on the finding and recommendations of the study the tenure of the project extended to another five years i.e April 2012 to March 2017. The Mission target enhanced to Rs 200 crore from Rs 107 crores and the livelihood involvement target to double during this 3<sup>rd</sup> term.

The midterm evaluations undertaken in 2009 and 2011 by APTDC had thoroughly reviewed the performance of the project and had made concrete recommendations to improve the impact of the project. These have been incorporated into the project implementation.

However now with changing international trade regime, opening of Indian economy, depletion of bamboo resource and development of technology and market in the national and international level, TBM needs to review its **strategy, focus, process, progress and future scope** so that it can achieve its objective of providing livelihood to the community and developing the bamboo sector in a sustainable manner.

Tripura Bamboo Mission supported the state Govt. in establishing one unique industrial park, to be the first of its kind in India, focusing on industrial application of bamboo and the anchor investor has invested around Rs 35 crore to produce bamboo composite wood and bamboo flooring tiles that is unique to India. This industry along with many small industrial units required huge quantity of bamboo for producing bamboo products from Tripura for Indian & international markets. The state has now more than 15 bamboo based industrial units producing bamboo round stick, chop sticks, bamboo wood, flooring tiles, agarbatthi masala pulverizing unit etc.

However over the time, the availability of basic raw material, bamboo, is throwing a major challenge for the bamboo industries of Tripura.

Tripura is one of the state declared by Ministry of Textiles (MoT), under its other natural fibre policy, as One State One Fibre (OSOF) for pineapple fibre. Excluding pineapple the

state also possesses many other natural fibres that are has a huge potential for creating value to the community. During the last steering committee meeting, it was decided to explore possibility of utilizing this opportunity.

The state is now getting connected through broad gauge rail line and vehicle transit through Bangladesh is opening up for transporting of goods and raw material. Tripura being the gate way for North East Region, the opportunity envisaged in future shall be well planned so that the state can leverage the benefit in its favour. With this background, the "Evaluation -2015" has done the assessment, so that the mission could meet its higher objectives &relevance in fulfilling the expectation of the stake holders.

### **3. Earlier Evaluations of TBM**

TBM has adopted timely evaluation of their activity by external experts.

- Year 2006 - 07: Implementation started with IL&FS as PIA
- Year 2007 – 10: TBM Project Phase 1 – Mid Term Evaluation took place in 2009
- Year 2010 – 12: TBM Project Phase I1 – End Term Evaluation took place in 2011
- Year 2012 – 17: TBM Project Phase III – Strategy outlook 2025 taking place in 2015

#### **3.1. Key Findings of Previous Evaluation**

##### **Year 2007 – 10: TBM Project Phase 1 – Mid Term Evaluation, in 2009**

Over a short period of over 15 months, the total outturn from this sector has reached Rs. 56.56 Crores which was double of the base line turnover. During this period the emphasis was on strengthening of the institutional structure, consolidating the traditional activities (of stick making and bamboo handicrafts), promoting private sector participation in capacity building (partnerships have been arranged) and market linkages etc.,. Efforts initiated in establishment of a Bamboo park near Agartala have been worth mentioning. Critical issues that need attention are in the areas of supply chain management and promotion & mentoring local entrepreneurs.

##### **Year 2010 – 12: TBM Project Phase II – End Term Evaluation, in 2011**

The end term evaluation exercised focus has been on evaluating the performance of the TBM in terms of the performance achieved as against the targets set and the action taken and progress achieved of the key recommendations of the Midterm evaluation.

The achievements were broadly discussed in the following categories:

- Growth of the Bamboo Sector in the State
- Achievement of Turnover Targets
- Total Financial Resources Mobilized by TBM
- Coverage and Outreach of TBM
- Capacity Building and Training Programs undertaken

The bamboo sector in Tripura has experienced vast growth in the past five years. From the base level size of the sector estimated at Rs 28 crores, the sector has registered an impressive absolute growth rate of 240% and a CAGR of 35.8% with the total size of the sector as on 31<sup>st</sup> March 2011 estimated at Rs 93.05 crores.

The mats sector and industrial applications were not found making any appreciable impact. However with reference to Bamboo Park, the work had started and the park is scheduled to commence its operations over next 2-3 years.

The handicrafts sector, which is another traditional strength of Tripura, the progress also fell short of expectations. It was not comparable to the growth recorded in the incense sticks sub-sector. Though substantial effort have gone into design & institutional development, capacity building and market support, the market share in this sub-sector remained to be less than 20% compared to 50% market share, at the time of launch of TBM – which could have been better if the quality & quantity of the crafts have been enhanced while acknowledging the inherited skills of the artisans of the state.

During this 5 year phase, in respect of mobilizing financial resources the TBM could line-up Rs. 46.24 crore as against Rs.6.78 crore made available at the time of its launch. It was also noted that TBM implemented its multiple activities covering training to production to community institutions to market access enablement, in 33 clusters in all the 4 districts of Tripura.

### 3.2. Action taken on Recommendations of Previous Evaluations

The salient points of the previous evaluation exercises and action taken thereon by TBM are summarized in the following paragraphs:

Sl. No	Recommendation	Compliance
1.	Structure of the TBM will have to be strengthened so that it emerges as a robust autonomous organization driving inclusive growth in the bamboo sector in the state. TBM may be graduated to form the Tripura Bamboo Board (TBB) given the commercial importance of bamboo in the state.	On the recommendation of Evaluation Report 2011, it was decided by the Coordinated Steering Committee on its sixth meeting (held on 29 <sup>th</sup> February, 2012) to strengthen the institutional structure of Tripura Bamboo Mission by registering it under Societies Act.
2.	Strengthening the institutional structure of TBM  It is proposed to establish TBM as Tripura Bamboo Board (TBB),	Tripura Bamboo Mission has been registered as a society under the Societies Registration Act, 1860 in 2012. This was done to strengthen the institutional structure of TBM for a long term sustainability of the project activities.
3	Increased Livelihood Focus	This is already being acted upon.
4	Priority on Resource Generation	TBM has successfully mobilized communities to raise bamboo plantations using MNREGA

		<p>funds. This activity is continuing to include small and marginal farmers. The TBM has succeeded in reversing the trend of converting forests land in to Rubber plantations. Now bamboo is gradually becoming popular economic option.</p>
5	Assessing Silvicultural availability	<p>This is a desirable activity but it could best be done by Tripura Forest Department rather than TBM,</p>
6	<p>a) Ensuring scientific management of Bamboo:  b) Afforestation measures:  c) Extension forestry &amp; bamboo plantations</p>	<p>More than 90% bamboo forests are with forest department. They have implemented JICA assisted forestry project for about a decade. They have also raised thousands of hectare of bamboo plantations. The natural bamboo forests are supposed to be managed as per the prescription of Working Plans revised from time to time. The issue of sustainable management and afforestation activity in forest areas have been done by Tripura Forest Department. TBM has virtually very little to offer to TFD in this regard as they are much bigger in respect of budgetary</p>

		allocation, human resources and technical capacity. In case forest department allot certain bamboo bearing areas to TBM, it may implement the prescriptions of Sustainable Forest Management and afforestation.
7	Issue regarding human resource requirement:	TBM has been trying to efficiently implement the work plan with a mean and lean organization. It has a good mix of foresters and professional executives. As and when the access to higher budgetary allocation available it could add on a few more professionals and foresters.
8	<p><b>Issue of convergence</b></p> <p>Convergence with other Livelihoods, Tribal Welfare and Forestry Programs</p> <p>Convergence with the Bamboo Park</p>	<p>It has been implementing private bamboo plantations through small and marginal farmers accessing resources of a number of departments and agencies. This effort is to continue.</p> <p>TBM has played a promotional role in bringing industry for production of bamboo wood and other high value products. (e.g. incense sticks). This will</p>

		continue.
9	Awareness & Capacity building	This is on-going activity. A number of training programs have been organized in the past. This will continue.
10	Monitoring arrangement	The evaluation at regular interval is towards monitoring approach.

Source: Information made available by TBM

The TBM has been actively working towards maximizing the livelihood of local people through various activities of bamboo sector development be it through resource augmentation, sustainable harvesting, processing and production and marketing of innumerable items of handicrafts and industrial products. The Tripura Bamboo Park has so far seen only one industry on production of bamboo wood. There are a number of other proposals under the consideration of government of Tripura. The TBM has been constructively playing the role of promoting agency.

#### **4. TBM Evaluation 2015 : Scope of the Study**

##### **4.1. Purpose of the Evaluation 2015**

The purpose of the Evaluation is to assess the **strategy, focus, process, progress and future scope of TBM** and study the impact of the project on the overall development of the bamboo sector in the state. Based on the findings of the evaluation, to suggest the way forward and the long term strategy for the bamboo sector development in the state. Thereby, the Tripura bamboo mission will equip itself to meet the challenges of the bamboo sector in the state and lead an example for the rest of the country.

##### **4.2. Key Questions to be addressed**

In pursuit of the overall objectives, the Evaluation-2015 will address the following:

#### **4.2.1.Revisiting the TBM Strategy**

- Is the strategy developed in 2006 still relevant in present context? Are the focus sub-sectors, process identified in the beginning still relevant in the changing market scenario?
- Do the subsectors identified and program focus during the last eight years still carry same priority?
- What should be the priority areas and aspects for the next 10 years to meet the overall Vision, mission and objectives of TBM?

#### **4.2.2.Assessing the Progress Achieved**

- To what extent has the project achieved its overall objectives and what are the major achievements of the project
- What are the major areas of shortfall and reasons leading to these shortfalls & possible remedies
- Constraints under which the program has been implemented-financial, structural, institutional and related policies.
- Describe the process of institution building and the coordination / convergence between the various stakeholders involved (Community, Private Sector, Government Departments) for the overall implementation of the project
- Document major lessons that have emerged over the period

#### **4.2.3.Recommendations and Future Strategy**

- Describe the strategy to improve the sustainability of the project outcomes and build the potential for replicating the approach with focus on changing international trade regime, market dynamics, sustainable raw material availability and available technology.
- Can the mission focus on other natural fibre available in the State to meet the challenges related to diversification of the product portfolio and the sustainability of the raw material requirement?
- Suggest the way forward and a long term strategy for the development of the bamboo sector in the state.

### 4.3. Expected Deliverables

- Draft Evaluation Report
- Presentation of draft evaluation report to the Mission Steering Committee and the Governing body of TBM Society
- Final Evaluation Report (Based on comments and feedback from the Government of Tripura)
- Final presentation on the key findings and the suggestions for the way forward to the mission steering committee of TBM.

## 5. Team Composition

**For TBM Evaluation 2025**, GKAFC has constituted the following experts as the evaluation team to review the working of TBM and made recommendations as per the ToR.

- **Dr. Ram Prasad, IFS, Former Principal Chief Conservator of Forests, Govt. of Madhya Pradesh and Former Director, Indian Institute of Forest Management, Bhopal.** He had a long experience in forestry research, training, education and consultation. Good exposure to different aspects of management of bamboo. Had worked as Chief Technical Advisor to JICA assisted Forestry Project in Tripura during year 2008 - 12. He had good exposure to forestry management problem of Central India, Tripura and North-East. He has had experience evaluating forestry projects implemented by FAO, UNDP, World Bank, JICA etc.
- **Mr. K. Srinivasa Murthy, Director - Confederation of Indian Industry (CII) and Head - Gujarat Knowledge Application & Facilitation Centre (GKAFC), Ahmedabad,** was associated with bamboo since year 2002. Mr Murthy, has been rendering services towards enterprise development, technical problem solving, technology dissemination & commercialization etc., for over 20 years. Under CII, as one of the focus activity, Mr Murthy has executed a range of assignments in Bamboo, covering plantations, bamboo to activated carbon, market development for bamboo products manufactured by Industry &

Communities and closely associated with NMBA, Andhra Pradesh Forest Development etc., and had been member of mid-term and end-term evaluation of TBM in years 2009 & 2011 respectively.

## 6. Methodology & Time Frame

### 6.1. Methodology Adopted

Review of all relevant project documents	Stakeholders Consultation	Extensive Discussions: Project Beneficiaries
<input type="checkbox"/> TBM main report, strategy report, sub sector reports, progress reports & evaluation reports over the last 8 to 9 years	<input type="checkbox"/> Consultation with the TBM project implementation team including the Mission Coordinator <input type="checkbox"/> Meetings with senior Government Officials especially members of the Mission Steering <input type="checkbox"/> Committee and the board members of the TBM society <input type="checkbox"/> Consultations and discussions with all community, entrepreneurs, civil societies and other Stakeholders & field Visit to different clusters, production units and plantation sites etc.,	<input type="checkbox"/> Consultations / meetings / interviews with the project beneficiaries.

### 6.2. Proposed Time Frame

The review assignment is to be undertaken in a time bound manner, **with a total time period of 6-8 professional weeks from the date of awarding of the work-order**, that will include a five - six day field visit to Tripura. The mission would entail visits to project sites and also include meetings with beneficiaries, project officials, Government of Tripura officials and other stakeholders involved.

The consultant should feel free to contact the Project Implementing Agency in advance to elaborate specific programme / meetings as deemed appropriate. The Project Implementing Agency will support in organizing these arrangements and extend all support to make the visit of the mission team purposeful, particularly in facilitating availability of documents for needs raised by the consultants.

## 7. Addressing the Key Questions asked in the Scope of the Study

### 7.1. Key Observations

- 1) The Tripura Bamboo Mission (**TBM**) launched in 2006 was a very timely and bold initiative as it envisioned developing sustainable bamboo resources for the wellbeing of its people. The people connected with the management of bamboo have known about the richness and quality of bamboo in the entire NE states followed by Central Indian States. In case of Tripura, the climate and soil are so favourable that it can produce maximum bio-mass in a period which is unthinkable in any other patch of land in the country. In such a unique landscape with so varied and rich flora, including 19 species of bamboo, the decision to launch Tripura Bamboo Mission could be termed as a decision taken "**Ahead of Time**".
- 2) Gregarious flowering of *Mellocana baccifera* (Muli) had fully set in which was definitely going to affect short supply of such widely used bamboo in the state for some time till the species in flowering got fully rehabilitated. Most of the rural population used this bamboo for household needs and for converting them in to small and medium sized cottage items giving employment to workers and artisans.

In addition to Muli undergoing widespread gregarious flowering a number of other prominent species also flowered. The information on gregarious flowering of other species was as follows:

- ✓ *Melocanna baccifera* (Muli) all over Tripura since 2002 to 2014
  - ✓ *Bambusa tulda* (Mirtinga) : In West and North Tripura in 2010, 2011
  - ✓ *Schizostachyum dulloa* (Dollu): in 2001,2002, 2010 Dhalai and North Tripura
  - ✓ *Dendrocalamus longispathus* (Rupai), 2010-14 Dhalai, North Tripura
  - ✓ *Gigantochloa andamanica* (Kaliya)- 2006-08: majority area in South Tripura
- a. Implementation of Forest Right Act, 2006 had seen large scale diversion of forest land, most of which was bamboo bearing (about 1750 sq. km forest area / 175,000 ha) was transferred for other uses. Many bamboo bearing areas in both south and north districts were being cleared by FRA allottees who preferred Rubber rather than bamboo.

- b. Due to gregarious flowering of bamboo in central Indian states the pressure on supply of bamboo for incense sticks had additionally come upon on Tripura and other North-Eastern States.
  - c. Formulation of JICA Project promised huge investment in afforestation of bamboo for employment generation and income to the rural poor. However, protection of the plantations proved to be major challenge. It was challenge to persuade FRA allottees to plant bamboo rather than Rubber. For some years this did not appear to be succeeding, but now with constant efforts of TBM and forest department, supported by strong political will, the trend of bamboo plantation has started gaining acceptance & momentum among the people. This was in tune with the objectives of setting up of TBM a decade back. This will continue to require promotional support from TBM as it promises livelihood security of large number of small and marginal land holders getting remunerative returns beginning in a short period of 2-3 years.
- 3) The generosity of Nature is well exhibited by about 19 species of natural and cultivated varieties of bamboos. Nature has been equally magnanimous in creating most hospitable edaphic and climatic conditions that productivity of the eco-system is comparable to any other similar landscape in the country. In respect of bamboo people and particularly the foresters are often quoting China ahead of all other bamboo growing Regions of the world. However, their visit to some farmer's field will comprehensively convince them that recruitment of new culms ranging from 30-50 numbers on an average, with an estimated overall height of 20-25m and each new Culm weighing about 25 kg will annually add to about a quarter of a ton per clump. Presuming a stocking of only 50-75 clumps per hectare will have an assured yield of 50 ton/ha/year.

TBM sponsored high density bamboo plantations have also been assessed to yield about 20 t/ha/year at the end of 3 years. This was based on the observation, while visiting some of the kanakkaich bamboo plantations raised by TBM in Hezamara. There it was observed that the clumps have grown to a height of 7-8 m within one and half year of plantation. Each clump contains 8-12 bamboo poles with average weight of 3-4 kg. Considering the average stand of 3500 plants per ha and 5 harvestable poles with average weight of 3 kg, the average productivity comes to

52 MT per ha. These two examples, one based on farmland and another on TBM's high density plantation, clearly demonstrate that the bamboo yield in Tripura is comparable to high density bamboo plantations elsewhere, particularly in China and Vietnam.

- 4) It is being observed that the quantum of Agarbatthi sticks produced manually, in Tripura and supplied to the Indian manufacturers has drastically declined from about 30,000 MT/year about 4-5 years back to current demand of less than 5000 MT/year. This scenario has been the result of uninterrupted large import of round bamboo stick & raw batthi from Vietnam and China. As compared to the size of investments and end to end supply chains for bamboo industry in Vietnam & China - Tripura has not been able to make commensurate investment & progress in setting up modern units. If Tripura has to regain its place of pride in respect of these products, an estimated investment of about Rs. 150 crores, would be needed towards setting up at least 2000 round stick machines in about 40 units (each unit with 50 machines). This would mean that, by investing Rs. 150 crores, the state could bring a gross revenue of more than Rs. 350 crores per annum.

In terms of employment each such unit may generate direct employment to about 200 persons. Indirectly through higher investment in plantation and allied activities would additionally generate employment for another 300 persons. Thus, setting up of 40 units may generate employment for about 20,000 persons. With the existing schemes of skill development and make in India programme, these ventures thus offers huge economic and employment. If part of this production is value addition, through making of masala batthi, perfuming, packaging & selling, may bring a return of Rs. 800 to Rs.1000 per kg of finished products. It is to be noted here that, up scaling of this magnitude would require a dedicated team of industrial & marketing team to assist TBM at least in the initial 2-3 years.

Also adequate focus is needed on resource augmentation to meet the raw material requirement of various industries. And the bamboo process waste need to be gainfully utilized as it is amounting to over 60% of quantity & has proven technology solutions / applications for enterprise development.

- 5) The Tripura Bamboo Mission has been implementing various activities outlined in the strategic document prepared in 2006 for about a decade. The Mission has been largely implemented by a professional organization IL&FS with great efficiency

despite many challenges mostly on account of financial constraints and to some extent lack of manpower. The Mission has focused on all activities provisioned in the Mission Document. These are resource development, cluster development & technology induction, institution development, capacity building, mobilization of financial resources, resource augmentation through private plantation, market development etc. They have successfully demonstrated the model of using MNREGA resources for the benefit of creating resource in shortest possible time. About 1000 ha of bamboo plantations have been raised on beneficiary's fields and this tempo continues to build up on by implementation team. Despite many eyebrow raised about the involvement of a private agency like IL&FS it appears that government has fully recognized the efforts of present form of TBM which is a right mix of foresters and professionals performing without any scope of conflicts in implementation strategy.

- 6) All this and more can be expected only from a State like Tripura which is unique and therefore the multiple opportunities / applications of bamboo have been converted into rural employment and income of the dependent poor families through a number of promotional activities. These have to be up-scaled by invigorated efforts. Precisely, for these reasons and more it is strongly recommended to continue TBM and the present implementation mechanism with desired doses of enrichment.
- 7) In the past about 10 years of working, TBM has brought in over 100 agencies / consultants / partners / experts etc., for taking their help and advice in promoting the bamboo sector in the state. Broadly this is continuing even now. The time has come for TBM to further focus on reviving the relations for promoting bamboo based business in the state. Further, TBM may also study and adopt practices of successful ventures / initiatives across the country and forge linkages with them. Also such an understanding shall help TBM in designing a means and mode of bringing convergence across different departments of Tripura aligning with the mandate of strategic plan 2006.
- 8) It was decided by government of Tripura to formalize an institutional structure with a team of small number of executives and field workers who could understand the cross cutting issues of bamboo development sector in the state. This government team has to take into consideration the resources available in respect of bamboo and

artisans, and an appropriate agency who could create livelihood opportunities for the speedy socio economic development of the state. The choice fell on IL&FS. This organization has continued to implement the objectives, mission and goals set in strategy document. The past ten years have been a very rewarding association for TBM and implementing agency IL&FS. There is no short coming noticed in the present arrangement and therefore it should continue

### 9) Livelihoods of the artisans practicing Commercial Handicraft

The extent of livelihood from various economic activities based on bamboo processing has been given in following Table

Table: Extent of livelihood from some bamboo processing work

Category of Handicraft	Approx. No. of artisans	Turnover, Rs. Lakh	Wage component % in the craft	Total Amount disbursed as wage to artisans, (in Rs. Lakh)	Avg. Earnings per artisan per year, Rs.	Avg. Earnings per artisan per month, Rs.
Mat	2312	1037.55	40%	414.94	17945	1495
Baskets	5087	1421.56	70%	995.09	19562	1630
Furniture	555	384.21	40%	153.68	27693	2308
Other crafts	1295	998.93	40%	399.57	30858	2572
<b>TOTAL</b>	<b>9249</b>	<b>3842.05</b>		<b>1963.29</b>		

Source: TBM Reports for the year 2015-16

### 10) Some questions / observations and responses

Sl. No.	Questions / Observations	Responses
1	Whether TBM could have done better? Is the strategy of apportioning the role between TBM & Dept. of Forests for value addition and resource generation (plantation) respectively a correct	The present strategy of TFD efforts on raising bamboo plantations in forest areas should continue. TBM continues to mobilize the communities, particularly the cluster of farmers of SC / ST / BPL / small and marginal category. TBM is better equipped for raising bamboo plantations on RoFR lands through participatory approach. For value addition the current efforts of TBM have shown good

Sl. No.	Questions / Observations	Responses
	strategy?	results which need to be up scaled. The coordination and assistance of TFD to TBM may further help in achieving the objectives of state, because it is a right mix of ecological & socio-economic needs of the state.
2	How TBM could address the challenge and concern of the industry for ensuring sustained supply of raw material which is critical to investment in this sector?	There is a degree of uncertainty in procurement of raw material for private industries. In Karnataka for example the private particle boards with capacity of 2 m sq m or more have come up based on private Eucalyptus plantations. They are facing stiff competition for same material going to paper mills. The particle board industry is flourishing based on private supplies. Therefore, the activities of TBM with proper government incentives will ensure sustained supply of raw material to the existing & upcoming industries.
3	How to replicate the Anji county model of China in resource generation, industrial infrastructure development, Industrial policy etc in Tripura?	A delegation (with representatives from TBM, relevant government departments, industry, plantation owners, community, existing funding partners etc., associated with TBM) may visit China, Vietnam etc., who have adopted different models for competing in global bamboo market, to study of their strategies against - resource generation / community enterprise development / industrial tie up / accessing & competing in the global market & develop an Indian / state specific action plan. Government of Tripura should give priority to such action plan for implementation under TBM. Local farmers have started inter cropping of turmeric,

Sl. No.	Questions / Observations	Responses
		ginger etc. & they could be encouraged to take-up vegetable cultivation also.
4	Is it desirable to identify focused Blocks in districts for concerted efforts on collective action which may include fund raising & convergence, resource generation and subsequent activities to be more effective strategy in future?	Yes, it will be a good initiative. This will help in bringing convergence in activities being implemented by different departments under different plans, which generally happen with due involvement of district authorities. Also, it helps to reach out to most desirable locations, reduce administrative hassles and rope in authorities. For example MGNREG fund can be utilized for creation of large scale bamboo plantations and Industrial estates in the state can be improved to facilitate establishment of bamboo industries. Local entrepreneurs can be encouraged to avail the national and state level schemes for setting up of units - through District Industries centre. Entrepreneurs from outside the state can be encouraged to establish bamboo based factories where they will get required raw material from the nearby area and the district authority / local community / state Govt., can extend possible support & eligible incentives.
5	Local youth earning profit out of bamboo nursery and plantation	The NLFT has been more or less rehabilitated and therefore the villagers particularly the youth have taken bamboo nursery and plantations in Kanchanpur, Mohanbhog & Belbari. The farmers who were once engaged with Paddy and Vegetable cultivation are now turning in to bamboo growers as it is more profitable and there is a huge demand for bamboo made products traditionally as well as

Sl. No.	Questions / Observations	Responses
		<p>in industrial and construction activities. Also, it is to be noted that intercropping with Ginger is already being practiced &amp; intercropping of vegetables also could be considered. A number of locals (youth) in Kanchanpur area have started this on SHG scale and are earning profits. It is important for TBM to identify such SHGs to mobilize youth for raising nursery and plantations of bamboo. The experience in this area is very rewarding and worth emulation elsewhere.</p>

## **7.2. Revisiting the TBM Strategy**

### **1) Is the strategy developed in 2006 still relevant in present context? Are the focus sub-sectors, process identified in the beginning still relevant in the changing market scenario?**

The strategy document that was prepared by IL&FS in 2006 has been the 'Bible' of TBM which gave the basic platform, justification & guideline for execution of its activities. The strategy was prepared through a series of consultation process with all the stake holders, business houses within and outside the state and the availability of bamboo resources within the state, skill set of the local artisans, market condition and trend prevailed during year 2006 and within the prevailing legal framework for industries and Business. However, with changing scenario and eco-system dynamics, it is obvious to revisit the strategy developed a decade ago.

#### **Sticks sub sector**

Incense or Agarbatti Sticks has seen the highest growth rate among other sub-sectors and it has been the major contributor to state's bamboo economy & livelihoods. However, during last 2-3 years, following changes are being observed in the sector where Tripura is one of the key basic raw material suppliers for the whole incense sector of India.

- **Import of bamboo stick and raw agarbatthi:**

As per Union budget on February 28, 2011, under clause 182, second point Speech of Union Finance Minister - Reduction in basic customs duty on bamboo for agarbatthi from 30 per cent to 10 percent.

This reduction, over a period of trade & commerce, has posed serious implications on the livelihood of over 150,000 artisans who were working in lowest ladder of the incense value chain in Tripura. The home-based workers produced bamboo sticks which contributed less than 1 (one) per cent of the final value added product but it is a substantial income to the rural artisan families of Tripura and a major contributor to the bamboo sector turnover in the state.

Similarly the import of round bamboo stick from Vietnam and China now become cheaper for Indian incense entrepreneurs. India has imported 20,341 MT & 18,753 MT of bamboo stick during the FY 2015-16 and FY 2014-15. The sale of bamboo stick from Tripura verses the import of bamboo stick to India during the last 10 years can be tabulated as follows:

Financial Years	Supply of bamboo stick by Tripura in MT	Import of bamboo stick by India, in MT	Import of raw agarbatthi, in MT
FY-06-07	20,508.00	3,092.71	Not Available
FY-07-08	22,105.50	1,781.10	NA
FY-08-09	25,195.00	662.08	NA
FY 09-10	28,589.00	788.58	NA
FY-10-11	23,177.50	2,069.10	1,564.00
FY-11-12	21,393.00	4,268.25	4,653.00
FY-12-13	17,490.00	7,007.31	8,359.00
FY 13-14	9,749.00	8,147.00	66,214.00
FY 14-15	6,291.00	18,752.79	82,739.26
FY 15-16	4,063.00	20,341.67	69,340.04

**Source:** <https://www.zauba.com/import-raw+agarbatthi>

Because of reduction of import duty, total cost of receiving goods, including retail purchase price, transportation costs, duties, value added taxes, excise tax and other taxes — of machine rolled batthi at Bangalore is around Rs 67 to Rs 74 per kg from the Northeast and the landed price of rolled batthi from Vietnam is Rs 55 to Rs 66 per kg.

This has caused share of imported products out of total demand has increased from 10% to almost 65% during FY 2014-15. At the same time Domestic supply of incense sticks has been reduced by 40 per cent over past two years.

▪ **Change in Technology/ Product Standard**

In last 2-3 years, the Agarbatthi sector experienced a paradigm shift in technology/ product standard from manual to mechanization.

- Hand rolled Raw Batthi (masala batthi) has been replaced by Machine Rolled Batthi (extruded batthi). While this has improved the product quality/standard, but installing equivalent number of Rolling Machines requires huge investment
- Square Sticks (hand/ machine made) used for agarbatthi has been replaced by Round Sticks, which are again produced from fully mechanized units. Essentially, revamping all existing square sticks units for round sticks requires investment as well as capable entrepreneurs.

▪ **Imported Stick making Machines not adjustable/ compatible with local bamboo**

Reciprocating to the change in technology, few units of different scales were set up in India, mostly in Tripura. At present there are 8 units of round bamboo stick production. However, the sourced technology and machines are not readily adjustable or compatible with the local wild bamboo available in India, especially North East & Tripura. The machines developed by other countries are based on monopodial straight bamboo, which is not the same case in India in terms of species availability.

However, in last few years lot of effort has been made in customization of technology resulting in development of machines compatible to bamboo species available in India. Moreover, high fluctuation in Rupee vs Dollar and difficulty in import by small traders, there is significant demand for round sticks & raw batthi made in India, particularly Tripura.

We are highlighting difficulties in the equipment & (what is the suggestion from consultants / expectation from TBM ??)

TBM should focus on technology based production units supported by competent entrepreneurs, CFCs, credit link, start up schemes, Mudra schemes etc. Manually produced sticks and square sticks have limited scope to meet the changing incense sector trend.

### **Mat (Dhari) sub sector**

TBM focused on this sector based on the skill set and bamboo availability to meet the intermediately raw material requirement of 11 bamboo Mat Ply industries working during that time. It is to mention that, National Mission On Bamboo Application, Delhi also supported such units and tried to create an alternate to plywood, which is based on fast renewable resource(Bamboo) compared to wood-veneer ply.

Effort has also been made by TBM to use bamboo mat ply as construction material for 16 CFCs established across Tripura. However, the technology has some limitation in terms of following points.

- Economic aspect: Dhari mat used for making bamboo ply costs very high because of its long manual production process and availability of specific bamboo resources (long intermodal bamboo like Dolu). Recently, the technology based on crushing & compacting the bamboo has been found to be more economical, durable & useful compared to mat based composite boards/ ply.
- Technological limitation: Bamboo mat ply proved to be not a suitable construction material for exterior and exposed construction. It quickly absorbs moisture in wet climate and crumbles and bends in dry and hot climate.

Based on the above limitations, the Mission could conclude not to give emphasis in promoting Dhari Mat sector which itself is not able to sustain during last 10 years' effort. However, production of Dhari for local use as construction utility is being promoted by TBM.

It is to be observed that in China, industry has focussed on using slats as a core material & mats for face (i.e. top and bottom layer), which gave them a techno-commercial advantage. TBM should consider this angle & advice the existing units for possible revival. Also, the bamboo farming community should be enlightened on this & be supported to setup appropriate pre-processing units and enable market linkages with industry.

### **Handicrafts Sub-sector**

While Tripura has a long tradition of bamboo based handicrafts, it is observed that, the traditional artefacts are gradually replaced by contemporary utility items.

- Promoting and positioning Craft products as purely handcrafted items may not be viable and sustainable in long run
- Substitutes like plastics and imported machine made products of similar category at comparatively cheaper rate are eating the market of Handicraft
- Sometimes there are transport limitations and hindrances in bulky/fragile products

Out of the various categories of bamboo handicraft like bamboo baskets, bamboo rolling mat categories provides maximum employment and revenue to the state. The bamboo baskets produced in various clusters of Tripura are available all across the country because of its volume, quality and price offered. The State is able to produce and sell around five to six lakhs of bamboo basket per month and all the major market of India are loaded with Tripura Baskets only. No other bamboo cluster of India is able to compete with the bamboo clusters of Tripura. Similarly the bamboo mats of Tripura are well placed in the national market and Tripura is able to produce around 100,000 running meters of bamboo mat. Keeping the present position of the Tripura handicraft products in the Indian market, TBM shall continue to support and bring more innovation and strength to the sector.

There is a significant demand in high end niche market, which shall be explored. To meet the current trend in the handicraft sector, TBM shall go for more of semi-mechanization and fusion of bamboo with other materials. This sector can go a long way in contributing to bamboo sector of the state and also the country.

### **Furniture Sub-Sector**

Furniture was one of the major sub-sectors keeping the availability of suitable bamboo species, kanakkaich, betu, barak etc., along with skilled manpower & this furniture sub-sector can be a priority in the coming days.

Till now, the limitation of bulky furniture was major hindrance in the growth of the sub-sector. Bamboo furniture has good demand in the tier-I cities where people see bamboo as luxurious, trendy and eco-friendly product.

However, the evaluation team visualizes good opportunities for knocked down furniture and furniture components to be exported from the state. The sub-sector needs technological innovations coupled with strong enterprise support programme to take this forward.

Also, the skillsets available with the people in furniture sector matches the requirement of bamboo pole based structures. Thereby, production of pre-fabricated bamboo structures, structural elements, false roofing panels etc., should be seriously considered for promotion.

### **Industrial Application**

As envisaged in 2006-07, TBM has promoted one exclusive industrial park for bamboo which is first of its kind in India with all the infrastructure facilities & utilities. A large scale bamboo wood manufacturing unit is already operational in the park apart from a bamboo round stick unit. Potential industries that can be promoted include - bamboo based textiles, furniture, fibre based composite wood, moulded furniture, energy, round sticks, blinds, chopsticks, charcoal, briquettes, activated carbon and various associated products etc.,.

For new industry to come up in Tripura, once it is established that adequate quantity of desired species of bamboo in desired form is available. Simultaneously an eco-system has to be created by which bamboo farming communities are able to setup pre-processing facilities and industry is geared up to enter into tie-ups with such pre-processing facilities. Such an effort has to be of utmost importance for Tripura Bamboo Mission for promoting industrial application of bamboo.

### **Resource Generation**

During the initial years, TBM could visualize a role of coordinating agency at the state level for enabling plantation of cluster specific bamboo. The Plantation sub-committee of TBM was headed by PCCF. Main role of TBM envisaged by the state was to coordinate plantation based activities, train & develop technical

manpower, sensitize the administration in generating cluster specific bamboo. However, the actual plantation activity was supposed to be undertaken by the Forest department in the forest lands.

During 2<sup>nd</sup> phase, it was realized that the plantation created by the forest department is sustaining and fulfilling the demand of the clusters, because of non-convergence / no alignment of different departments, no protection of plantations by the public from non-sustainable harvesting and systemic incoherence leading to delayed plantation, insufficient funds etc..

At the same time, the forest department could lose about 1.72 lakh ha of land to the forest dwellers following induction of Forest Right Act 2006, which also led to clear felling of bamboo.

However TBM, with support from MGNREGA, could develop a model / methodology to support small and marginal farmers, RoFR beneficiaries in creating commercially viable high density bamboo plantation of required species. This success goes to the participatory approach and involvement of Panchayat/ local PRI bodies and farmers. The high density plantation providing better income to the growers as bamboo productivity increased upto 20 times.

It is therefore suggested to prioritize and focus on the following sub-sectors

- i. **Incense Sticks** (Round Bamboo Sticks, machine rolled batthi, perfumed batthi) and sticks for other industrial purpose
- ii. **Crafts** (focusing on semi-mechanized products along with fusion of bamboo with other materials)
- iii. **Furniture& structures** (round pole knocked down furniture & furniture components, prefabricated structures & structural elements)
- iv. **Industrial Products** (engineered bamboo products involving high tech mechanization)
- v. **Resource Generation** (high density commercial bamboo plantation in private lands)

The focused interventions should be

- i. **Institution Building** (including the field level players, at different levels of artisan bodies to traders' consortium etc.)

- ii. **Skill Development** (at different levels on aspects covering both technical and domain skills to soft skills for artisans. And enterprise development skills to be imparted among existing & prospective entrepreneurs)
- iii. **Product Development** (designing and developing products with market feedback; market testing and disseminating to the cluster) **& enabling market access**
- iv. **Technology Induction & Customization** (developing, sourcing, customizing and inducting techniques/tools suiting the locally available bamboo)
- v. **Market & Supply Chain development** (targeting bulk buyers, exports, online platforms etc. and stock points / warehouses under different business models i.e. creating dealer network or by associating with state level bamboo missions and creating warehouses etc.,)
- vi. **Infrastructure Development** (organized production centres, CFCs, Raw Material Banks etc.)
- vii. **Awareness & Promotion** (for awareness/ promotion of support schemes, projects initiation, project outcome etc. through media, publication, videography etc.)

### **Implementation Mode**

With a small but an experienced team, the task of field level implementation directly by TBM may limit the scope of scaling up of its activities. Rather TBM may create/ involve/ network with different groups/ task force/ field level technical & business concerns in executing/ delivering the programme. The core TBM team can do the supervisory/ monitoring role rather than hands on activities on the field. This will increase the operational efficiency of TBM, in up-scaling its activities & to undertake larger and multiple projects.

### **Priority Blocks**

It is suggested to identify Priority Blocks/ Clusters where the activities/ interventions can be done in large scale, focused and integrated manner. This will help to transform these clusters into bigger model clusters. Priority Blocks

can be selected based on their history, skill level, volume of business, artisan base, proximity to raw material (bamboo) catchment areas etc.

## **2) Do the subsectors identified and program focus during the last eight years still carry same priority?**

As mentioned above, some sub-sectors may not be prioritized much and some sub-sectors may be prioritized with focused approach.

- **Sticks sub-sector:** Shall be prioritized focusing on round sticks for incense
- **Mat (Dhari) sub-sector:** Shall not be prioritized considering low demand & complex market dynamics.
- **Handicraft sub-sector:** Shall be prioritized focusing on semi-mechanization and fusion of materials
- **Furniture sub-sector:** Shall be prioritized focusing on knocked down products and product components
- **Industrial Application:** Shall be prioritized focusing on high tech units and engineered bamboo products.
- **Treated bamboo poles:** should be prioritized and market development should be initiated.
- **Resource Generation:** Shall be prioritized with focus on large scale high density commercial bamboo plantation in private lands

## **3) What should be the priority areas and aspects for the next 10 years to meet the overall Vision, mission and objectives of TBM?**

The priority areas for the next say, 10 years shall be

- i. **Incense Sticks** : Round Bamboo Sticks, machine rolled batthi, perfumed batthi and sticks for other industrial purpose
- ii. **Crafts:** Focusing on semi-mechanized products along with fusion of bamboo with other materials
- iii. **Furniture:** Round pole knocked down furniture & furniture components
- iv. **Industrial Products:** Engineered bamboo products involving high tech mechanization
- v. **Resource Generation:** High density commercial bamboo plantation in private lands

The resource augmentation, bamboo forest certification, research and development focus, accessing international markets through bilateral cooperation should be given due importance. The TBM has been actively battling for more industries to set up their plants in Bamboo Park. This will need greater support from government-industries department and forest department in particular. There is always a criticism for lack of convergence. This has been addressed by approaching and accessing funds from different agencies and departments. The time has come to look to international agencies such as ITTO, UNDP, UNIDO etc.

### **7.3. Assessing the Progress Achieved**

**To what extent has the project achieved its overall objectives and what are the major achievements of the project**

Turnover	Increased from Rs 28 cr in 2007 to Rs 121 cr in 2014, and has dipped to Rs 80 cr in 2016 mostly due to decline in incense sticks
Livelihood Creation	<ul style="list-style-type: none"> <li>• Handicrafts: 20,000 artisans earning Rs 4000 – Rs 8000 / month</li> <li>• Incense Stick : 55,000 producers earning Rs 2000 – Rs 4000 / month</li> <li>• Rolled Batthi : 1000 rollers earning Rs 3000 – Rs 5000 / month</li> <li>• Plantation: Rs. 1 – 1.50 lakh per ha per annum</li> </ul>
Skill Training	Over 45000 persons in different aspect of handicraft, incense & resource generation
Infrastructure	19 Cluster level CFCs and Bamboo Park established
Technology Induction	<ul style="list-style-type: none"> <li>• Introduction of power tools in Handicrafts</li> <li>• Mechanization in Incense rolling</li> </ul>

	<ul style="list-style-type: none"> <li>• Introduction of High Density Bamboo Plantation</li> </ul>
Market Promotion	<ul style="list-style-type: none"> <li>• E-Commerce through leading portals (amazon.com, flipkart, Giska) and own portal tripurabamboo.com</li> <li>• Market support through linkage with leading retailers and distributors through apex marketing Company SHPPL</li> </ul>
Design Development	<ul style="list-style-type: none"> <li>• Over 500 new designs developed and commercialized</li> </ul>
Fund Mobilized	<ul style="list-style-type: none"> <li>• Total 68.95 cr has been mobilized largely from various Central Govt. sources</li> </ul>

**4) What are the major area of shortfalls and reasons leading to these shortfalls & possible remedies**

- i. The overall turnover of the bamboo sector is in declining trend in last 2 years. This is mainly due to downfall of Incense sector due to various factors/ reasons as described earlier. There is immediate need to focus on establishing round bamboo stick units with a projection of reaching reasonable volume within a short period. This will arrest the declining trend and gradually increase the business turnover.
- ii. While lot of designs of handicraft were developed and batch production organized through different producer groups, there is still inadequacy in generating orders. This may be due to lack of a dedicated marketing team/platform, despite having well defined marketing strategy. However, with the commencement of operations by Simanta Handicraft Products Pvt. Ltd. (SPV promoted for marketing), it is expected that market penetration in tier-I cities will happen effectively to generate sufficient orders to keep the production activities to continue round the year.
- iii. Lot of potential has been observed in furniture sector; however the sector could not be scaled up to desired level due to traditional designs (i.e. not mastering the designing & production of knocked down furniture) logistics/ transport issues as the present means of transport (by road) is costly and has high risk of damage. Also, lack of adequate number of

entrepreneurs & accordingly insufficient treatment plants hindered bulk production of furniture. It is expected that, with commencement of BG train line in few months, the issue of transport will be sorted out. TBM should enable establishment of treatment plants and other facilities in clusters to encourage the producers.

- iv. The industrial sector could not grow sufficiently due to lack of knowhow on technology, overall running of an industry and as well as not working on gainful utilizing the waste coming out of the existing units. TBM should motivate local investors and promote/ support them to go for technology intensive bamboo based industrial units at different facilities across the state, such as Bamboo Park and Industrial Estates. Accessibility to required quality of bamboo and outbound logistics problems remain as the main issues.

**5) Constraints under which the program has been implemented-financial, structural, institutional and related policies.**

- i. The total amount mobilized by TBM Rs. 68.95 cr over last 9 years, out of which Rs. 39 cr was sanctioned directly to TBM and rest amount was for the creation of the bamboo Park (industrial). However, more than Rs. 4 cr is yet to be released. During last 3-4 years, the fund flow was not timely & smooth, due to various reasons like, change in administration, change in central government, state election etc.,.
- ii. While TBM was set up to coordinate all bamboo based activities in the state, it is a fact that, out of total fund mobilized only a small portion was from various state govt. agencies.

**6) Describe the process of institution building and the coordination / convergence between the various stakeholders involved (Community, Private Sector, Government Departments) for the overall implementation of the project**

TBM was created with the objective being the single point agency for coordinating bamboo related activities and it has been well established among the bamboo stakeholders in Tripura & also at the national level bamboo forum/

community. It is working in private public partnership (PPP) mode which is very effective in implementation without creating long term liabilities to the state government. Because of this, working with any community, public, govt. & private sector is more coherent and less of formalities.

However, bringing various initiatives in Bamboo, by different departments under a common framework is the need & government of Tripura may look at this need & possible mechanism for bringing the synergy.

## **7) Document major lessons that have emerged over the period**

- i. **High Density Bamboo Plantation:** The high density bamboo plantation (HDBP) implemented by TBM has established as an innovative and commercially viable model. This is evident from the facts that the local community has accepted the model and it seems, the state forest department have inducted it into its programmes. The model entails refurbished way of plantation with higher number of plants coupled with systematic & scientific way of management; this results in yielding 20 times more output than the traditional method. And intercropping of other plants in the initial years, results immediate income.
- ii. **Stick Producers' Cooperative:** TBM could successfully organize the primary producers/ aggregators of bamboo stick under a cluster/ forest division to form their own cooperative society and linked the society to buyers outside the state. This was achieved with close coordination of producers and forest department, showcasing community empowerment and successful coordination & convergence. As stated during earlier review documents also, the model started with Bagafa Forest Division in South Tripura (Pilak Agarbatthi Cooperative Society) and was replicated in other forest divisions of the state.

## **7.4. Recommendations and Future Strategy**

### **7.4.1 Describe the strategy to improve the sustainability of the project outcomes and build the potential for replicating the approach with focus on changing international trade regime, market dynamics, sustainable raw material availability and available technology.**

It is a fact that, despite enormous challenges due to internal & external factors,

TBM spearheaded the effort in sustaining bamboo sector in the state. It is suggested that following areas need to be emphasized.

- Augmentation of Resource Generation
- Promotion of Entrepreneurs to set up mechanized units
- Awareness and effective information gathering & dissemination.
- Induct adequate number of manpower & equip TBM.

**7.4.2 Can the mission focus on other natural fibre available in the State to meet the challenges related to diversification of the product portfolio and the sustainability of the raw material requirement?**

In case TBM wish to expand & explore natural fibre sector, Tripura has larger resource of Pineapple fibre only. Considering the effort Vs impact, It is not advisable for TBM to diversify to natural fibres in general & pineapple in specific, as the extent of availability, accessibility, % recovery of fibre & commercial benefit of working in these materials is not encouraging. However, there is a possibility, rather opportunity of fusing with other materials (including natural fibres) with bamboo as basic & major raw material.

**7.4.3 Suggest the way forward and a long term strategy for the development of the bamboo sector in the state.**

This is described in detail in the section 'TBM Outlook 2025'.

## **8. Strength of the TBM implementing agency: IL & FS**

IL & FS, having separate verticals & teams covering multiple sectors vide., Infrastructure, Skills, Clusters, IT, Education etc., have deployed a team to initiate & develop TBM, as a sustainable organization. Over a period, IL & FS spread its portfolio of services in Tripura and helping the initiatives of state government of Tripura. Though the ongoing effort is causing fatigue among the team, considering the importance of Bamboo for the state of Tripura & India, and the opportunity for TBM / IL & FS to expand to other states, efforts are being continued in making the overall initiative / strategy document of 2006 fructify.

### **8.1. Strengthening of Tripura Bamboo Mission**

The present implementing agency IL&FS has been successfully implementing the objectives and strategic plan of Tripura Bamboo Mission. The present team at TBM is a mix of IL&FS professionals and foresters. The director of TBM is necessarily a senior forest officer and with an exception of few field level foresters, the implementing team, by and large comprised of professionals. This team has worked for about 10 years with exceptional cohesion & a review of effectiveness of the present formation indicates that this is the best combination, in the present circumstances.

However, with the increasing workload against different activities like:

- resource augmentation and mobilizing funds
- promoting artisans and cottage industries
- promoting industrial use of bamboo for production of high value products
- development of markets and backward and forward linkages
- providing consultancy services etc.,,

there may be requirements to have more professionals in the team. At present it is not necessary to suggest the exact size of the team but as the work progresses the TBM may induct new colleagues / hire consultants and domain experts for up scaling the activities. It could also think of having one or two advisors on retainer ship or in its board, drawn from forest, processing, marketing and allied sectors, which can be decided later on.

## **8.2. Feasibility of alternative implementing agency**

Needless to say the present arrangement has demonstratively given good performance which could be measured in respect of dimensions such as

- Reach & approach in implementing such a state level initiative
- social and socio cultural
- economic and production
- ecological and environmental improvements
- operating the mission towards achieving sustainable institutional structure.

Therefore, the present arrangement with the implementing agency & the present arrangement of having a mix of foresters and professionals from IL&FS should continue to fully implement the outlook 2020 of bamboo sector in Tripura.

## 9. TBM Outlook 2025

### 9.1. Key Recommendations

- i. The TBM has so far concentrated on growing Kanakaich bamboo (*T.oliveri*). They need to take up other species like *B.balcooa*, *B.tulda*, *B.cacharensis*, *D.longispathus*, *B.polymorpha*, *M.bacciferra* in different clusters where the demand for these specific species of bamboo is in high. As the seed of these species are not available in large scale, the mission can explore creating tissue culture nurseries hardened in local conditions for better survival and growth of the plants and quick return to the farmers.
- ii. The package of practice of high density plantations be considered, which enhances the economic benefit & to motivate the farmers, thereby the state to have adequate quantity of raw material for different purposes.
- iii. The MNREGA plantation raised on farmers fields have been more or less a free of any charges to beneficiaries. This needs to be re-examined to ensure creation of a dedicated fund for the benefit of other farmers. TBM should organize the bamboo growers into institutions and encourage the institutions to create a bamboo rhizome bank. This bank can help upcoming plantations when there is no MNREGA or other financial support from Govt.
- iv. Inter-cropping of Sugandhmantri, ginger and turmeric promises annual returns to the beneficiaries from the first year itself which may offset the cost incurred by them in the maintenance of plantations. This will create interest among the farmers to maintain the plot in a better way.
- v. Private bamboo nursery should also be encouraged under the on-going program of TBM, particularly the species for which planting material is not readily available. The species may be *B.balcooa*, *B.tulda*, *B.cacharensis*, *D.longispathus*, *B.polymorpha*.
- vi. In the basketry and other artisan units full and effective participation of larger number of members need to be ensured so that one particular person/limited no. of persons will not be able to take the whole benefit themselves. This observation is based on a visit to a unit at Udaipur. The infrastructures created by TBM are generating income part of which should be contributed to a special fund for further development and welfare activities. This may ensure long term sustainability of

the efforts of TBM.

- vii. The exposure visits of artisans/ entrepreneurs to China, Vietnam and even within India will help them acquire knowledge about the variety and quality of products being produced through different technology & process to meet the requirement of international & national market.
- viii. The TBM should plan opening out-lets on commission basis in major Indian markets outside and within the State of Tripura.
- ix. The continued declining trend of production & demand of bamboo sticks from Tripura on account of large scale import from Vietnam & China is a serious trade issue to which TBM with the attention & support of Industry department take measures to regain the pride of place in this respect. This requires more round bamboo stick units with desired modernization and skill up gradation to cope up with this unprecedented happening. The skill development ministry needs to be approached because it is connected with employment of large workforce and trade balance.
- x. The TBM has great relevance in creating private participation models in resource generation, value-addition and development of market linkage. There cannot be a period prescribed for the existence of TBM. It has performed well in addressing the ecological, social and economic dimensions by their Mission approach. They will always have this relevance so long there are bamboo resources and market for the products and services from Bamboo.
- xi. TBM was a concept of development of green economy for the land locked state of India. It has endured the long cherished objectives of developing bamboo sector in all its facets. It continues to do so now and beyond & therefore it cannot be bound in a time frame of 5-10 years. Let this mission -mode program continue serving the sector and people dependent upon this in the State as well as elsewhere.
- xii. TFD has been raising large scale bamboo plantation and generally they are of good quality. However, in view of 'free access to resources', which are contrary to the requirements of Sustainable Forest Management enunciated by working plans prepared in the state protection and productivity of bamboo resources will continue to be a great challenge. Thus the TBM model involving needy communities will continue to be relevant and a good alternative to not responsibly

managed government owned bamboo forests of the state.

- xiii. Bamboo based industrialization has truly commenced with Bamboo-wood manufacturing units. More such units have to be encouraged. TBM has been constantly pursuing the task of attracting prospective entrepreneurs. This with full backing government may start giving results soon.
- xiv. AnR& D as well as dedicated market enabling team within TBM / IL&FS has become important and is strongly recommended.
- xv. The implementing agency IL&FS has developed replicable model of peoples participation in growing bamboo to augment dwindling resources. The efforts have successfully tried to reverse the ongoing craze for converting bamboo into Rubber plantations. People are gradually convinced about planting bamboo as against Rubber as it has better economics, short gestation period and from initial investment points it is more suitable to farmers having small and marginal farm lands currently not used for agriculture and other crops.
- xvi. It has been further demonstrated that a mean and lean organization like IL&FS could be more effective than a full fledged down-the line forest cadre. Thus, there is a felt need that the present association between TBM and IL&FS should continue for the good of the sector and people of this state.
- xvii. There are a number of organizations working on different aspects of bamboo sector in the state of Tripura. Some of the prominent organizations engaged in bamboo sector are as follows:
  - Tripura Bamboo & Cane Development Centre (TRIBAC)
  - Centre for Forest Livelihood & Extension ( Centre under ICFRE Dehradun)
  - Bamboo & Cane Development Institute
  - Tripura JICA Forestry Project
  - THHDC- Purbasha
  - Tripura IGDC
  - Dept. Of Handloom, Handicraft & Sericulture

To ensure effective convergence which will be critical to ensure better impact of programmes and higher returns on investments, TBM could be used as the single point platform/ institution. For all bamboo related activities, TBM & other

organizations can plan the activity collectively with specified Roles & Responsibilities and assigned / deputed manpower. Also, the government may consider to place the collective budget to TBM for effective implementation and monitoring at the state level.

xviii. TBM should try to access international assistance and co-operation for sustainable development of bamboo based socio-economic development of state.

- The international agencies like International Tropical Timber Organization (ITTO) to which India is a prominent member has been supporting some projects in the country.
- Bilateral cooperation with China and Vietnam could also have been useful for development and use of technology for production of goods for accessing international markets.

xix. In North- East also the TBM could play an important role, by extending consultancy services. It was indicated that IL& FS has been considered by Government of Nagaland for helping them in their initiatives in Bamboo.

xx. In many states of India, State Bamboo Missions have come up. TBM with about 10 years of field experience, it could take-up consultancy and networking for promotion of bamboo based enterprises so that no bamboo without processing goes out of the state. Also, this shall help TBM & different states to come out with exclusive bamboo outlets & supply chains – as a collective effort.

Bamboo sector has tremendous economic potential and therefore developing all aspects of this sector- social, ecological and economy would require more attention in the coming years and therefore it would not be feasible to divert the attention to other fibres and NTFPs. The present set up of NTFP Center of Excellence is well placed to take care of the medicinal plants and NTFP sectors.

xxi. Tangible and intangible benefits have been flowing out of the activities of TBM. It may be necessary and desirable to assess these benefits for demonstrating the effectiveness of people's participation in greening of waste/ wastelands particularly for generating sustained livelihood to rural poor. Since this requires a kind of third party assessment, such work could be outsourced.

- xxii. TBM's efforts of greening are supplement to the efforts of forest department. Thus, this should also be considered as a modest effort in minimizing the harshness of climate change in the state.
- xxiii. More vigorous efforts in creating bamboo based entrepreneurs is essential. TBM / IL&FS should consider a group of dedicated personnel with expertise in enterprise development. The state government should also provide necessary support for this effort. This is in the interest of economic development and for economic utilization of growing bamboo resources in the state.

## **9.2. Way Forward**

- i. Since the state has witnessed that the existing revenue & employment potential of Bamboo Round Stick has gone to Vietnam & China in last 3-4 years, it is high time that Government of Tripura, TBM / IL&FS, take aggressive measures to set up 40 units with 2000 round stick machines to produce about 30,000 MT of sticks which used to be the total annual production of the state only a few years back. This would require an investment of about Rs. 150 crores which if materializes will bring revenue of more than Rs. 400 crores and direct employment of about 8000 persons. We, therefore, strongly recommend that the state (TBM) should approach the Ministry of Skill Development and Make in India programme. This is a case as to how the economic opportunity from one of the North Eastern states with lot of bamboo resources has gone to our neighbouring nations probably due to lack of our competitiveness. If we have to match this competitiveness, then the proposed investment of above magnitude is needed for setting up of appropriate units with modern facilities & technology.
- ii. Bamboo based industrial development is today faced with the legal & policy hurdle on account of requirements of multiple point transit pass. The present transit rules should, therefore, be revisited and in collaboration with other North Eastern states attempt should be made to make them smooth and amenable. The private grower also feels disappointed on account of levy of royalty which is unjustified.
- iii. There is a need for **Rapid Resource Assessment** (RRA) of different types and

location of availability of bamboo resources. It will be desirable to document supply and value chain of bamboo and its products. This will be helpful in attracting entrepreneurs. Appropriate organizations could be contracted to complete this assessment in next 6 months or so and prepare a detailed inventory of resources and other infrastructure available in the state (communication- road & rail, connectivity, ease of doing business, uninterrupted power supply, water, land, labour etc.).

- iv. There is a need for forest certification for sustainable management practices in bamboo forest/ plantations. There is no government sponsored agency in India. There are a few private agencies who could be contacted to take up this work. Similar work has been done in Tripura Forest Development Corporation and many other forest corporations. Recently, Madhya Pradesh Forest development Corporation has given this work to **Woodcert**. There are other agencies like **Rain Forest Alliance, SGS** and some more.
- v. With several positives (e.g. abundance of resources, communication & connectivity, infrastructure, good governance and legal & policy framework etc.) there is no reason why industry should not use the opportunity to invest in Tripura. It appears that, the state should aggressively market Tripura, its resources and potential for industrial development. It is strongly recommended to identify **Mentors** for providing necessary assistance in this regard.

### 9.3. Future Turnover Projection

Sub-sector	Turnover Target (Rs Crore)	Infrastructure/ units to be set up	Estimated Production Volume / turnover	Estimated Livelihood Support, no. of households	Required Investment for the establishment & operation of units (Rs Crore)
Bamboo Round stick	215	850 round stick machines; Rs. 3.5 cr per unit of 50 m/c incl. building/work shed	15,300 MT (60 kg per m/c x 300 days)	3400	60
Perfumed and Packaged Agarbatti	85	10 perfuming units (incl. existing) with capacity to consume 7-8 MT raw batthi each per month	1000 MT of Agarbatti (Approx. 1.2 billion sticks)	600	23
Industrial Application of Bamboo	130	At least 3 large scale units & 3 medium scale/ ancillary units	Each large unit turnover of Rs 30 – 35 crore per annum; each ancillary unit turnover of Rs 8-10 crore per annum	800	25
Handicrafts & Furniture	60	100 units (incl. existing entrepreneurs, CFCs)	Per unit turnover of Rs 30 lakh – Rs 1 crore per annum	5000	90
Processed Bamboo	10	10 units with modern equipment& tools (including existing units)	20 lakh poles per annum valued at Rs 50 per pole	350	3
Bamboo Plantation	-	5000 ha of private land	80,000 mt/year@ 16mt/ha	10000	60
<b>Total</b>	<b>500</b>			<b>20150</b>	<b>260</b>

Source: Data provided by Tripura Bamboo Mission