TRIPURA BAMBOO MISSION

Project Strategy Document

MAIN REPORT

INFRASTRUCTURE LEASING & FINANCIAL SERVICES LTD.
STADD DEVELOPMENT CONSULTING PVT. LTD.

April, 2006

GLOSSARY

BCDI	Bamboo & Cane Development Institute
BDS	Business Development Services
BMCS	Bamboo Mat Corrugated Sheet
CBTC	Cane & Bamboo Technology Centre
CFC	Common Facility Centre
CII	Confederation of Indian Industry
Crore	100,00,000
DCH	Development Commissioner of Handicrafts
DPR	Detailed Project Report
ERG	Engineering Resource Group
FMCG	Fast Moving Consumer Goods
FRI	Forest Research Institute
GDP	Gross Domestic Product
GO	Government Organisation
GoT	Government of Tripura
IGNOU	Indira Gandhi National Open University
IISc	Indian Institute of Science
IIT	Indian Institute of Technology
IL&FS/ILFS	Infrastructure Leasing & Financial Services Ltd.
INBAR	International Network for Bamboo And Rattan
ISI	Indian Standards Institution
Lakh	100,000
MFI	Micro Finance Institution
MoU	Memorandum of Understanding
MoRD	Ministry of Rural Development
MT	Metric Ton
NER	North East Region
NGO	Non Governmental Organisation
NID	National Institute of Design
NMBA	National Mission on Bamboo Applications
Olom	Brand of Tripura handicraft products launched earlier
PPP	Public Private Partnership
PrIA	Project Implementation Agency
RGVN	Rashtriya Grameen Vikas Nidhi
Rs.	Indian Rupee ($1US =Rs. 45/-)
SGSY	Swaranjayanti Gram Swarojgar Yojana
SHG	Self Help Group
STADD	STADD Development Consulting Pvt. Ltd.
TBM	Tripura Bamboo Mission

TABLE OF CONTENTS

LIST OF ANNEXURES

METHODOLOGY

To realise the potential of bamboo sector in Tripura, Government of Tripura has launched the Tripura Bamboo Mission (TBM). One of first steps to be identified by the Mission is to develop a Project Strategy Document to lay down plans for implementation to achieve goals established. Government of Tripura jointly with NMBA have mandated Infrastructure Leasing & Financial Services Ltd. (IL&FS) to develop the strategy document for the proposed 3 year project.

IL&FS have chosen to collaborate with STADD Development Consulting Pvt. Ltd. to develop this strategy document given their experience in the bamboo sector and multi-disciplinary skills available within the organisation. To kick off the process a study team visited Tripura over 15 days in January-February, 2006.

Stakeholder meet in progress

The team commenced their visit by having a day long stakeholder meet well attended by over 60 stakeholders from government, civil society, entrepreneurs, community, bankers and industry associations. Various issues influencing the sector were openly discussed.

Meeting with SHG producers of fine stick mats at Jogendranagar

Visits were then undertaken over 2 weeks to more than 50 locations in West, South and North Tripura to assess ground realities. During this field visit the team had extended discussions with those involved with bamboo as livelihood activity. Efforts were directed at tracking the supply chain and identifying locations where sufficient activity was noticed justifying need to establish clusters. This would help develop scaling up plans for the sector to meet agreed goals.

This was followed by a visit to Kolkata, Guwahati, New Delhi, Mumbai, Bangalore and Mysore markets where users were met to assess potential. From various respondents met, many were probed to assess their keenness to help identify partnership possibilities. The response can be said to be heartening though it may be assumed to be conditional at this point of time (Annexure J covers people met during field and market visit).

REPORT STRUCTURE

The Tripura Bamboo Mission (TBM) report has been presented over 2 volumes as mentioned below. A mention needs to be made of the various studies undertaken in the past. Of these, the INBAR Study has been a fairly detailed study and has been referred to. Required base data has been used from these studies though current figures have been used to the extent available. Recognising past work done and data available on the sector as a whole, the effort of this study was more focussed on establishing a production system to achieve goals mentioned focusing on aspects of strategy and implementation. Should one feel the need to refer to historical data and efforts carried out in that regard, one should go through the INBAR Report. Detailed activities to be carried out will need to be covered through a Detailed Project Report (DPR) since a strategy study of this nature with its wide coverage can't be very detailed in nature.

The 2 volume report covers the following:

1. MAIN REPORT – This report presents an overall scenario, touching upon various facets and covering in detail aspects of vertical importance such as institutions, resources, technology, markets and capacity building to name a few important aspects. It also covers in brief, details of sub-sectors that formed part of the study as below and includes a summary of activities that need to be taken up on a priority basis. Detailed activity under various heads and budgets has also been presented as part of the Main Report.

   A summary of activities can be found at the end of the Executive Summary in the form of a business development plan. Annexures cover budgets, institution responsibility matrix, timeline of activities, number of enterprises proposed to be established, machinery overview, vendor details, among others.

2. SUB-SECTOR REPORTS – This covers a total of four sections as below and presents market potential and key strategy points required to achieve the potential. The sub-sectors are:

   a. Sticks, slats and derived products

   b. Mats and derived products

   c. Utility Handicrafts (including moulded products)

   d. Natural Round Pole Furniture

The Main Report has been written to give an overview to the sector from a mission perspective. The sub-sector reports on the other hand elaborate on specific issues of market potential assessment and feedback received to the suggested products.

STUDY TEAM

To improve the qualitative depth of the study a study team was set up bring together professionals from three organisations. The team consisted of experts drawn from Infrastructure Leasing & Financial Services Ltd. (IL&FS), National Mission on Bamboo Applications (NMBA) and STADD Development Consulting Pvt. Ltd. (STADD):

1.	R.C.M. Reddy (IL&FS)	Team Leader
2.	Krishna Kumar (IL&FS)	Project development, Institution, Finance
3.	Ravi Ranjan Mishra (IL&FS)	Credit
4.	Chelna Desai (IL&FS)	Design & Product Identification
5.	Suneel Pande (NMBA)	Technology, Resource
6.	R.L. Banik (NMBA)	Bio-resource
7.	Sanjeev Vasudev (STADD)	Project Strategy, Report Writing, Finance
8.	Sangeeta Agrawal (STADD)	Markets
9.	Rajesh Thadani (STADD)	Institution, Resource
10.	Sujit Choudhury (STADD)	Cluster Development, Institution

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Bamboo's utility to Tripura would rate very high in the social and environment context. Given ongoing efforts the time has come to meet economic objectives by scaling up activities. This will not only help address needs of market but also do justice to abundance of bamboo resource and high quality talent inherent to Tripura bamboo artisans.

Government of Tripura must be credited for the proactive role it has played and for its willingness to lend support to develop the sector to meet needs of its people. It has launched the "Tripura Bamboo Mission" programme to approach needs of the bamboo sector in the state in a targeted and professional manner. The Tripura Bamboo Mission is expected to deliver on two counts:

1. Doubling output from the sector in turnover terms
2. Doubling livelihood involvement with the sector

This has to be achieved on an overall sector growth basis.

Looking to core needs, institution and infrastructure development would rate very high. It is proposed that the State Government encourage the creation and development of a Project Implementation Agency (PrIA) to manage sector growth through entrepreneur based cluster development approach for the 3 year period. PrIA should be managed in an autonomous manner allowing independent functioning within an agreed framework. This would call for inviting an institution that has sufficient experience in formulating and managing a project using a cluster development approach, enabling PPPs, establishing institutional processes, addressing needs of infrastructure, and having the ability to mobilise finance for the task.

Tripura's isolated location necessitated from political compulsions obviously puts cost pressure on transportation both inward and outward, affecting commercial viability. Being surrounded by Bangladesh for a substantial section on its border does not help the situation considering trade options are not freely accessible. Of the four districts within the state, the district of South Tripura is the most affected considering its farthest location from the mouth of entry to the state. However it is Dhalai that is relatively closer to the northern point that is least developed. Thus, any planning for Tripura has to take into consideration resultant impact of transportation on raw material supply and markets. An element of neutralisation of this transport burden through a support mechanism may need to be considered normal to address Tripura's need to make it competitive from a national standpoint.

Due respect must also be given to aspects of social mobilisation given the existent social fabric. Fostering entrepreneurial skills and building a strong institutional system that will instil confidence with producers and buyers alike will be an important prerequisite.

MARKET POTENTIAL

Five product categories that have potential and have been the focus of study are:

1. Mats and derived products, eg. board, coverings & claddings
2. Sticks, slats and derived products such as fine stick woven mats, incense sticks, and as an intermediate product
3. Handicrafts of utility nature
4. Round pole furniture
5. Industrial products like charcoal and gassifier

Sticks: Tripura has made a name for itself in supply of incense sticks with nearly 17,000 MT of material shipped out every year. There is a need to upgrade the output of the sector and this is proposed to be done by raising quality (and hence realisation) through mechanisation, establish value addition facilities such as rolling of sticks, and finally by inviting large incense stick manufacturers to establish manufacturing facilities within the state. An indication of this has already been got from a large agarbatti manufacturer that needs to be pursued.

Other than incense sticks there is an immediate requirement from window blind weaving units and flooring units for sticks and slats respectively. These units, two in number have been established in Guwahati and are looking forward to entering into supply arrangements for their raw material needs. A point needs to be made that considering the early stage of growth of bamboo based value addition sector, these units are bound to be followed by many more such units creating a demand for more pre-processed material.

Mats: Seven mat based board making units have been established in the eastern region and they offer potential as buyers for woven mats. However experience from the past has not been very productive considering the unorganised nature of the sector, resulting in shortage of quality raw material. Based on discussions it has emerged that there is a potential to procure seven truckloads of bamboo mats totalling nearly 20,000 mats on almost a daily basis. This would require organising the mat weavers with accompanying mechanisation and skill upgradation. Once quality and cost needs have been understood, this sub-sector offers a stable supply based long term arrangement, though tied to fortunes of board manufacturers. Once production picks up, other uses can also be addressed meeting flooring and cladding needs for interiors for which developed clusters could themselves cope with production needs from existent facilities.

Utility Handicrafts: With changing lifestyles and preference given to green products the home accessory segment offers opportunity. Items like planters, laundry baskets, bowls, screens, offer an opportunity in urban areas to be sold through the large store format that has increasingly entrenched itself. These items are also the ones that could address export opportunities though by first establishing a tried and tested reliable, volume based production system. Given bulk needs of market and low level of mechanisation, role of consolidators and aggregators assume much importance to deliver large quantities of standardised products at economical costs. This is possible if a high quality of design input is maintained and can result in generating good employment opportunities.

Furniture: While metro markets seem the apparent choice, the demand for such items can be very strong in mini-metros. Considering overall improvement in purchasing power ability in urban terms and the need to set up new homes, this product category holds promise. Design will play an important role and constant new offerings will be needed to build excitement. If durability can be achieved against price positioning it will catch the fancy of young buyers. As discussed, considering distance from market and cost of movement, furniture must be manufactured in knock down form for easy and economical movement.

Details of above product lines can be found in the Sub-Sector Report and a summary table at the end of this chapter captures potential numbers from existent market viewpoint.

Industrial Products: It is being proposed that certain key technologies that have been developed and may have relevance to address Tripura's needs may be considered for deployment. While to begin they are being proposed as pilots, experiences gathered from such activity pursued will help assess their true potential for deployment. Among technologies proposed are bamboo-based gassifier for energy generation and charcoal units that entail low investment but can help feed needs of the agarbatti rolling sector as it picks up. These technologies will be deployed in the field with support from National Mission on Bamboo Applications, Dept. of Science & Technology, Govt. of India. On successful experiences emerging, more units may be considered for deployment.

RESOURCE

Most prominent species growing in Tripura is *Mellocana baccifera (Muli)* that is going through a flowering phase. This is largely utilised for manufacturing incense sticks and other domestic needs such as gates, fencing, etc. However looking to the utilisation based on volume of sector no immediate threat of shortage can be seen, in spite of flowering that has yet to assume gregarious proportions.

Species other than *Muli* are more important from a value addition activity standpoint and flowering should thus be viewed as an opportunity to plant (alternative to *Muli*) reasonable numbers of alternative species such as *Dolu*, *Barak* and *Mritinga* useful to community for production needs. What has certainly been noticed is that whereas alternate species were available from nearby areas, many a times at no cost – they now had to be procured from a distance with procurement costs going up. These should thus be encouraged for plantation in civil lands close to activity clusters identified. At the same time assistance in growth and supply of *Jigat* (a sticky bark) needed for rolling of incense sticks will drive volumes in the rolling sector that has potential to be established in Tripura.

INSTITUTIONS

Two institutions have contributed to development of bamboo sector in Tripura. Both PURBASHA and BCDI in spite of a good history have however not been able to keep pace with needs of sector growth. There is thus an urgent need to position (i) a procurement and marketing organisation, and (ii) a training cum design organisation; to meet contemporary needs of the sector. This could be done through restructuring of above organisations through PPP means. The need to position such institutions with improved delivery capabilities is being re-emphasised if mission goals have to be met.

Apart than these two, other institutions will need to be established as below:

1. A Mission Steering Committee (MSC) that will oversee mission's progress and provide a supportive environment and framework for a project implementation agency to function in. The MSC is proposed to be headed by The Chief Secretary, Govt. of Tripura looking to needs to track project progress and needs of inter-departmental co-ordination. Participation of various stakeholders will be encouraged in this body to be established.
2. A Project Implementation Agency (PrIA) needs to be appointed to manage the project and deliver on agreed goals. The agency chosen must be credible and have experience of having handled cluster initiatives in the PPP format, managing infrastructure needs, raising necessary finance from government and commercial finance sources, and must enjoy confidence of Government of Tripura. They will function independently under a framework decided by MSC with necessary reporting formalities observed.

3. Institutions focused to needs of training, design, production and marketing will also need to be positioned through PrIA during the project tenure and will add to the delivery capability of the Tripura Bamboo Mission. These institutions will help address perpetuity needs of Tripura's bamboo sector once PrIA's term comes to an end. PrIA will also take the shape of a formal institution floated 6 months before expiry of term of appointed project implementation agency to effect a smooth transition.
4. Finally community mobilised SHGs linked through clusters will form the grassroots tier and drive production needs of the project through a federated manufacturing and marketing approach.

OVERALL PROJECTIONS

Sub-Sector Growth

Table below presents summary of current size of sector and as expected to be after implementation of Mission. Following points need to be borne in mind:

1. We have considered the figures for 3rd year only that itself is more than twice the current figure. Figures for earlier two years will also add to total output.
2. We need to bear in mind that figures below are purely representative on a realignment of effort basis taking into account current market indications. Upward revisions are likely once specific initiatives are focussed to address needs of market, look at exports as a market, or if a big buyer steps in to establish a production facility as explained later.
3. It is not possible to directly define the number of people involved in the sector due to lack of base data but indication has been given in the sub-sector reports with incremental employment figures mentioned in table below. This employment figure will stand committed towards the end of the three year period since establishment of production facilities would be highly dependent on private entrepreneur's involvement.
4. In particular we'd like to emphasise that once overall sector capability is upgraded it will pave the way for larger private sector investment to be deployed. This initial 3 year phase should thus be viewed as a foundation building phase for the sector.

INDICATORS / *CATEGORY*		**TURNOVER** *(Rs. Crore)*		**EMPLOYMENT**	**INVESTMENT**
		Existing	**Incremental***	**Incremental***	**Incremental***
1	**STICKS**				
	Incense	12.6	**13.11**	**2,850**	**9.25**
	Blinds		**3.6**	**100**	**1.2**
	Fine Stick Mats	0.30	**0.30**	**--**	**0.02**
	Flooring		**1.02**	**30**	**0.7**
2	**MATS**		**10.5**	**3,800**	**2.0**
3	**FURNITURE**		**3.12**	**350**	**3.0**
4	**HANDICRAFTS**				
	Utility	15.0	**15.0**	**80**	**1.0**
5	**INDUSTRIAL**				
	Gassifier		**0.50**	**10**	**0.01**
	Charcoal		**0.30**	**24**	**2.0**
6	**BAMBOO SHOOTS**		**0.50**	**75**	**0.65**
TOTAL		27.9	**47.95**	**7,319**	**19.83**

**Please refer to Annexure C for details of above chart in terms of incremental contribution.*

The following industrial houses have indicated keenness to establish units in Tripura that has not been factored in above figures as yet:

- A full fledged agarbatti manufacturing unit as has been indicated by "Cycle" brand agarbatti, Mysore

- An ancillary strip production unit to feed requirement of Kosons Industries that has a flooring unit established in Guwahati

Beyond these two units, looking to aspects of investment, resource and workforce available, units mentioned in table on the following page will find viability to be established over time given improved industrial ability and climate. These too have not been considered in workings above and will significantly increase economic output of the sector.

Industry Type	Investment	Turnover
MAT BASED BOARD MAKING UNIT	3 CRORE	8-9 CRORE
PARTICLE BOARD UNIT	2 CRORE	8-9 CRORE
BLINDS WEAVING UNIT (3 LOOMS)	0.7 CRORE	1.5 CRORE
MAT BASED MOULDING UNIT	0.7 CRORE	1.3 CRORE
BAMBOO SHOOT PROCESSING UNIT	2 CRORE	2 CRORE

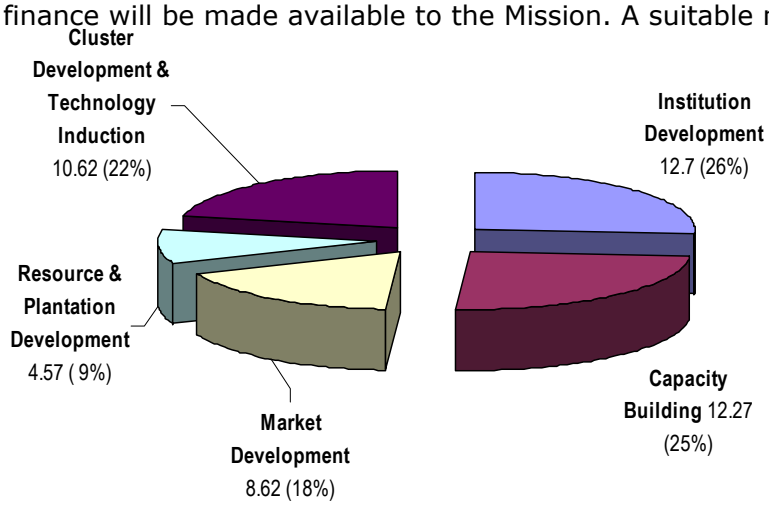
Once overall capability within the sector in terms of facilitation and linkages stand strengthened it would be easy for many more entrepreneurs to get involved with the sector. Market itself will get scaled up during the project period once it realises demands made on the production system can be met.

However we need to bear in mind that three years is too short a time to establish ground conditions, develop markets and see volume growth. TBM will thus play an important role of upgrading and strengthening the sector. This will help prepare the ground for stakeholders involved to pursue accelerated development in times to come.

Another point worthy of consideration would be the establishment of a Bamboo Industrial Zone (BIZ) where various units proposed to be set up can be brought together in one area to meet special needs. This can be seriously considered if 2-3 units are willing to establish units in Tripura around the same point of time with a provision for more units to follow. The location itself could be carved out from an existing industrial estate, Bhojangnagar for one improving upon the existent offering. Such a move will lower cost of delivery of services for production and logistics needs and will also allow the Project Implementation Agency (PrIA) to offer its package for prospective entrepreneurs in a consolidated manner. It is suggested that such discussions be initiated with TIDC and acted upon should keenness be noticed on the part of a few entrepreneurs.

Budgets

A sum of Rs. 750 lakhs has been sanctioned by Ministry of Rural Development, Govt. of India under SGSY Special Project scheme for implementing a bamboo-based livelihood project in Tripura and we are given to understand that this finance will be made available to the Mission. A suitable mechanism of utilisation and reporting will need to be formulated for effective functioning to be achieved in line with norms of MoRD.



Project Expenditure Needs (Rs. Crore)

The total project outlay emerges to be Rs. 48.78 crore. Pie chart indicates break-up of funds in terms of deployment. Further break up is covered in Annexure A.

NEXT STEPS

The immediate steps to follow have been listed. A detailed listing can be found in the section on Implementation Steps at the end of the Main Report.

1. Discussion leading to acceptance of TBM Strategy Report
2. Constitution of Mission Steering Committee
3. Appointment of Project Implementation Agency with framework based agreement
4. Allocation and procedural compliances for release of SGSY funds available
5. Informing various stakeholders involved on goals of TBM and roles expected
6. Soft launch leading to formal launch

Business Development Plan

No.	Component	Activity	Page Ref.	Responsibility	Budget	Time Frame	Expected Output
1	**Institution Development**	BCDI revamp, cluster development, marketing agency, project management	40	IL&FS, Govt., NGOs, Consultants, Enterprises	**12.7**	04/06 to 09/07	• BCDI revamped as training, design and production centre • Project management team positioned in field • SHGs and clusters developed
2	**Capacity Building**	Skill training to all involved technical & commercial, entrepreneurship development	65	IL&FS, Govt., Finance agencies, NGOs, Consultants, Entrepreneurs	**12.27**	07/06 to Project end	• Training at various levels – technical, commercial, entrepreneurial, plantation, design and production
3	**Market Development**	Promotion of TBM and related brand, market related infrastructure	16	IL&FS, DCH, Consultants, Entrepreneurs	**8.62**	06/06 to project end	• Marketing agency established • Market related storage and display infrastructure created • Promotion leading to increased sales
4	**Resource & Plantation Development**	Homestead plantations, Public land plantation around clusters, quality planting stock	32	Govt., NGOs, Entrepreneurs	**4.57**	04/06 to 07/07	• Homestead plantation in 30,000 homes • Influencing FD plans to plant species of commercial importance • Plantation in public lands around clusters
5	**Cluster Development & Technology Induction**	CFC needs, SHG formation, technology development, training, spares	57, 70	NMBA, Govt., IL&FS, DCH, Consultants	**10.62**	01/07 to Project end	• SHGs formed and cluster CFCs established • Technology sourced and established • Infrastructure developed
	TOTAL				**48.78**		

MARKETS

MARKET OPPORTUNITY

Given the versatility of bamboo, very many products can be manufactured to meet market needs since bamboo does offer tremendous potential to create products that meet discerning needs of customers. However, given the new found money and tastes of young buyers it will be a challenge to meet aspirations and a good understanding needs to be developed of products to market them successfully, particularly in highly urbanised cities. The role of design and aesthetics and contemporary look will thus need to be looked at seriously in particular if upmarket shelves are targeted to stock them. A pool of designers may be created with national and international talent. The Project Implementation Agency will do well to retain IPRs for designs created with them allowing wider usage/diffusion rather than have the same held by a designer blocking widespread usage. Apprehensions of designers may need to be addressed and a suitable arrangement may be worked out.

This potential noticed however needs to be approached with caution to avoid diffused efforts. As can be evidently seen, what has been lacking in all past efforts is development of volume momentum in product lines that have potential to meet large scale market needs. It will be important to achieve ability to produce large quantities of good consistent quality. In the past on many an occasion Purbasha and other entrepreneurs may have got large orders but could not execute them missing out on emerging opportunities ahead.

Most local entrepreneurs like to flash enquiries of big buyers, where nothing has moved in terms of delivery. This approach needs to be corrected through this project with efforts focussing on what Tripura can do best rather than continue to chase opportunities that only end up fragmenting and diffusing the sector. It will thus be purposeful to address market requirements through volume production involving number of community workers producing large numbers of quality products delivered on time.

It has become evident after this field trip and subsequent market visits undertaken that five product categories would be best suited to focus on, given project goals. This decision has been arrived at with the consensus of all study group members and is based on the fact that these products enjoy good demand, have future growth prospects and will not create large demands on the existent system. These expectations are important in initial stages of project execution given the current state of the bamboo sector.

The five product categories that emerge to have potential and have been the focus of study are:

1. Mats and derived products such as boards, coverings and claddings
2. Sticks, slats and derived products such as fine stick woven mats, incense sticks, flooring and packaged sticks as an intermediate product, utilisation left to imagination of user
3. Handicrafts of utility nature
4. Round pole furniture
5. Industrial products such as charcoal, gassifier, mouldings and at a later stage activated carbon

Of the above, incense stick manufacture, mats and handicrafts manufacture show signs be the largest employers of the sector. Industrial applications such as charcoal, activated carbon, and gassifier based power generation are proposed to be taken up as industrial activities and should be pursued for locations warranting their utilisation. This is also important to field test technologies in the Tripura context reflecting on future usability. These technologies generally improve on

viability of application once deployed on an ancillary or add-on mode. This is possible given the involvement of organisations or groups with other bamboo based production activity who by using these technologies can improve viabilities of primary activity planned.

Although not covered in detail under this project, bamboo shoot collection can generate much employment considering suitability of *Muli* species and its large scale availability based on abundant growth. To pursue this activity however, newer techniques of cultivation will need to be introduced to improve shoot yields. The effort in itself will involve collection activity spread over few months in a year and such mobilisation can be done through community groups.

Visits to markets have presented a clear picture of expectations from the bamboo sector of Tripura. To make an understatement, "there seems to be potential to absorb more intermediate material than Tripura can gear itself to supply in the short term". It is more important to understand apprehensions expressed by many large buyers on Tripura being able to deliver on promises made. While this may seem disturbing to hear, it is only indicative of their frustration from past dealings and experiences.

However, buyers seemed to be keen to collaborate in the effort if a new institutional mechanism could be put on the ground that could take a single point onus on commitment and delivery. When probed, some even indicated keenness to collaborate by setting up units in Tripura if a package could be offered to neutralise the cost disadvantage in operation and/or transportation terms. Such organisations have been listed in Annexure I with contact details.

Most units have realised the importance of resource and human need and acknowledge Tripura's eminent potential should a serious institutional solution be put in place. We see this as a high point for the Mission's effort and can confidently assume that businesses would be willing to establish facilities in Tripura should a sound business package be offered to those keen to participate.

IDENTIFIED PRODUCT AREAS

A brief assessment of product areas identified is presented below. Detailed coverage has been done in the sub-sector reports submitted separately. Figures mentioned indicate information based on market feedback without assumption of export potential. It also indicates current preferences and choices of distribution that may all change if a big buyer decides to take a position in the sector. Incidentally, IKEA is exploring such an option and if interest is sustained, the scale of investment would end up being much higher. However, given the current scenario such large scale efforts should only be initiated after general upgradation of production and business skills within the sector have been taken up to meet needs of national markets.

MATS

Mats are a useful intermediate product made at the primary processing stage and find large scale utilisation for production of mat board, shuttering board and roofing sheets. A unit in Arunachal Pradesh is also producing pre-fab houses using such boards largely targeting the disaster management sector. While there seems to be imminent demand for such mats, the input supply end seems to be weak in meeting market needs. Opportunity for setting up an organised intermediate industry for mats and slivers exists but it has yet not been realised due to lack of facilitating mechanisms between demand and supply.

Other than being an intermediary product for board manufacture as indicated above, mats can be used as a floor covering or wall cladding for partitions or to meet aesthetic needs. This segment of the market will however need to be addressed once facilities have been established to meet scaled up needs of board units. This will make them competitive in pricing given the low demand pickup initially while introducing them in the market. However what needs to be borne in mind is the fact that being a decorative item variance in design will be required to get over consumer boredom or fatigue factor. Many a times in the past, interior designers interviewed have indicated that they can't utilise the material extensively given shifting consumer preferences for something new. This includes changing the weave pattern that does produce a different product but looks largely the same.

This end of the market will thus be constrained by variety of look, whether as a stand alone mat or through the form of boards. If it is to be used for inside layers covered by veneer or impregnated paper it might end up being high on costs considering open flattened bamboo is a much cheaper option. Recent trials using bamboo dust and shavings to give an external finish to boards too will drop the market over a time period since this kind of an exterior would enable all kinds of finishes such as polishes and paints to be applied to it, something that mat boards do not permit.

Mats would better serve the need for industrial and institutional products like shuttering board, prefab houses, and BMCS more than decorative board. However in the large furniture industry there would be no dearth of buyers even for decorative mat board as long as new varieties and shades can be made available to the market, as has been experienced by rubber wood.

Units involved with manufacturing bamboo mat board, bamboo mat corrugated sheets, and prefab houses have been set up in the last 3 years in different states of NER and West Bengal. However looking to market needs it would seem evident that the market for such a product line and consequentially mats would be limited over time. What can drive demand are applications of mat based boards to meet social needs in disaster mitigation and this will need to be driven by government for social needs such as housing through policy initiatives.

However, units established have indicated a combined requirement to the tune of 6-7 truckloads of mats per day. Each truckload has 2,500 mats. This would translate into involvement for 1,200 weavers per day for one truckload assuming 2 mats can be woven in a day. If 6 truckloads are assumed as contracted, we are already looking at an opportunity of providing employment to 7,200 people daily assuming one person currently weaves 2 mats per day on manual basis. Figures will change once automation comes in.

Units established to manufacture mat based products are:

Unit	Product Range
AB Composites*	Bamboo mat corrugated sheets
Embee Forest Products^	Flooring, door frames, shuttering board
Kitply	Bamboo decorative mat board, shuttering board
APIL	Prefab houses, boards, pallets
Timpack	Bamboo mat corrugated sheets
Meghalaya Ply Board	Mat board
Zonun Matply Pvt. Ltd.	Mat board

** AB Composites utilises jute as a composite material with bamboo*
^ Embee Forest Products uses wood with bamboo in its products

Market: Mat as End Product

The market opportunity for mat boards seems good at the current point of time given needs of the furniture industry that is growing at a rate of growth matching the GDP. BMCS and pre-fab houses are finding opportunity in the disaster rehabilitation market with orders flowing in from tsunami and earthquake affected areas largely driven by government's rehabilitation needs.

Apart from direct application as a decorative board, bamboo mat board is also being used for making pallets for packing tea. It may also have potential to be used as a shuttering material or for strength based packaging needs.

Bamboo Mat Board has been awarded an ISI code now and this has increased its market acceptability particularly for disaster rehabilitation applications. Kitply, a one time market leader is looking to utilisation of bamboo by introducing new product ranges. Having a large player involved bodes well for the sector.

Manufacturing units have overcome process teething problems and are prepared to go in for full fledged production. They have made many forays into the community to source mats but none of them have come up with a sustainable solution. Many even stated that they had spent extensive time in Tripura but to no avail. At present they are making do with in house sourcing and production in some cases by either making own mats and strips employing mat weavers, or sourcing through traders. This is not sufficient – shortage of woven mats is the biggest barrier to growth of the mat board industry and presents itself as an opportunity should cost and quality needs be met.

Past efforts on the part of these manufacturers have not resulted in delivery of required quantities on time by local communities. Any new supply based arrangement needs to take cognizance of past failures and suggest a contracting system with penalties, to improve commitment on both sides. Industry owners have indicated on many an occasion that suppliers have failed to deliver on their promises to the market and if they do not soon get a steady supply of mats, it could threaten their operations. This will obviously reflect poorly on the so called huge potential identified for the bamboo sector with evident capitalised investment.

Price of Mats

The landed cost of mats as expressed by industry owners was mentioned to be in a range of Rs. 42 – Rs. 62 per mat on landed delivery basis in Assam and West Bengal. We are assuming a price of Rs. 45 for Byrnihat (Meghalaya) delivery as a price point to match.

Each mat uses one culm of bamboo costing Rs 10 in the open market which is high. This can be supplied to weavers at lower rates once contracted for volumes.

Three things thereafter need to be considered: (i) Rs. 5-10/mat would need to be spent towards carrying costs out of Tripura, (ii) Rs. 5/mat would be collection, storage and handling costs approx., and (iii) Cost of delivered mat is to be assumed at Rs. 45/- each. Worked backward the artisan can not get more than Rs. 30-35 in the best of situations. If another collector is introduced in the supply chain, margins will be further cut. It would be reasonable to assume that weavers would expect Rs. 90-100 for weaving mats as part of a day's work on a contracted basis, after paying for raw material with collection of mats being done from their doorstep. This points to weaving at least 3 mats a day in a 8 hour period.

Technology Options

The case for mat making as a sustainable livelihood proposition is possible only if community is able to weave at least 3 mats per day for which they can earn Rs 30/- per mat. To meet this goal, an aspect considered was that of supply of

slivers through a CFC based arrangement taking care of two important aspects at the same time, (i) consistency of quality, and (ii) availability of raw material. However it calls for an investment of Rs. 25 lakhs+ for equipment alone to establish such a CFC making it unviable to pursue. In a non mechanised mode making slivers by hand 2 mats can be made in a day by one person. However, in a mechanised mode using slivers made with machines, up to 4 mats could be woven comfortably in a day. However indications are that mechanisation costs do not justify investment and may not be the way to go given overall economics.

Also to be considered is the fact that that unless 150-200 workers can get together to work from a location to utilise capacities installed it may not be viable to justify this investment towards large scale mechanised operations. Mat weaving of course would be done manually.

It may thus be a better option to run a collection based mechanism on manual production basis focusing on improving quality from a process perspective. Considering the number of poles to be worked on at a given point of time, it is quite feasible to use a hacksaw and *Dhao* for carrying out these operations as being done currently. Quality of tools used including tips and sharpening mechanisms could be focused on though. The first step to mechanisation could be the installation of a ERG type manual slicer or the electrically run Slicing Machine costing Rs. 45,000 that can deliver 10-12 slices a minute. An overall viable cost set for this would be Rs. 1.5 lakh given the need for 1 Slicing and 2 Slivering machines to reduce thickness to desired level. Such smaller feeder units could be established closer to points of weaving clusters allowing improved chances of viability and usage. However they presume availability of electricity for a sufficient duration of time.

Mat specifications have been laid down by the industry and these are not too stringent considering that weavers are well versed with such weaving practices. While many weavers indicated that buyers randomly rejected goods on grounds of quality, we feel it has largely emerged on lack of understanding of needs by weavers. Manufacturers sourcing through traders indicated that they had cut down on rejection rate drastically given trader's understanding of requirements over time. The opportunity for mat clusters exist, however timely supplies are critical with transportation cost aspect needing to be addressed. Also needing to be addressed is the factor of building trust to fuel contracting arrangements.

However, many buyers of such mats have remarked that food security steps initiated within the state had an impact on entrepreneurship as the community was not interested in weaving more than one mat per day and expected a price of Rs 35-40 for the same. If this holds true it will need to be addressed seriously if plans of scaling up production are to be drawn for any product category.

New Mat Making Technologies Being Tested

One also needs to take cognisance of newer options emerging that will help with automated mat weaving. Newer machines developed in China can address needs of mat weaving and one unit in South India is being established with support from NMBA. The total cost of machineries is Rs. 25 lakh and it can produce 100 mats/day on a 2 shift basis. Such an investment is only possible where cost of mats are in excess of Rs. 100 each. There seems to be an option possible where the key machines such as slivering and mat weaving (both imported) can be fed through a manual production system before the final process to produce same amount of mats.

If trials being conducted by NMBA are favourable an investment of Rs. 20 lakh could be employed towards procuring a 3 loom set that will deliver 300 mats on daily single shift basis. This would be a better system advocated for Tripura allowing extended human involvement in the process as long as market needs are met.

STRIPS, SLATS & STICKS

Strips can be utilised in many forms and lend themselves to needs of the market starting from incense sticks to more sophisticated requirements for bamboo flooring and wall panels in strip form. Of late there seems to be a good demand for Venetian Blinds. These blinds are currently manufactured on a manual and mechanised basis with imported looms from Taiwan having been procured by at least two units. While manual manufacturers may like to generate their own hand made strips, the mechanised units definitely need to procure mechanised strips of good quality to feed their units.

Other than such organised efforts, possibilities exist for production of strips in standardised sizes, eg. 4' x ½", 3' x ½" or other such sizes. These would need to be well finished, treated and packed into bundles of 100 or 200 that can then find their way into big cities or other locations where users can have access to the material to use in any manner they want. Architects and interior designers other than furniture manufacturers would definitely find use for such material other than unorganised sector who can utilise it for many innovative purposes.

Agarbatti Sticks

Estimates gathered initially pointed to a demand of 45,000 MT of sticks per annum. However on studying information from sources we have arrived at a figure of approximately 17,000 MT p.a. based on the following information.

Purbasha has quoted a figure of 12,800 MT a year. Trade sources have indicated a figure of 200 trucks of 9-10 tons per month which translates to 21,600 tonnes a year. Taking the average of two sources, we can estimate the outgo of agarbatti sticks from Tripura to be 15-17,000 tons annually. This figure stands validated after discussions with buyers in Bangalore who have corroborated estimates assumed by us. Discussions with Forest Dept. based on figures available at the check post have put the figure to be 1,500 trucks coming to roughly 13,500 MT per annum.

Agarbatti units in Tripura have experimented with value addition through stick rolling, however, they are not clear about the manufacturing process and lack packing and perfuming expertise. Unknown to them also is the cost and expertise that goes with managing a branded product. This step of taking a higher value addition position in agarbatti manufacturing will help Tripura improve its prospects in the sector. Currently Rs. 2,000 crore is indicated as the total value of the sector in which despite having nearly 65% share of stick raw material it has a share of only Rs. 12.6 crore on revenue basis (6.3%).

A case for agarbatti manufacturers to set up value added manufacturing facilities in Tripura given the cartel based hold of Bangalore and Mysore based agarbatti manufacturers seemed low to begin with. Though transportation cost was emerging as a negligible input considering 1 kg. of sticks contains 4,000-5,000 sticks and costs Rs. 5/- to transport to Bangalore. Given this cost it was natural to begin by assuming that there was no real advantage being offered by establishing manufacturing facilities in Tripura. However, opportunities seem to be opening up to establish a rolling unit in Tripura on another count. After visiting Bangalore and Mysore markets it has emerged that labour in Karnataka are being weaned away from rolling activity to more lucrative sectors such as garment trade. This is turning the tide in favour of encouraging complete manufacture of agarbatti sticks in Tripura with interest being shown by some manufacturers.

Given the fact and size of Tripura's market share in the trade (nearly 80% of non-premium sector) it is a matter of concern that a meagre return of Rs. 25/30 per day results for those involved. One reason for this is also the casual approach taken towards work to fill time available with primary responsibility being another activity, either income bearing or otherwise.

It may be worthwhile to pursue collaborative efforts on lines done by Jayanti Domestic Group with support from ITC or as indicated by the Cycle group to encourage higher scale production with commitment of procurement. At the same time, higher value addition realisation from activity such as basic rolling should be established. Visits to organisations in Bangalore and Mysore have indicated their desire to establish manufacturing facilities at Tripura assuming support is forthcoming from the government and have been detailed under Annexure I.

Strategy Suggested

1. Develop a package that encourages establishment of operations for at least two incense stick manufacturers
2. Establish facilities for partial mechanisation for stick making to meet output needs in terms of volumes and quality
3. Optimise sector's output by undertaking grading and sorting operations in Tripura itself helping raise value derived
4. Develop initiatives helping establish agarbatti stick rolling units in cottage sector by building awareness and capacity.

Bamboo Flooring

Bamboo flooring is a preferred form of natural flooring as compared to wood looking laminates that have flooded the market. The laminate base flooring is not water resistant, its shine wears off and needs to be replaced within a year as it is not able to bear a higher customer traffic. With qualities that can address these areas of current discontentment, bamboo flooring offers potential to gain entry into this high growth flooring market.

The flooring market in India is at a stage of rapid growth. This is largely due to the growth of the construction sector where all sub sectors such as residential, commercial offices, retail showrooms, malls, hotels and resorts are growing rapidly.

Time being a critical factor there is a rush to complete projects and get a competitive edge over other property developments to attract better tenants at higher rentals. High investment retail outlets and malls are expediting construction operations to attract consumer footfalls as early as possible.

A fall out of this rush is the search for new construction material that is durable and appealing, one that not only saves installation time but is also cost effective. Bamboo flooring offers exactly the above benefits which are being sought by the organised retail sector construction companies. It is quick to install, durable and can withstand high traffic. Its natural texture gives it a different look and it will be cost effective in the long run as it needs less maintenance. Most builders are keen to project a "different" look to the construction being undertaken be it a building, office or retail outlet.

This represents the higher end of the strip based application. There are two flooring units that have been successfully established in the eastern region and are running at 20-40% capacity at present. These are large units with an investment upwards of Rs. 3 Crore in plant and machinery.

The units have a requirement of strips of a specific size and thickness, and viability of these units is based on receiving these strips from primary processing units serving as hubs. Encouraging entrepreneurs to set up such primary processing hubs have not yielded results yet, since there is fear of dependence on the fate of flooring units that themselves need to stabilise. These units have therefore been compelled to manufacture strips through internal efforts to build confidence. Some entrepreneurs are now showing interest in setting up such primary processing clusters. A very important factor is supply of consistent bamboo slats of uniform age and finish achievable only through a planned plantation route. As market matures, there will be a demand for such higher grade material to be achieved through dedicated plantation efforts.

Marketing of bamboo flooring tiles does not seem to be a problem considering there are two units involved with its manufacture and there is reasonable demand noticed from architects and builders given the growth of commercial building space. The situation may change as more manufacturers step in.

Bamboo Blinds

Two units located at Guwahati (Vighnaraj Blinds and Rhino) are currently in the process of setting up automated looms imported from Taiwan for weaving blinds as running material from sticks. Vighnaraj Blinds is a small unit with an investment of Rs 15-18 lakhs funded by NMBA. At 50% capacity and working for 24 days a month the unit can produce 66 blinds of 3ft x 6 ft per day. This production of roughly 1,000 sq. ft./day is likely to be priced at Rs. 52-75/sq. ft. in the market. They have trial orders from dealers in metro cities and is looking to do good business based on enquiries.

Rhino is a fully mechanised unit having 7 large capacity looms capable of producing 3,200 sq. ft. of woven blinds at 80% capacity utilisation. Combined requirement for sticks for both these units would be substantial to ensure steady supply, not to mention new units likely to be established. It needs to be borne in mind that such units will use mechanised blinds only looking to quality needs.

Opportunity for Involvement

Sticks would find utilisation as an industrial application in the Venetian blind industry manufactured through mechanised or manual means. Once such woven material is available on running length basis they would even lend themselves to applications other than window blinds expanding the market.

Sourcing of sticks for the two units is currently being done by traders who procure them from a CFC at Guwahati or from Meghalaya. This line of supply is being seen as a major bottleneck by both units. They are on lookout for tie ups with reliable stick suppliers who can supply machine made sticks on a regular basis.

As and when contracts are made with these units they would need to be done on secure contracting basis as these units too are a new breed of entrepreneurs, not yet well versed with risks involved. They may come under pressure to make payments to the community supplier if they are dealing with them at an individual level, as has been even been reported. A cluster entity would have a better hold and bargaining power with such entrepreneurs and should be encouraged as a counterparty.

There is also a likelihood of more Venetian blind units jumping into the fray. The market is currently large and would easily absorb new products and designs on offer. Investment for this industry being moderate we can easily expect more units to be established in the near to medium term. This will strengthen the case for demand of sticks. On the other hand this is a typical product where threat of imported products flooding the market has to be borne in mind. However local needs can be understood better by a local manufacturer and ensuring "smart manufacturing" measures can help counter threat if high production volumes can be achieved. For any such instances it would be better if the home production sector stretches itself to compete rather than resorting to tariff measures at an early stage that would only weaken the capabilities of the sector.

Large as well as small Venetian blind units have the potential to be set up in Tripura considering low investment and raw material availability. However, transport costs will need to be studied in detail to justify viability. Buyers like Fab India, Contemporary Arts & Crafts, and other home furnishing showrooms can be linked through a PrIA led institutional interface.

Entrepreneurs may be encouraged to establish mechanised blind weaving units in Tripura. With a relatively lower investment and availability of raw material this unit seems viable to be established by an entrepreneur.

HANDICRAFTS

Handicraft SHGs are most prevalent though widely distributed and have the necessary skill to make quality products. However, they have mentioned lack of finishing machines available to them on one hand and new designs on the other as areas that need to be addressed. They have also not been able to establish linkages with markets and most rely on Purbasha, or the occasional fair to connect to the market.

Market opportunity exists by providing artisans with designs that are guided by market needs and that take into consideration the learning curve and feasibility of scaling up in skill, technology, and investment terms. Establishment of machineries to produce better finished products, integrating with improved design, and providing artisans with a platform where products can be marketed would be three very important needs to be addressed on an urgent basis. However, considering aspects of capacity utilisation they will necessarily need to be supported through a CFC distributing the investment burden on to a usage based system of recovery.

Close interaction with buyers and designers will need to be established to address needs of market. While the "Olom" experience has left a bitter-sweet taste for Tripura, a serious and involved effort should see this sub-sector succeed in the market.

The barrier also exists in terms of the mindset of artisans towards work. Feedback suggests that on several occasions, handicraft workers in Tripura have been unable to fulfil their commitments due to unwillingness of artisans to work. This aspect has to be considered at the time of setting up handicraft clusters leading to a mechanised approach to meet commitments of the market. Once again the effort will need to take an all encompassing approach, else

establishment of hardware and infrastructure will turn out to be an easy task with utilisation posing a problem.

Strategy Suggested

Buyers for handicrafts in the interiors conscious markets of Mumbai & Bangalore have indicated a very contemporary preference for items to be supplied. With imports liberalised, many stores have only synthetic materials to offer. Thai, Chinese and Vietnamese products have already started to make their presence felt on shelves of stores. Instead of large metros, mini-metros may be a better market to approach. However, the confluence between designer and material to produce an appealing product can change all equations but these will need to be prototyped, test marketed and then launched.

As indicated by a leading designer who has worked extensively on the "Olom" project in Tripura and has a good understanding of markets, utility handicrafts with good market potential are:

- Planter Coverings
- Wastebaskets/Laundry Baskets
- Clothes Hangers
- Bowls
- Magazine Racks
- Screens
- Complimentary Gifts

These utility items would have a demand amongst those starting out in life, or those who would not like to invest in heavy furniture being difficult to ship during early working life movements. An eco-friendly label could achieve much for the sector and past initiatives of Tripura under the "Olom" brand need to be capitalised and built upon. The handicraft sector can be seen as a future export potential for Tripura with substantial value addition being done within the state. However, an organised production system able to deliver on counts of volume and quality will first need to be positioned before lofty export oriented goals can be addressed.

ROUND POLE FURNITURE

It was heartening to note that some units in Tripura have started to manufacture round pole furniture in a knockdown state. Looking to transportation costs this would be necessary to make furniture competitive. Products viewed during visit to production units showed evidence that they needed better finishing machines, designs and market tie ups for their products. There exists an opportunity for this kind of light, easy to handle and durable furniture in newly set up transferable homes, for outdoor needs as well as in the hotel and restaurant segments. However markets in larger cities are indicating a preference for contemporary designs and this will need to be borne in mind to be competitive and find a niche.

Strategy Suggested

METRO MARKETS

The strategy for metros will be to target large furniture stores and organised furniture chains like @Home.

On the basis of market visit to Mumbai, for bamboo pole furniture to gain a small foothold in the current retail furniture market in Mumbai it is the boutique style furniture stores (as against the very large –Tangent, Living Room variety) that can be targeted. These are the stores that dictate the trend in the market place. Furniture distributors for pole furniture can be appointed for the city and it will be through acceptance in these second tier showrooms that market growth can be

fuelled. They can be convinced to stock bamboo pole furniture as it might be able to provide them with just the much needed differentiation v/s their competitors and also add to variety which consumers seek.

Opportunity for bamboo pole furniture can emerge in the regular furniture market through targeted selection of products and stores. The strategy would be to target larger stores through a distributor who knows the market and is willing to start with a new line.

The strategy will also include convincing larger stores to stock few products on a consignment basis made with value proposition being "Bamboo Pole furniture is a break from typical fare, is longer lasting and yet sports a trendy international look, not a typical Indian look or a monotonous international look that is found across the entire market place."

Market awareness needs to be generated through effective concept selling. Visibility through high profile stores catering to masses and classes is needed along with education about bamboo the material. Even for this approach however, the look of furniture has to be changed to match the contemporary look exuded by glass and steel being preferred in new Indian homes.

NON-METRO MARKETS

An untapped market also exists in non metros that are getting urbanised rapidly. We can consider cities with million plus population to be a potential target for bamboo pole furniture products.

In smaller non-metros, the influence of imported furniture designs may not have penetrated as deeply into the psyche of consumers as in larger metros, where it is more a case of supply creating its own demand. The taste of smaller city consumers would tend to be more ethnic and Indian. In addition, they are likely to have a higher consideration for durability and not be of the "Use and Throw" variety to which younger generation in metros may be inclined. Bamboo pole furniture with its ethnic yet trendy look and durability offered as against wood and other material furniture might just be successful in opening up a new set of consumers in the smaller cities, currently buying plastic moulded, wrought iron or local wood furniture.

The strategy followed would again be similar to that of larger cities – appointing local distributors on a state level who can supply to multiple cities within a state. Apart from distributors, penetration into non-metros can also take place through organised furniture chains as they expand into smaller cities in next 3 years.

Overall Strategy

A range of products comprising fast selling items should be made available to give consumers variety to choose from and provide confidence about the product to distributors and retailers. It is suggested that furniture for drawing and dining room and children's room can targeted. Middle class homes influenced by media explosion in their drawing rooms are emulating the lifestyle depicted in the soaps – they take pride in a new looking drawing room and also having separate children's cots is a matter of pride for them.

Promotion efforts directed at interior designers through road shows and one-to-one meetings, and participation in interiors fairs such as Society, Inside Outside will not only serve as an appropriate positioning platform but will help promote the new look promised. At the same time such efforts will serve as an important means to get feedback and assess demand.

Bamboo pole furniture would have to be priced aggressively as against the current range of furniture available in the market. Different designs at different price points covering the range as suggested above can be introduced for creating high visibility and for variety. It can open the market for aspirational middle

income and lower middle income groups in a similar way as moulded furniture did 20 years ago.

Furniture would also score high on the durability aspect yet have a different look – since after a point of time all imported furniture has almost the same monotonous look. In case of the metro market, once the desire of imported goods is satiated, bamboo furniture would find higher acceptance given its aspects of durability.

In order to make a pitch for the product, distributors in different cities and furniture chains such as @Home will need to be got on board. However the following will need to be positioned:

1. Different designs of drawing room set and children's room sets would have to be created to provide variety.
2. Training Tripura workers to translate the design into finished furniture.
3. Manufacturers and those involved with selling will need to understand systems to be followed for order placement, contracts, delivery and execution.
4. Warehousing and inventory practices to be observed to have reduced carrying costs yet not missing opportunities of sale.

INDUSTRIAL PRODUCTS

These industrial products are important to address future needs of Tripura. Though large numbers may not emerge as demand at the current stage, it is nevertheless important to establish few units not only to meet current day needs but also pave the way to the future by introducing the system of production to Tripura entrepreneurs.

CHARCOAL: Considering the low investment of Rs. 10,000 required to establish such manufacturing facilities on community basis, many such units can be established. The new technology now even allows bamboo upto 3 mtrs to be charged for production of charcoal, generating a yield of 200 kgs/day over a 3 day cycle. Given the low scale of capital investment and large scale availability of bamboo the unit presents a low breakeven point since the charcoal can sell for Rs. 6-7 per kg. A scaled up unit could have 5 kilns that will yield 1 MT of charcoal per day. Most bamboo species can be used pointing to versatility of the process though bamboos with higher biomass as an input will give more cost efficient results.

Given 80% operational efficiency over 300 days, 240 MT can be produced from each such unit. Indications are that at least 1,500-2,000 MT of Agarbattis have potential to be rolled in Tripura to be taken up as part of the scaled up effort to grow the incense stick sector within the state. This need itself would point to 6-8 such units being established considering the equivalent amount of charcoal required by weight to bamboo sticks used. However establishment of such units will need to be established once agarbatti units proposed to be established go into production.

These units will need to be positioned close to such agarbatti rolling facilities and will need to have a contracted arrangement to supply to such rolling units. This will largely be with a view to address aspects of avoiding over-capacity in

charcoal production given its low cost of entry. By tying up units on dedicated basis, production and usage can be planned.

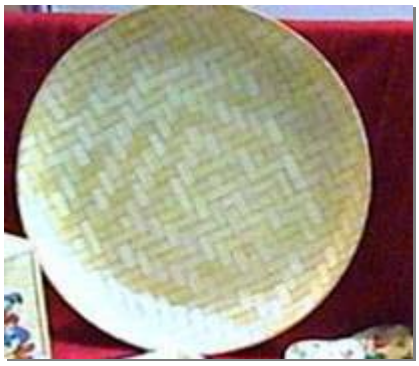
GASSIFIER: Initial installations of gassifiers at Tripura and other locations have been based on dual charge basis with diesel being one fuel option. Given recent escalation of diesel prices viability of such units has come under a cloud casting doubts on the technology as a whole.

NMBA in collaboration with Indian Institute of Science, Bangalore has developed a bamboo based gassifier that draws its charge from bamboo. Discussions with TREDA in Agartala have indicated their keenness to pursue such facilities in Tripura. Looking to proposed growth of bamboo sector leading to establishment of various manufacturing facilities within Tripura such gassifiers will prove viable since bamboo feed (otherwise being assumed @ Re. 1/kg. as biomass) will be available to such units as a waste by-product. As an example, each stick making unit set up produces 1 MT stick from 4-5 MT of bamboo, rest being waste. Balance waste can be used as biomass feed for such a unit of a capacity of 50 kW. Currently power procurement for a gassifier (non-bamboo) unit in Tripura is being done at Rs. 2.75 per unit. Assuming this as an initial cost of electrical unit, the bamboo based gassifier would prove viable and looking to bamboo based production units being established, 5-6 such gassifiers can be safely installed with varying capacities dependent on availability of biomass and needs of unit.

Establishment of such bamboo biomass based gassifier facilities on a community managed basis may also be considered. Inclusion under the PURA program of the government or even on an independent basis may find viability as carried out in West Bengal, where community managed units are doing well with user charges being paid for electricity drawn. The key to such arrangements would be to have the community fully involved, trained, equipped and empowered to address their needs with requisite technical support given by a technical body such as NMBA.

Another suggestion from the field has been that viability of such units could be further improved if utilisation of biogas can be introduced to the system. This is a pointer to possible research being pursued by a national technical institution such as IISc-NMBA. Though Tripura doesn't have a high incidence of livestock, should such a growth path be followed (and there seems to be an apparent need for livestock development if issues such as fodder can be addressed) it may add to the viability of gassifier operations once technical issues stand addressed.

MAT-BASED MOULDED PRODUCTS: One of the applications of mats is manufacture of boards that calls for a high investment. Though attempts are being made to establish such a unit in Tripura there is potential to establish another product, acrylic covered moulding sheets at a lower investment that can produce products to meet market needs. These sheets can be used directly or can even be cut and pressed into various shapes yielding products such as trays, bowls, and other presentation items. We see potential for establishment of such a unit that calls for an investment of Rs. 55 lakhs and will yield 200 sheets/day of 3' x 4' size if investor comfort can be established. These sheets can then be pressed to mould different products at the same unit or at other units. Once such a facility has been established mat weavers produce will find another avenue for utilisation for woven mats. Considering mat weaving ability of the state it may be worthwhile for an entrepreneur to establish a mat moulding facility in the state. This needs a capital outlay of Rs. 70 lakh.



OTHER NEW APPLICATIONS

Other uses such as deriving Ethanol from bamboo can be explored if technology has been stabilised. One group from USA has shared details of a technology that can derive 78 gallons of ethanol from 1 MT of dry bamboo. The investment for such a unit would be to the tune of Rs. __ lakh and could be looked at if technology has been stabilised and is running at locations over a period of time.

Another technology that will definitely have a huge potential in Tripura will be establishing a unit to manufacture sanitary napkins from bamboo fibre. This information was shared by NMBA during the last stage of report writing and holds great promise considering that a unit with a capital outlay of Rs. 8 lakh can produce 15,000 napkins a month at Re. 0.60 each. Local markets and hospitals could be looked at from a marketing perspective though sensitivities of usage in the rural context will need to be addressed. Communication through personal contact will drive efforts to introduce the shift in usage habits but the prospect of such a product seems very promising at this point of time.

BAMBOO SHOOTS

The abundance of availability of bamboo in the state is a good reason to pursue this line of activity given the new found fondness of the Indian consumer palate. The effort can be easily scaled up considering it is already being conducted in an informal manner in Tripura. Establishment of an effective collection mechanism from the field and linking to storage and bulk packaging facility can open up market opportunities. To add value, what will be required will be establishment of processing facilities, available in varied scales as detailed below.

To begin, a small scale production facility may be established that calls for an investment of Rs. 35,000 towards equipment that can function from a room at a home location. This system of production will deploy basic cleaning, cutting/chopping and packaging facility capable of bulk packaging. These bulk packs can be shipped out to food processing units in other parts of the country through a consolidator's intervention. Assuming a margin of Rs. 5-6/kg. that can be achieved through this route the unit has the ability to be viable at a low scale.

The second production mechanism could be a scaled up facility capable of processing 40 MT of shoots given the 90 day shoot harvesting season where processing of other fruits would help justify a larger investment. This unit will be more capital intensive at Rs. 7-8 lakhs investment and is advisable to be pursued after a while. Payback for investment can be achieved in a period of approximately 3 years. A bamboo shoot processing unit is already operational in Agartala selling products under the brand name "Paras" in which NERAMAC is also involved through its distribution efforts.

In any case it makes eminent sense to establish a formalised collection system if only to feed the existent unit at Agartala to begin with. This would call for storage and a networked system of procurement at the community level connected to a manufacturer. There is also potential for a local distributor to emerge to collect and distribute within Tripura, sell to unit established at Agartala, or even ship to other buyers outside Tripura. These could be large scale consumers like hotels, canteen kitchens or even processed food manufacturers. Once the aggregating process has been structured, discussions may be initiated with potential buyers in metros agreeing to supply primary processed shoots in bulk packs.

MARKET EXPANSION TRIGGERS

- IIT Guwahati Industrial Design department has invested time and resource in providing technical know how to manufacture bamboo blinds to Vighnaraj blinds and Rhino and are working with various entrepreneurs in Assam to support them from design perspective.

- The National Institute of Design (NID) has done good work in the past but has not been able to develop a evolving plan that to raise capitalisation in the sector. Positive fallout though has been adaptation of design and manufacturing principles even by those not advised. Involvement of NID may be considered with a larger role through BCDI for one with clear expectations set.
- Bangalore based agarbatti manufacturers are keen to establish facilities in Tripura and should be encouraged in a manner that maximum value addition accrues within the state. This will also encourage set up of charcoal manufacturing facilities.
- Mat based board manufacturers have indicated a demand for mats far beyond what Tripura can address. Since Tripura is best suited to produce these mats this can be a great opportunity.
- Another sector that seems to be on the rise would be the Venetian blinds sector achieved through mechanised looms. Sticks for these units would be required in large numbers.
- Bamboo shoots offer an opportunity that needs to be studied from access, species and harvesting perspective but can take shape of an activity to be pursued.
- Architects and interior designers are enthusiastic about bamboo boards as a rustic construction material, though for limited usage over time. Flattened bamboo boards are being used for making walls. These new applications would find a good use in the decorative furniture market. This target group may also be tapped for blind and screen applications.
- Opportunity exists to set up small primary processing units as well as units for strip making and particle board making. Entrepreneurs have expressed their interest in setting up these units in Tripura, provided an interface such as PrIA is available to them as the Tripura based counterparty.
- Bamboo lends itself to setting up of integrated intermediate products units – slats, strips, particle board and bamboo dust for mosquito coils. Clusters integrated with these units can balance their risk and address different market segments.
- For remote locations bamboo based gassifiers can address needs but have to bear in mind past experiences and be studied against other alternatives in terms of renewable option or biomass used.
- Possibility of entrepreneurs to establish small scale manufacturing facilities can be pursued in areas of moulded products, shoots manufacture, charcoal, furniture and utility handicarafts. This will however depend on primary support positioned to enable their entry.

MARKET EXPANSION BARRIERS

- Taxation norms of subjecting goods passing through Assam to TP and VAT (12.5%) increases the freight cost and makes landed cost of products manufactured in the NER unviable – this requires to be addressed through policy level efforts.
- Transportation costs will eventually prove to be the single most important component pricing Tripura products out of market's reach. While policy initiatives have positioned a subsidy based arrangement the fact is that it is not practical for entrepreneurs to tap this given the delay experienced. A more innovative method will need to be thought if industrialisation of Tripura is to be pursued. A subsidy arrangement for air cargo may be extended to other products rather than export oriented products only. Perishables such as bamboo shoots for one would definitely need this support. As a case, if 10 trucks/day need to move over 200 days/year and Rs. 20,000 is the fare to Siliguri, a sinking fund of Rs. 4 crore could provide

the required support by extending an innovative form of subsidy to re-establish competitiveness to Tripura's manufacturing sector. PrIA could manage such a fund and be responsible for collecting the subsidy given by Govt. on rolling basis. Finances will however need to be allocated to manage such a Transportation Fund.

- Monsoon lasts for 6-7 months a year during which transportation becomes a bottleneck. Opening up the railhead would definitely help transportation. Though the railway line was to reach Agartala by 2007 the rate of progress is slow and deadline not likely to be met. Time taken to transport being 15-20 days, smaller units in clusters may not be viable if treatment of intermediate products is required using treatment plants managed at the factory end. For certain lines of production moisture content is critical and farther the basic processing unit more difficult the task. Alternatively, suitable storage and treatment sites need to be created through low investment near/in cluster locations.
- Opening up of trade with Bangladesh can mean a lot to Tripura's economy. Realising the political implication of this decision the study team has not pursued possibilities in detail but well know the massive opportunity that exists if borders are opened. Value addition possibility across the border with delivery on Kolkata side may also offer viability if reasonable margins and duties are applicable for transit through Bangladesh. CII is known to be working on this aspect through its office at Agartala. One way out could be if international buyers located at Bangladesh serve as a catalyst to procure products through the land route.

RESOURCE

BAMBOO RESOURCE

Looking to the luxurious growth of bamboo in the region one may wonder why the subject merits discussion. However, a closer understanding of needs and situation helps make this point clear.

Given the overall position of bamboo growth within the state there seems to be no problem in matching demand-supply figures. However, things start to change when we take into consideration needs of different species for different tasks given their properties. The dominant species *Muli* is largely put used by incense stick manufacturers other than for its applicability to items of domestic utility such as gates, fencing, etc. Species used for value addition activities such as handicrafts, furniture making, mat and stick making as also their derivatives use *Mritinga*, *Paura,* , *Dolu* and *Barak*. Not only are these species restricted in their distribution as compared to *Muli*, but their occurance is often not matched with requirement. Thus a group of artisans who use *Mritinga* for handicrafts that they make might find a local paucity of this species and a need to procure it from a distance. This adds to the cost of raw material and can severely cut down the profitability making it unviable to continue this operation. Thus over time plantation activity should be carried out around clusters for which common lands may be utilised.

Another point to consider is the likely current impact of bamboo flowering of *Melocanna baccifera (Muli)* species, most prevalent in Tripura to the tune of 80% approximately. However while this would normally have had an impact on production needs of incense stick manufacturers no such situation has been noticed currently.

IMPACT OF FLOWERING

The impact of flowering of Melocanna baccifera (*Muli*) has as yet not been felt as only a small amount has flowered. Once flowering peaks over next few years, and bamboo stands start to wither on a large scale, its impact especially on incense stick manufacturers will need to be considered. A mitigating factor is that a relatively small amount of *Muli* forest – about 10% of the current forest – is required to meet the demands of agarbatti stick manufacturers. At present, the requirement of *Muli* is no more than 7.5 million poles per year which can be produced in a sustainable manner from around 35,000 ha of forest. Staggered flowering and the ability to use a few other species of bamboo for agarbatti sticks will buffer the impact of *Muli* flowering. On an average 1 culm of *Muli* bamboo yields 12,500 sticks (2.5 kg.) that can be produced by a person in a day's work.

Mritinga, *Paura, Kanakaich*, *Dolu* and *Barak* on the other hand are not affected by the current flowering wave. These species need to be focussed on to improve availability near areas of utilisation/consumption that will allow produce to be competitive. Given bamboo's time frame for growth, it is advised that as soon as clusters of activity stand identified, plantation efforts may be encouraged in private/civil lands in adjoining areas to grow species needed to meet resource needs of activity planned. Considering the species being proposed are native to the region, availability of planting material should not pose a problem. However considering the short time available for plantation the same should not be missed particularly in context of the current year. If early initiatives can be discussed with the Forest Department it may be possible to catch planting season of 2006.

Flowering may in fact present an opportunity to grow other bamboo species that lend themselves to needs of the community from a livelihood perspective and the Forest Department would do well to take cognisance of this while drawing up their plantation plans. It may also be borne in mind that the central government has allocated specific funds for flowering related activity and the State would do well to approach the MoEF, Govt. of India to access such funds.

BAMBOO IN TRIPURA

Though Bamboo grows all over Tripura, there are pockets where concentration is more. Of Tripura's total area of 10,500 sq. kms., an area of 6292 sq. km area is covered by forest constituting 60% of total area. Bamboo forest is approximately 938 Sq. Km, i.e. around 9% of the total forest area as a dominant crop, and 484 Sq. Km i.e. around 4% as mixed with hardwood forest. Importantly, majority of these forests are in North Tripura and Dhalai Dist. where incense stick production is carried out though concentration of bamboo based handicraft is relatively lower. In spite of such low bamboo forest coverage, majority of forest revenue (42%) still comes from bamboo that is Rs.175 Lakh out of total forest revenue of Rs.416 Lakh (2003-2004).

There are nearly 10 to 15 species of bamboo prevalent in Tripura. *Muli* Bamboo is dominant with over 80% coverage. It is primarily used for low value addition products, mainly incense stick and domestic needs such as gate, fencing, etc. Species like *Mritinga*, *Paura, Kanakaich*, *Dolu* and *Barak* with differing properties can be found concentrated in small pockets and are more expensive to procure than *Muli*. This is largely due to utilisation of these varied species for higher value added products as handicrafts, furniture and mats, and their relatively lower growth.

A detailed study has been carried out in 2002 on spatial and ground truthing basis for 1 district. Once clusters stand agreed upon a study would need to be done in an area considered economically viable to feed resource based on product

Bamboos transported to Chakmaghat in raft formation

line decided. This would need to be considered as one of the first steps to be taken up to get a specific fix on the resource.

In certain cases, selling raw bamboo becomes a more ready source of income than bothering with product development. In many tribal areas, where bamboo grows in large quantity (e.g. Killa) selling Bamboo is the main livelihood of many tribal families. In Killa '*haat'* (twice a week market), average sales volume of bamboo poles is 15,000 – 20,000 per *haat* day.

Paper mills are some of the largest users of *Muli* bamboo. However, paper mills and other bulk users of *Muli* will be impacted and are looking to alternate crops given its flowering cycle. Discouraging paper mills from using *Muli* once resource depletes may be advisable to prevent short supply for users, such as agarbatti stick makers who add greater value to the product. A far larger number of livelihoods also depend on this cottage industry than any other application of *Muli* justifying the need for such a step.

While records show a significant shift of paper mills to using bamboos such as *Mirtinga* and *Rupai*, it is likely that the use of *Muli* is higher than Government estimates. The lower taxation structure on species such as *Rupai* may result in official records showing higher use than actual. This issue needs to be brought to attention, because alternate species used by the paper mill – *Mirtinga* and *Rupai* – have lot of use for craftspeople of the state. These bamboo have comparatively smaller growth. Any increase in use by paper mills could potentially deplete its population to the detriment of value addition usage.

An analysis of the situation at present reveals that currently bamboo resources are not in short supply if Tripura State is taken as a whole. However, in many areas local scarcity of one or two more commonly used bamboo species has certainly occurred. Traditionally, many crafts persons and marginalised groups who work with bamboo have extracted bamboo from homesteads or nearby common property. As demands grow and common property land degrades, over harvesting of several stands and clumps has occurred leading to local scarcity.

This has resulted in bamboo artisans having to purchase bamboo species needed by them. As profit margins in bamboo work are quite low, having to pay and transport rather voluminous raw material has severely eroded profitability in some cases leading to voicing of concerns of short supply. It is another matter that these species constitute only 20% of Tripura's bamboo resource and need to be augmented through a planned plantation program looking to future needs. For now, the sector needs are met by existent supply though strains are being noticed in procurement and payment being made for raw material that was earlier available in the backyard of most homes at no cost. However looking to a market based system that the project is trying to address, aspects of paying for raw material need not be considered detrimental as long as it allows the end product to be competitive.

The normal state of a homestead bamboo clump

Table below details yield per Ha. as could be expected from a potential standpoint. In reality it is safe to assume that clumping varieties like *Muli* will yield 40 MT/ha./yr. while non-clumping varieties will yield 25-30 MT/ha./yr.

Species *(Botanical/Local)*	**Harvest** (kg/ha/yr)
Bambusa cacharensis (Bom)	36,960
Bambusa balcooa (*Barak*, *Barua*)	1,12,320
B.nutans (Mal, Makhla)	84,240
B. polymorpha (*Phaura*)	71,280
B. tulda (*Talla*, *Mitinga*)	73,440
B. vulgaris (Bari, Jai)	96,480
Dendrocalamus longispathus (Rupai)	6,400
Melocanna baccifera (Muli)	27-36,000
Schizostachyum dullooa (Dolu)	2,592
Thyrsostachys oliveri (Kanakaich)	4,500

While flowering of *Muli (Mellacona baccifera)* does present itself as a threat, the sector that will be impacted will be that of incense stick manufacturing. Whatever is not utilised can be used as biomass or for other applications such as briquette making or even as material for covering for bamboo particle boards. Though no such unit exists if Tripura, transportation of this waste can be considered to units in Assam and Bengal based on guidance got from buying parties. Options such as briquetting could be considered if needs for fuel tablet are indicated by the marketplace.

With indiscriminate harvesting becoming a norm, there is a need to go back to well established system of sustainable utilisation that needs to be supplemented with planned cultivation. Awareness building will play an important role to achieve this objective.

Species Important to Mission's Goals

Local name	Botanical name	Incense	Handicrafts	Mats	Furniture	Other Uses
Kanakaich	*Bambusa affinis*		X		X	Fishing rods, javelins
Barak	*Bambusa balcooa*				X	Scaffolding
Bom	*Bambusa cacharensis*		X	X	X	
Mal/Makhla	*Bambusa pallida*		X	X		
Paura	*Bambusa polymorpha*	X	X			
Mirtinga	*Bambusa tulda*		X	X		Edible shoots; paper mills
Bari/Jai	*Bambusa vulgaris*		X		X	Fencing, shoots, paper
Rupai	*Dendrocalamus longispathus*		X	X	X	Paper
Lathi Baans	Dendrocalamus strictus		X		X	Paper; edible shoots
Muli	*Melocanna baccifera*	X		X		Utility items, shoots, paper
Dolu	*Schizostachyum dullooa*		X	X		Handicrafts

ADDRESSING NEEDS OF PLANTATION

To address needs of sustainable plantation the following steps are recommended:

- **Resource mapping in areas around selected clusters:** One of the first exercises to be taken up would be to do an assessment of resource around activity cluster areas. These need to be borne in mind from activity/usage perspective and both public and homestead approach to growth must be considered. The starting point would be to check on data available with the forest department including recent planting initiatives such as the one noticed at Sipahijhala where multiple species have been planted. Beyond this a spatial approach could be considered. Resource maps of 1:100,000 scale would be available with NMBA and while these will form good indicators of bamboo growth, mapping species wise data will need to be done through selective high resolution mapping and ground truthing efforts.
- **Awareness and training on proper management of bamboo:** While homestead clumps are often well managed, bamboo growing in the forest is usually neither well cut nor any basic management procedures as mounding carried out. The JFM project in Tripura has had great success in getting the participation of local people in forest management, and in many areas issues such as illicit felling of timber have been greatly reduced. Local people need to be trained in clump management techniques. This could be easily managed by Forest Department given the excellent community mobilisation work that has already been done.

Additionally, incentives in terms of improved financial returns from better yields can be shown from past efforts.

- **Focus on species required for livelihoods:** Plantation programmes for bamboo are neither in areas where they would benefit local people nor are matched for species as needed by locals working on it. Species such as *Mritinga*, *Paura, Kanakaich*, *Dolu* and *Barak* need to be planted in greater abundance in forest area – in particular where forests are close to habitations where bamboo workers live. As bamboo preferences are often local, no prescription on species are recommended. Instead, JFM committees where empowered would be best in suggesting appropriate species. Decisions on which species to plan could also be taken through the Forest Development Agency (FDA) which is well represented by various interest groups.

A board speaks of efforts carried out by Forest Dept. in Sipahijhala region

Above actions do not call for any large scale change in forest management in the state. As mentioned, the total use of bamboo for various livelihood operations is a small fraction of the state's production potential. In some cases, small patches of few hectares are often sufficient to meet requirements of an entire village.

The plantation program can be tied in to environmental needs such as soil binding and wasteland development. Additionally it offers potential to be used as a windbreak system offering resistance to crops at the vulnerable stage of their early growth. Rubber for one could benefit from this.

- **Encourage homestead planting and provide good planting material:** Local people have traditionally planted bamboo in homesteads. Further encouragement and support through providing good quality planting material of appropriate species would increase the prevalence of this practice and reduce pressure on forests. This could commence with establishment of hardening facilities with mother plants of high quality stock being procured from national suppliers leading to establishment of micro-propagation facilities at a later stage. Technical expertise and more importantly the focus will need to be developed by the Forest Department on bamboo plantation. In the past, bamboo was a low priority crop with the Forest Department focussing on trees such as Sal and Teak. As the enormous potential for creating livelihoods through bamboo is realised, the forest department will need to channel some of its resources into this sector that will also help enhance incomes indicated earlier.

STRATEGY INITIATIVES

Given the importance of bamboo resource to the program and its indiscriminate pattern of utilisation emerging few points need to be pursued as par of the Mission's goals:

1. Forest Dept. must be requested to grow *Mritinga, Paura, Kanakaich, Dolu* and *Barak* species of bamboo finding utilisation in livelihood activities. This assumes importance while drawing up post flowering plantation plans when *Muli* could be substituted by more needed species.
2. Improved utilisation of bamboo will help create demand for raw material preventing paper mills from using *Muli* considering resource depletion due to flowering looking to its need to feed agarbatti stick makers who add greater value and many livelihoods depend on it. A higher taxation could be introduced for species other than *Muli* discouraging utilisation by paper mills. Such policy decisions may need to be addressed.
3. Encourage and assist plantation programmes using appropriate species in common lands near identified bamboo craft clusters.
4. Make good quality planting material available for identified species for plantation needs around clusters dependent on economic activity pursued.
5. Introduce focus and improved bamboo stands management by:
    - Resource mapping in areas around selected clusters
    - Focusing on awareness and training leading to proper management of bamboo
    - Focusing on species required for livelihoods
    - Encouraging homestead planting and provide good planting material
6. Study feasibility of sustainable harvest of Jigat bark without whole tree harvest. Determine sustainable extraction levels of Jigat and also invest in substitute technologies such as the one licensed by FRI after necessary investigation.
7. Increase productivity of natural stands through better management practices such as regular harvest of mature culms an mounding operations in clump forming bamboos.
8. Encourage private participation of organisation on PPP basis interested in plantation based on its large scale production related utilisation of bamboo.

A Case For Making Jigat Available

Considering incense sticks production is likely to be taken up as a major activity in Tripura, one of the main problems with coating of bamboo sticks with unscented intermediates is the lack of availability of Jigat bark. Jigat, which literally means 'sticky' in Kannada and Telegu, is a trade name of powdered barks of a few different species. In Tripura, Jigat is used from Litsea tree – probably Litsea chinensis (family Lauraceae). This tree has been described extensively in Ayurvedic and Unani systems of medicine for its medicinal properties (used in joint pains, for its cooling properties etc). However, there did not appear to be any local knowledge of these aspects in Tripura.

In Deccan Peninsula, where most agarbatti manufacture is carried out, Jigat appears to be a trade name of another Lauraceaus member, viz. Machilus macrantha. This species is common around Bihar as well.

Jigat functions as an adhesive or binder. When Jigat bark is powdered and mixed with water, it forms an ideal material to bind wood charcoal as well as aromatic herbs and roots to the bamboo splint. Besides having good binding properties, it combines well with other raw materials and does not influence the natural aroma of perfumed sticks. Over years, the expansion of the agarbatti industry has resulted in increased demand for Jigat leading to indiscriminate cutting of Jigat trees for their bark. This has depleted population of Jigat trees.

Methods to remove the bark in a sustainable manner have been experimented with on a small scale by Tripura Forest Department. While new bark forms within a few months of removal, there is a high proportion of callus tissue, the utility of which is uncertain for further Jigat production. There is need for further study to ascertain possibilities of sustainable harvest recommended as a possibility by Forest Department. At present, Forest Department of Tripura does not permit Jigat cutting to conserve its depleted population.

It must also be mentioned that several institutes have done research on finding a Jigat substitute. The Forest Research Institute, Dehradun has developed a Jigat substitute that is economically competitive and abundantly available. The substitute is an agro-based polymer which is said to be a superior binder to Jigat. Reports indicate that samples of this substitute sent to agarbatti manufacturers have received good feedback and this may be looked into to base Tripura's plan to establish rolling facilities.

If the Jigat substitute is indeed as reports would suggest a better and cheaper product than Jigat, it has important implications for developing the rolling industry in Tripura. The high transportation costs for procuring Jigat would probably reduce any competitive advantage of cheap labour that Tripura possesses, and it may be more lucrative to continue rolling and coating operations outside the state, in particular for low value agarbattis.

However, given the diversity of herbs and aromatic roots available in North East and in forested states like Tripura, there is considerable potential to develop a high value agarbatti industry using high quality sticks and natural products. Medicinal properties of Litsea need to be further investigated and advertised if an industry to coat unscented intermediates is to be promoted.

However, it is important to recognise the value of making good quality resource available to the community at an affordable price on a regular basis. Given its eminent position as being the starting point of a long process this needs to be given deserving attention by focussing on growth and supply arrangements through a contracting mechanism. A suggestion to this effect has been made in the "Institutional" section of the report to involve the Forest Development Agency (FDA) or a private organisation by committing resource to identified clusters and also supporting them in a plantation program in areas identified around the cluster.

INSTITUTIONAL STRUCTURE

INSTITUTIONAL STRUCTURE

In order to increase employment and income for bamboo sector in Tripura creating a strong and responsible institutional structure assumes much importance. This has been seen as one of the major failings of the past resulting in lack of confidence shown by producers and market. This is bound to result in potential not being exploited and middle-men thriving to the detriment of the two interested parties. Thus positioning a strong institution, one that functions as an "honest broker" to drive the agenda of sectoral growth promoting interests of both producer and buyer would be an absolute necessity to make a success of the Tripura Bamboo Mission effort.

Initiatives of past have focused on piecemeal efforts in various areas such as technology, plantation, design and skill development. Though many recognised national and international institutions have been involved with these efforts, none could deliver a sustainable solution adding to the frustration of those involved with the bamboo sector. Purbasha has played a critical role in promoting bamboo handicrafts at a time when no other institutions were available in Tripura. Since its formation it has provided better income to local artisans by supporting them with design inputs and market arrangements delivered through formed clusters and groups.

Another institution Bamboo & Cane Development Institute (BCDI) sponsored by Development Commissioner of Handicrafts (DCH) has enjoyed a technical collaboration with NID in the past. While even today training is carried out, the Institute wears a neglected look and is grossly under-utilised. The influence of both Purbasha and BCDI has been declining over the past few years. While these institutions have weakened, the roles they have played assume importance more than ever before and an improved structure is needed to fill the void created. Both institutions however offer hope to contribute to Tripura's bamboo development plans though may have to assume a reincarnated form.

Considering the importance of bamboo sector to Tripura due to its much promised potential and lack of other opportunities beyond it, it is no surprise if people of Tripura are feeling let down. Looking to present growth, employability, and overall economic size of the sector, the economy can at best be termed as being marginal. The aspect of strong institutional support needs to be addressed if producers and buyers involved with the bamboo sector have to develop confidence to participate whole heartedly in the program.

This section does not attempt to recommend new kinds of entities. It aims only to identify functions for which institutions or institutional support is required. If old and existing institutions can be revived to fulfil functions for which they were set up perhaps there is very little that is new that would be needed.

Some points that need to be paid attention to while pursuing goals of institution development are:

1. FOCUS ON PROMOTING ENTREPRENEURS RATHER THAN MONOLITHIC STRUCTURES: Despite huge Governmental intervention and expenditure the bamboo sector in Tripura seems to be driven by small business persons and entrepreneurs. The huge agarbatti stick industry is an excellent example. Not only does it constitute the largest use of bamboo in Tripura, but perhaps close to 80% of bamboo sticks in the non-premium category are supplied by the state. A long chain of middlemen and businesses exist, each buying from the previous link in the chain, consolidating volumes and carrying out a step or two before selling to the next rung. There is little Governmental support, help or interference and the entire supply chain moves quite efficiently and there is no further need for institutional mechanisms. However, external support in the form of

access to capital, training, quality control and introduction of appropriate technology to improve productivity can improve efficiencies and returns. This could result in reducing one or two steps resulting in increased incomes for stick producers.

2. GOVERNMENTAL SUPPORT CAN BE OUTSOURCED AND RUN IN A MARKET MODE: BCDI in particular warrants a specific look at and could achieve its objectives better by being transferred on a PPP basis or through any other suitable mechanism. Support then can be contingent to training output, and measurable indicators can be developed to determine impact of training. Support can be maximised to groups that achieve a high level of training, while support can be withdrawn from the group that has poor performance, with new groups being identified for support. In this manner rather than create more institutions, Government can support institutions that work efficiently.

   While it can function as the national apex body for bamboo and cane training, it can also help serve needs of Tripura. This can be done by linking the proposed 10 cluster CFCs to it for their training and design needs.

3. FOCUS ON RAISING INCOMES, NOT JUST INCREASING EMPLOYMENT: A major issue in the bamboo sector is that many activities – such as agarbatti stick making or mat making - are marginal and do not provide incomes comparable with daily wage earnings. Consequently, many bamboo based activities are carried out by the old and infirm, children or people who are not able to find employment at that point. Increasing incomes to a point where they are at least comparable to daily wage earnings for unskilled labour will greatly increase the interest in the bamboo sector. While skills already exist, often aspects such as inefficient distribution, lack of attention to quality, or existence of too many middle men in the chain leads to producers getting low incomes. Focusing on these issues and maintaining consistent quality through perhaps a branding or certification mechanism can greatly increase returns to producers. This would automatically considerably increase the employment generation capacity of this sector.

POSITIONING AN INSTITUTION TO DRIVE THE GOAL

As has been discussed, one of the failings of the past has been the lack of a strong institution to function as an effective link between the front end (market) and the back end (production). This has also deprived the sector in the task of volume building given little aggregation/federated efforts carried out. An unorganised sector also makes it very difficult for the government to lend support with all its good intentions. As a result confidence has been prevented from developing in the system and the sector has functioned as a fractional contributor to the economy due to lack of economies of scale. This view was corroborated from market visits where bamboo based enterprises have pointed it out as a major weakness leaving their demand for primary processed material unfulfilled.

A strong institution thus needs to be positioned to deliver on goals of the Tripura Bamboo Mission, one that enjoys confidence of state government yet is able to function proactively to achieve desired results in an optimal manner. This will need to be addressed through an appropriate institutional structure as suggested below to be formalised through a series of discussions with interested groups.

The aspect of cluster level institution in particular will need to be carefully thought through. There has been either a lack of effort in the past or when attempted (through few CFCs noticed) have ended up being under the control of individuals who have used it to largely meet their own needs in the name of the community.

If this is to be the case, commercial funding and not public funding should be utilised. What also needs to be borne in mind is the fact that in an enthusiasm to foster equity (with community members in particular), a weak institutional structure should not be created that is self destructive on all counts eventually meeting nobody's needs. The process of involving community too needs to be linked to improved capacity and responsibility leading to increased say in management. We also need to realise that unlike other states, Tripura does not have a strong civil society base and this needs to be addressed for any effort to find rooting in grassroots.

The institutional structures that would need to be developed or strengthened would depend in large part on the product in question. However, looking to the need to fulfil functions as required by the Mission, certain kind of agencies or individuals may need to be developed or empowered as indicated below:

1. TECHNICAL SUPPORT INSTITUTION - An institution that provides technical inputs and access to information on mechanised equipment usage is needed. Such an institution would need to work with industry that might have or need to develop machines for say agarbatti stick making, or tools that help make more uniform strips for mat making. It might work towards developing processes for bamboo treatment, providing colour for aesthetics or protection from insect attack. Increasing applicability of bamboo, or further processing by development of locally appropriate technologies, eg. for agarbatti stick rolling, would also be the mandate of such an institution. Such an institution would also help address craftsperson's need of productivity and quality enhancement leading to improved value returns.

   One manner in which this could be achieved is by creating a cell within the project implementing agency that can liase not only with an institution such as National Mission on Bamboo Applications (NMBA) but also with machinery manufacturers, suppliers of equipment and consultants. This centralised approach will allow for bulk negotiation of rates, performance assurances, and assessment and approval of things that can deliver while keeping away efforts that have failed. Most importantly it will ensure unified delivery of quality effort to upgrade the sector.

2. DESIGN SUPPORT – this would be required in some sectors such as handicraft and furniture making. A systemic change though is needed to bring about a transformation for Tripura and this has not been done in spite of many years of effort by known institutions. In the past NID has played a role to bring in design transformation but their efforts have resulted in few products being produced and marketed. While their capability towards design is not in doubt their lack of ability to address needs of production and hence business growth must be borne in mind. The aspect of developing design capability within the state has also not been addressed and while 2-3 individuals keep getting involved with efforts nobody has a stake in the overall growth and building of volumes. It is important to bear in mind that the design function is an agenda that needs to be synchrous to efforts of the market. The real fruits can be borne only if they work in tandem that is something the project implementing agency will attempt to do. The past efforts of branding through "Olom" brand have shown good results even though it was carried out as a one time effort. Learning from past effort will need to be applied and the brand name itself may be considered for utilisation. In particular, designers involved with past efforts may be considered for recall given experience gained.

3. CLUSTER DEVELOPMENT AGENT – individuals or organisations that can help mobilise community, administer crafts clusters or help strengthen self help groups are needed. Promoting effective SHGs, of artisans, plantation workers and JFMs working for bamboo plantation in forest areas will serve the key purpose of cluster development strategy. This is important in all clusters of Tripura as SHG members play a very important role in realigning the relationship between key actors in the cluster and provide crucial services as well. Though in most clusters SHGs are already formed, many of these are non functional. It is important to identify effective agents for meaningful development of SHGs. This resource may emerge from CDA, PrIA or may be a local NGO. The responsibilities of these agents would be:
    a. Formation of new SHGs in the cluster and enabling them to pursue identified activities.
    b. To encourage effective SHGs and help them function more efficiently by providing capacity building and management support.
    c. To regroup ineffective SHGs, build confidence and capacity within them and make them aware about the power of collaboration amongst themselves for tackling livelihood related issues.
    d. Linking all SHGs to institutions and providing necessary support for smooth running of SHGs.
    e. Help assist business processes to facilitate grassroots linkage of SHGs with organised cluster organisation/facilities.
4. ENTREPRENEURS – there already exists a tradition of small businessmen who either buy products from craftspersons or mobilise and supervise them to achieve production needs. Most of these are small entrepreneurs with a turnover of Rs 5 – 10 lakhs per year. A list of such entrepreneurs is attached as Annexure G. Support to such businesses to help further develop them and expose them to markets would be of benefit. Access to capital, design support and quality ability are areas where support would be of benefit. One such package could be in the manner of Hard and Soft packages as to be delivered through a contracting mechanism with the project implementing agency once entrepreneurs decide to align themselves to the TBM programme.
5. FINANCIAL INSTITUTIONS – In any other region typically one would look to existing banks to fulfil this role. In reality the banking sector is not able to service the needs of growth of the tiny and small sector given lethargy, rigidity or even lack of interest other than meeting obligatory commitments. As a result various institutions such as MFIs have mushroomed and done yeoman service to service needs of the poor.

   Within the NER, an organisation such as RGVN has built a strong reputation for reach and delivery to meet needs of livelihood finance. Organisations such as these should be invited with some form of support to pursue goals of financing. On the other hand existing banks and credit agencies may be encouraged to lend by addressing policy issues or ensuring a higher inclusion in the program through a special intervention. This will need to be backed by seeking support from re-financing agencies like NABARD, SIDBI, etc. for which they will need to be sensitised and special package discussed if thought necessary. There are government schemes that can be tapped on an institutional basis, eg. Special SGSY Scheme, and the project implementing agency should look to pursue such opportunities. Other schemes may be pursued by cluster organisations

individually as applicable for which the project implementing agency may play the role of counsellor and enabler.

Another important ingredient to help step up financing efforts will have to come on the part of training of entrepreneurs in making bankable projects and understanding needs of banks, for which consultants and accountants could be empanelled by the project implementing agency to ensure quality of service.

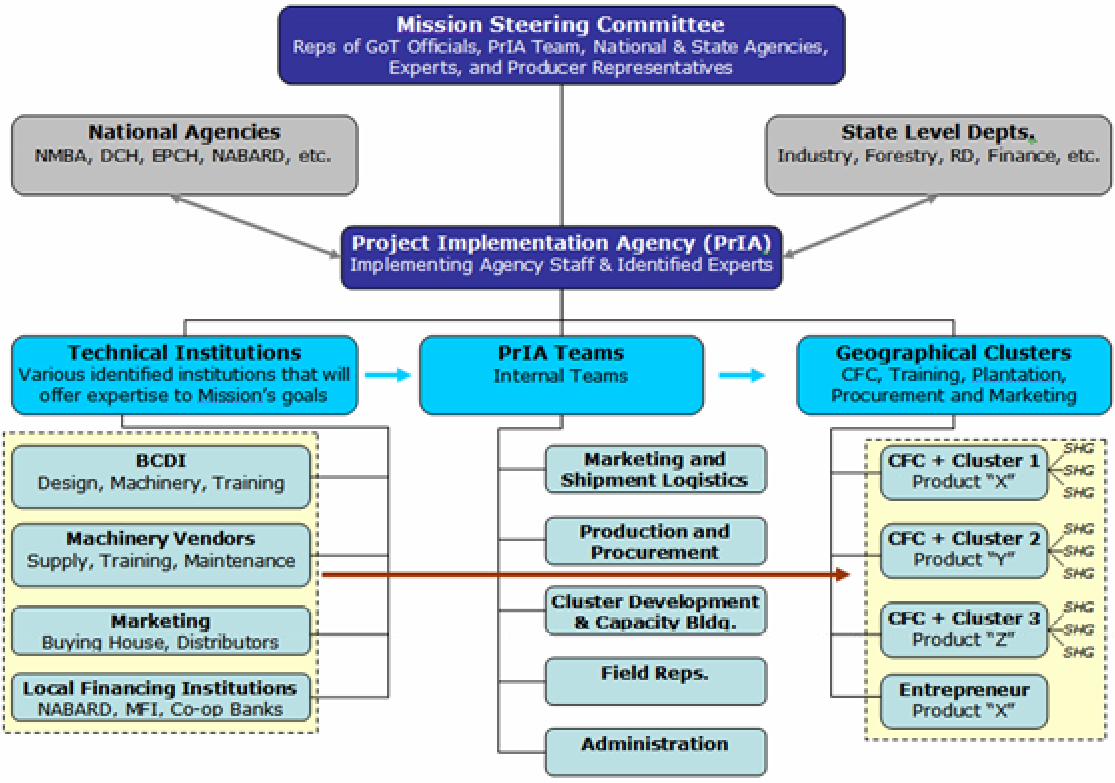
6. CERTIFICATION AGENCY – As suggested earlier the "Olom" brand could play a role to commence with – as a brand that stands for "good design appeal and quality production". A dedicated division within the project implementing agency could address these needs of branding, certification and quality establishment for which the functionary will collaborate with those involved in capacity building.

   While goods may be procured from a variety of entrepreneurs or sold independently by various agencies, minimum quality standards as established under this program will need to be adhered to for goods marketed under the "Olom" brand logo. Thus it will function more like an ISI mark (or organic food certification logo) rather than a regular brand name that it began with. Over a period of time an institution to certify the quality and manufacturing practices of goods sold under this logo is suggested. Finally we need to remember that a quality logo needs heavy investments in promoting it for people to be aware. This would be advised once initial efforts have started to indicate an improved momentum in market terms.

The above should not be construed to mean that there is a requirement for multiple agencies in addition to entrepreneurs. Instead, what is listed are functions and often, a single institution may fulfil many of the above functions (see box below), the project implementing agency in this case. As an example, it has been noticed that another local institution TRIBAC has taken on the function of technical support and community mobilisation as well as some design support for those involved with its programs.

At the same time the project implementing agency needs to maintain a strong focus on networking amongst all players to help raise the bar on local capability. Lack of awareness at times can be the biggest hindrance to growth. Information like market prices, technology options, and material availability can prevent fair competition to build a strong market structure. Sharing of information would help ensure that craftsperson gets fair prices for their products and entrepreneurs do not unfairly lower prices. Such efforts can also help provide potential buyers with information on clusters, groups or entrepreneurs who specialise in certain kinds of products. This brings to attention the need for all such institutions to utilise ICT effectively for knowledge sharing and communications considering its ability to bridge distances at a rapid pace. However effective utilisation should be encouraged through training and building of workflow applications.

This important aspect of overall institutional structure is proposed to be managed at various levels as detailed in the chart shown on following page.



A **Mission Steering Committee** should be constituted to oversee the entire Mission and provide guidance and local facilitation as required. It is suggested that Chief Secretary should chair this Committee looking to the government being a responsible stakeholder in the Mission and inter-departmental needs that will emerge while growing the bamboo sector in Tripura in a short period of 3 years. Such a structure will allow GoT to be informed of all decisions being exercised yet give PrIA autonomy to function and meet needs as an efficient and competitive management set up.

A system of budget, sanctioned on basis of presentation of an Annual Work Plan & Budget will be followed with utilisation framework spelt out. The following year's needs could be considered after a six month period by when at least two detailed quarterly reviews will have been carried out. This will allow sufficient time to GoT to assess progress made, clear the proposal for the year ahead, and not hinder operations for the project implementing agency.

Project Implementation Agency (PrIA)

Tripura Bamboo Mission needs to be managed on joint participation basis as a body constituted by Government of Tripura. The body will function in a two tiered manner addressing needs of (i) advisory/oversight, and (ii) operational management through a Mission Steering Committee and a Project Implementing Agency respectively. The operational/implementation aspect need to be managed by Project Implementing Agency (PrIA) that may function as a constituted body. Participation of Government of Tripura and other project stakeholders for advisory and oversight needs will be addressed through the constitution of a Mission Steering Committee that will review performance of PrIA on a quarterly basis. This will help address needs of efficient project management and also those of keeping the stakeholders involved on a time-to-time basis. Aspects of bonding and project ownership particularly from a long term sustainability point of view

will be addressed if a fair representation of stakeholders and experts is brought into the proposed Mission Steering Committee.

Past experience suggests that if accountability is to be addressed, a clear ownership/mandate should be given to the implementing agency, in this case PrIA, to pursue Mission goals, else it may pose difficulties from an implementation perspective. Thus this constituted body should have clear authority to function within an agreed framework with minimal interference else it can't be held accountable for delivery.

PrIA will commit itself to achieving goals of Tripura Bamboo Mission and drive needs of clustered activity particularly addressing collective needs of market, technology, design, credit and policy. To an extent, this institution will have to take a position on both ends, production and market, to develop confidence in the minds of both producers and buyers alike, leading to scaling up of volume production. To achieve this, it will need to be willing to enter into contracts for procurement and sale on collective basis of quality approved goods, much like an underwriter.

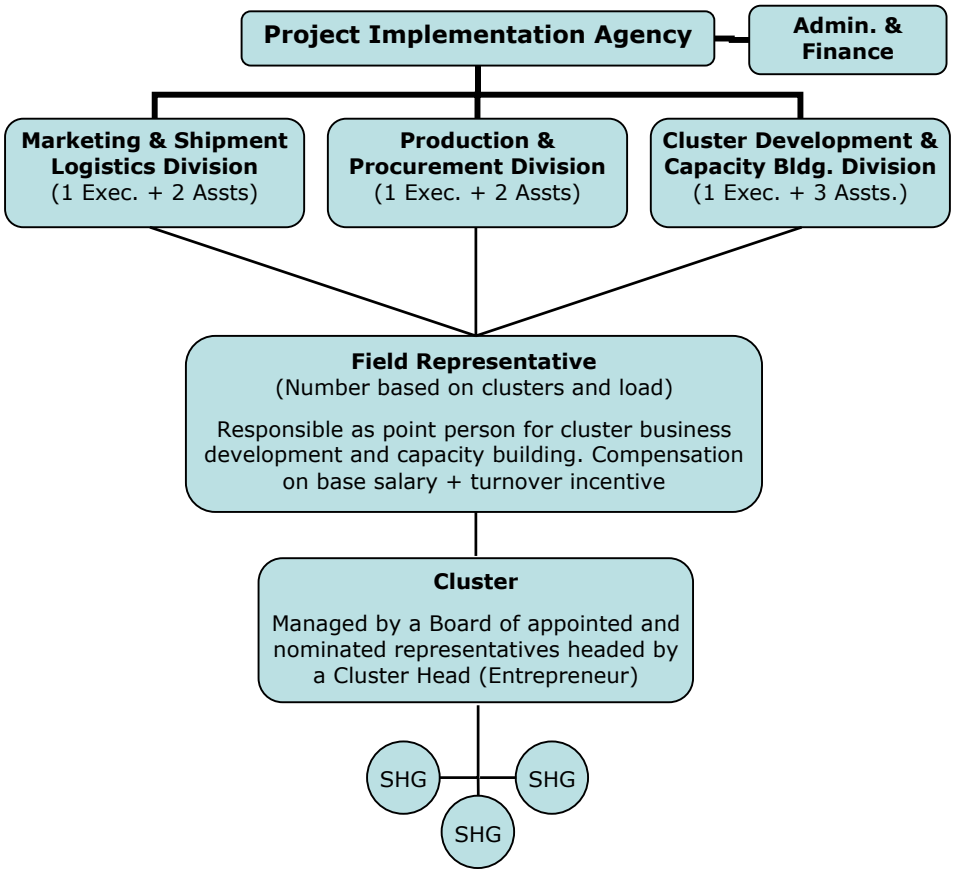
The Mission can mandate PrIA to develop an exit strategy that will point to developing and enabling an institution to carry forward its work after 3 years. As part of this measure a few key members will need to be identified 7-8 months prior to close of PrIA's term and these members will need to be inducted into PrIA to ensure a smooth transition for the last 6 months of its functioning.

Another key decision that needs to be considered is to look at an involvement with the already established **Bamboo & Cane Development Institute (BCDI)** at Agartala. This is being suggested to align and to an extent merge activities in a manner that Mission goals are better served. It needs to be borne in mind that a successfully managed BCDI will have a positive impact on the development of the bamboo sector nationally. This could be done by approaching the Ministry of Textiles, Govt. of India and possibilities may be explored. A note detailing thoughts on the need and importance of a strong institution such as BCDI can be found at the end of this section.

As implementer of the Tripura Bamboo Mission, PrIA will address all cross cutting issues related to the sector's growth in the state and outside it, including capacity development, policy, technology, design inputs, market strengthening and financing mechanisms. This will be managed by a 6-7 multi-skill member management structure based in Agartala. They will maintain an active link to the field activities through Field Representatives appointed as staff members. PrIA will also work at proactively facilitating market linkage process and even try to establish market shelf space in terms of display and warehousing at major markets. It will also give valuable direction from a market perspective that will help reinforce cluster organisation's efforts. It will encourage promotion of cluster level organisations and function in a manner to create and strengthen capacities and opportunities for such organisations.

The organisation will work through key divisions addressing needs of Marketing, Production and Cluster Development. It is proposed that they work through Field Representatives (FR) who will be the interface between the clusters and PrIA. These Field Reps will need to be employed on incentive terms with generous rewards bestowed for authentic results achieved. A sales incentive based compensation system to ensure their involvement with affairs of the cluster including its business growth would help drive common business goals since their remuneration will be dependent on higher business done. In this manner the cluster's needs on day to day basis will also be looked at by him since a drop in the same will reflect on business done.

The proposed organisation structure for PrIA may be planned such:



Specifically, the following are certain important points to be borne in mind as far as the Project Implementing Agency is concerned:

(i) PrIA to be formed as a constituted body that will function in an autonomous manner within an agreed framework. The implementing agency must agree to a set of responsible business practices while pursuing project goals.

(ii) PrIA may be headquartered at Agartala with Field Representatives appointed to manage geographical growth.

(iii) This body will need to be empowered to deal with various departments within the government with mandated authority vested in senior officials involved.

(iv) The package of offer will need to be firmed up for "Hard" and "Soft" components (indicated later) that will incentivise involvement of activity through PrIA.

(v) Needs of credit will have to be addressed on a priority basis with agencies involved with commercial banking, livelihood financing and government scheme based agencies.

(vi) Various agencies who can perform an important role in advancement of the sector in Tripura may be contracted on needs and terms identified to provide support services. To begin, NMBA, DCH, NID, BCDI, IITs may be approached. This has been indicated by way of an Institution Responsibility Matrix attached as Annexure B.

(vii) On the other hand private entrepreneurs who have indicated their preference may be invited for discussions and policy and package based needs may be reviewed for them to proceed. By doing so, immediate needs of growth will be addressed with specific points to

be addressed as indicated by them. While things are still being established this may offer activity initiation opportunities. Efforts may later be initiated to invite large buyers to see operations in Tripura to indicate efforts underway and seek suggestions to suit their needs as found feasible.

PrIA will network with various national/technical institutions on need basis.

Types of Support Organisations Assisting PrIA

Other than its internal departmental staff and experts, PrIA will achieve mission activities with the help of two types of support institutions who will align themselves to needs identified:

1. TECHNICAL INSTITUTIONS: These will cover organisations providing regular ongoing support to PrIA and the cluster groups on subjects such as design, training, finance, technology, marketing, etc.
2. GEOGRAPHICAL CLUSTER BASED ORGANISATIONS: These will be the cluster based groups constituted through a CFC that will be the one point source/representative for the cluster's needs of training, procurement, marketing and production linked to PrIA.

Institutions may exist at cluster level that are entrepreneur or community owned. Aspects of equitable sharing in opportunities, outputs and risks; transparency and accountability will need to be built in. There could be as many institutions as sub-sector clusters based on market potential taken up for development in a phased manner, and rigidity of structure is advised against to encourage growth.

Addressing Policy Issues Identified

On the basis of past studies and those done by the TBM Study Team following policy issues are being presented for consideration. While project implementation will not wait for enactment of these measures and will proceed regardless, addressing them will give TBM's efforts the required impetus:

1. REGULATORY
    a. Measures directed at encouraging free movement of bamboo from forest and homestead areas
    b. Improving availability of Jigat through a FDA based mechanism to encourage the incense stick rolling industry
    c. Developing an innovative and usable system to extend subsidy for transportation movement. In its current form the subsidy is hardly availed of due to difficulties in managing refunds
    d. Opportunities of trade with Bangladesh
2. FISCAL
    a. Incentives tuned to specific needs of sector given its impact on livelihood and environment
    b. Favourable direct and indirect tax levies as possible. Also needing to be addressed are levies of inter-state movement that are adding to existent transport burden
    c. Credit infusion support to encourage entry of MFIs in the region to drive the livelihood related lending programme

ROLE OF CLUSTER DEVELOPMENT AGENT

Considering various problems of clusters that are production based and have capability of developing as a viable sub-sector, role of a Cluster Development Agent (CDA) involving broad based cluster actors is essential. This responsibility could assume a shape such as that of Business Development Services (BDS) provider as the project progresses becoming an important link to meet needs of the project contributing to its sustainability. CDAs will interface with PrIA for successful implementation of project components needed at the grassroots level. The CDA will function as a change agent and could be an internal or external group. Merits and demerits of both forms should be considered before finalising the arrangement. However if PrIA has internal skills dedicated to this purpose even they could carry out this task of cluster development.

It seems that existent cluster development approach may not have achieved desired objectives in the past due to lack of representation of stakeholders involved. Much thinking has to go into the final structure of the CFC/cluster organisation but an indication is given below of needs of such an organisation. For one it should not be defined in too rigid a framework since that will compromise on overall needs. Such an organisation could be run through a non-profit mechanism with ownership shared between various cluster actors with proportional representation with respect to stake identified in the cluster. The structure may vary in different clusters but broadly should cover important cluster actors as below:

1. Entrepreneurs/Traders
2. Existing Cluster heads
3. Financial Institutions
4. Technical Institutions
5. Representatives of existing participating artisan SHGs
6. Representatives from Forest Dept./ Plantation SHGs

Within the cluster the organisations could be of profit or non-profit nature, could be an individually owned, community owned or even a joint ownership structure.

The cluster based organisations created can function in a network mode and be structured in a manner that hard and soft components forming part of the deal offer a business advantage to those involved. This will then give encouragement to groups to join and operate through such a partnered structure formalised through a contracting arrangement.

Such cluster organisations will be encouraged to be established at points where potential exists from a volume production and market perspective and can be rolled out as needs of the project emerge. A suggestive list of locations based on activities has been indicated on page 57 as noticed by the team during its visit to field locations in Tripura. A boxed item on page 66 suggests an institutional mechanism through which such organisations may function.

Where activities are fairly organised at the grassroots and are displaying inherent volume tendencies the organisation could take the shape of a co-operative of SHGs federated together. On the other hand if there is a need for specialised products or one that need development efforts to take it to maturity, it may be prudent to encourage the involvement of a private entrepreneur through a partnership route to the extent possible.

All clusters will need to be linked to PrIA if they are to avail the package of incentives in Hard and Soft terms indicated. Overall delivery may be ensured through a contract mechanism addressing needs of sector growth as decided by PrIA. Each cluster would be managed by an entrepreneur and a package constituting technology, infrastructure, training, resource supply, and market

linkage to name a few important points will be offered on signing of contract with PrIA. These will be decided after their needs have been studied based on product lines decided to be pursued, and could typically constitute the following:

HARD COMPONENTS

- Land & Building with storage area

  Existent (unutilised) cluster/training facility could also be studied for takeover, though feasibility would need to be ascertained before committing on this count

- Power, Water & Communication supply commitment
- Pickup like transportation vehicle may warrant consideration
- Machinery, equipment & fittings tuned to identified requirement will be considered. However if additional machinery not required in the short term can help contribute to overall completeness of capability for a small cost difference, the same may be considered
- Consumables and Spares

SOFT COMPONENTS

- Contract arrangement with Forest Development Agency (FDA) or private supply groups (feasible in Tripura given free movement of bamboo permitted, though not allowed in other states) for supply of various species of bamboo based on projected business plans of cluster.
- Annual forecast for various species could be indicated and contracts signed for supply with penal clauses for non-supply. In any case warehousing must be encouraged to hold stocks as identified.
- Simultaneously land will need to be identified around cluster areas for community based plantation activity under guidance of FDA to achieve self-sufficiency in 5 years, meeting resource needs on a proximate basis. Over time this stability of supply will be a key advantages for the cluster
- Mobilised community through SHG mechanism involving separate groups of women and men
- Policy initiative to give support to cluster organisation to compensate for issues such as transportation, lack of initial volume if need felt
- Ongoing market, capacity building, design, & certification support by PrIA
- Credit arrangement on needs and scale of operations to be sourced from commercial lenders negotiated by PrIA. This will be over and above monies raised and deployed by an institution involved with livelihood finance or community SHGs through efforts of micro-credit
- Business Development Services will be an obligatory service that each Cluster Organisation will have to provide to allow general business development of the area. Basic services needed for self and others on payment basis such as telephone, fax, email, printing, computer, transporter desk, etc. will need to be made available at the cluster level

There will be a strong training obligation for cluster organisation to help lift the overall capacity of the sector assisting the mission program in its goals. During the first 6 months, 3 batches of 20 (roughly 1 set) community workers could be proposed to be trained. Training obligation may be considered for continuance after first 6 months and should be audited for performance evaluation.

Strong Monitoring & Evaluation Mechanism Needed

Considering various inputs, funding agencies and deliverables, a strong Monitoring & Evaluation mechanism will need to be positioned to ensure the project is kept on track and meeting expectations of outputs (deliverables) and outcomes (larger impacts) in both qualitative and financial terms. The body to manage this function should enjoy autonomy of reporting to encourage them to be effective in functioning.

Roles contemplated for various institutions

While a matrix of roles to be played by involved institutions can be found in Annexure B a detailed listing of role expectations is presented below:

CENTRAL GOVERNMENT

Key institutions involved:

- Ministry of Rural Development
- Ministry of Industries
- Ministry of Agriculture & Co-operation
- Ministry of Environment & Forests
- Ministry of Small Scale & Agro Industries
- Ministry of Textiles (DCH, EPCH)
- Ministry of Science & Technology (NMBA)
- Ministry for Development of North East Region

Issues expected to be addressed:

- Policy changes as may need to be addressed
- Support through various schemes announced for funding and capacity development
- Financial, technical, infrastructure, and market support from agencies such as NEC, NMBA, DCH, KVIC, NID, etc.

STATE GOVERNMENT

Key institutions involved:

- Industries Department
- Rural Development Department
- Forest Department
- Finance Department

Issues expected to be addressed:

- Budgetary support as agreed
- Inter-departmental co-ordination issues
- Policy changes as may need to be addressed
- Support through various schemes announced for funding and capacity development
- Development of infrastructure
- Community mobilisation and federation needs
- Sustainable management of bamboo resource and Jigat needs through FD
- Availability of finance as committed to agreed plans

PROJECT IMPLEMENTATION AGENCY

- Needs of project management
- Institutional development and refinement
- Effective mobilisation of community
- Development and strengthening of clusters and networking needs

- Capacity building of community and other stakeholders
- Bamboo resource management at SHG/Cluster level
- Establishment of marketing network
- Development of infrastructure
- Responsibility of project goal delivery

TECHNICAL & FINANCING AGENCIES (incl. those forming part of government)

- Technology support
- Marketing, finance & design support (stand alone or through buyers)
- Infrastructure support
- Capacity building support
- Credit needs
- Consultancy needs for functional and project management needs

NGOS AND VOLUNTARY AGENCIES

- Community mobilisation
- Capacity building
- Bamboo resource management
- Micro-enterprise support services

ENTREPRENEURS

- Financing enterprise
- Community and resource management
- Skill development
- Managing enterprise

Revamping BCDI to Contribute to Goals of Bamboo Sector

While institutions are created with every good intention, their success can only be assessed over a period of time as activities and situations unfold. The process of institution development is a constantly evolving one and many a times it is no surprise that things don't turn out the way they were supposed to. It is only over time that stability is achieved, sometimes with changes in structure brought about through experience and feedback.

When BCDI was incorporated, it had set expectations to serve as a centre of excellence on the subject of bamboo and cane product design and production. Locating it at Agartala was the right decision looking to the role and contribution of the material to the region. The institution has gradually evolved in its functioning and very many artisans thank their improved ability to BCDI's support. However of late the institution seems to have withered and does not have an energetic air about it. While training sessions are conducted, BCDI is not connected and integrated to wider needs of the sector. Through this period, there was a brief period when NID was involved with the institution helping evolve an improved design culture. A void has since set in since efforts put in by NID could not be scaled up to meet volume market expectations.

At current point of time BCDI has a staff of 7 members. There is an Institute Head supported by a supervisor, a storekeeper, an accountant and three other staff members. The institute has conducted a total of six training programme batches during last three years from which 107 trainees had benefited through courses of six-month duration.

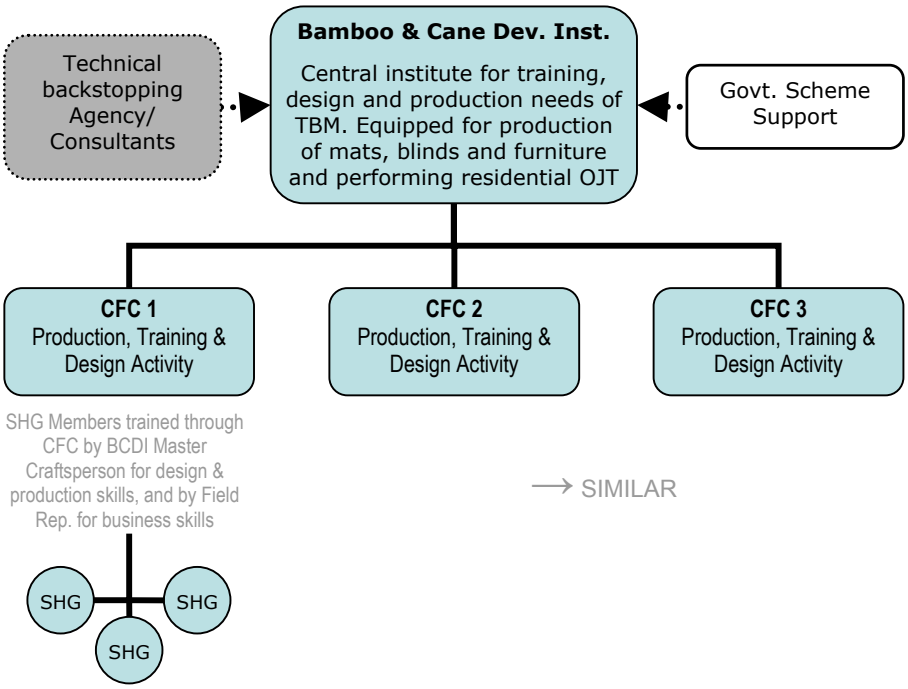
Considering the increased awareness about the sector and potential it offers, the need for BCDI to contribute now is probably more than ever. The Ministry of Textiles would do well to initiate revitalising efforts for a different model to emerge giving it a deserving position of eminence in the sector. To this end, the following measures are proposed for consideration:

1. An institution such as BCDI must be run as a training, demonstration, and job work facility centre. It must encourage continued participation of active stakeholders. This could be managed by offering work facilities that not only help achieve better return on investment but also improve on delivery effectiveness given interaction of training with a production based system.
2. The management of BCDI needs to be looked at in new light and must be considered for handing over to a partner that can manage it effectively. This will help build better context to needs of the sector. The need too has to be re-assessed given the high sectoral growth in recent years resulting in changing dynamics. The proposed partner organisation will have to enjoy the confidence of government with capability and interest in the bamboo sector to put BCDI back on track.
3. Efforts to build internal capacity need to be prioritised and external agencies should be viewed from a strategic partnership perspective useful to meet needs of technology/design transfer on "Train-the-Trainer" basis. This will prevent the system from collapsing should the external input be withdrawn.
4. Other than staff currently employed, professional experts with fixed commitment of contribution for number of days in a month needs to be planned. Typical category of professionals needed to come on board are:
    a. Designers with links to buyers/market should be given preference helping connect to onward production systems developing confidence in the buyer on quality of inputs.
    b. Marketing professionals/buyers from the trade bringing with them linkage to industry and its needs.
    c. Technology and design development agencies like IIT, NID, and NMBA. This will help BCDI learn of innovations as they happen and apply to process pursued.
    d. Other professionals involved with bamboo and handicrafts sector to bring an overall balance to efforts planned for the organisation.
5. BCDI's efforts should connect to other efforts in the field through deployment of Field Trainers who can train at the point of work rather than have all potential trainees travel to Agartala for first level of exposure. First level training on design, quality and other aspects using tools and jigs could be completed by field staff at locations where artisans function to increase reach. Subsequently they may be deputed to BCDI on a batch basis to achieve advanced training. This training itself should be an ongoing and constant process, reducing time spent on every successive visit but at a good frequency to keep their mind alive. Other than skill development, business ability enhancement should form part of curriculum.
6. Similarly, it should improve on its involvement with needs of the sector rather than wait for training assignments to come their way. Some initiatives could be:
    a. Holding of annual fair at Agartala and presenting output of Tripura's talent pool at fair locations outside Tripura
    b. Maintaining a database of artistes/organisations involved with craft manufacture to share with those needing to source producers
    c. Acting as a consolidator in the case of a large order to distribute to various groups, collect and ship out to buyer
    d. Playing role of a quality certifying agency for orders shipped
    e. Managing a distance learning module in conjunction with NID, IGNOU, ITI, etc.
    f. Training technicians on maintenance under guidance of machinery supplier
    g. Function as a networking node to promote interests of sector within and outside Tripura
7. It will be important to assess equipment installed against total needs to run a pilot training and production unit. Not only will equipment installed need to be made

operational but other equipment as identified will need to be procured for which a machinery supplier's involvement may be planned. A position of responsibility coupled with maintenance commitment will help the supplier achieve preferential status as supplier of equipment and keep their interest alive in BCDI and field installations.

8. Looking to programs related to bamboo sector in various states, BCDI must take advantage of such an opportunity to tie in with such programs on a long term basis. These could be GO and NGO managed initiatives and should be explored and contracted for annual timetable of requirements. This can shape itself into a revenue generating activity over time.
9. Improved avenues of opportunities will need to be addressed for those trained. Unless their employability and value realisation for work improves there will be no interest to develop self skills. To this end placement needs have to also be addressed that can be done once the institution is involved with efforts in various locations.

The chart below suggests the functional structure of BCDI in the new scheme of things if agreed and pursued with government's concurrence.



Details of course will need to be worked on the basis of a detailed study carried out that should point to the evolved role expected from BCDI given current day needs in terms of present day problems and suggested measures. The effort will have to largely cover two aspects:
(i) Functioning, and (ii) Institutional/management structure. It may be noted that Office of Development Commissioner Handicrafts is in discussions with IL&FS to look at efforts leading to restructuring of handicraft sector.

Based on various points concerning the institutional effort covered table below shows benefits likely to emerge in the long term:

Salient Features of Current & Proposed Institutional Approach

No.	CURRENT	PROPOSED
1	HALF HEARTED, DISJOINTED EFFORT	CONNECTED/LINKED AND INTEGRATED EFFORT
2	WEAK INSTITUTIONAL POSITIONING	STRONG DRIVING INSTITUTION WITH OVERALL PLAN AND MARKET LINKAGE
3	GOVERNMENT DRIVEN – NO MAJOR ROLE FOR ENTREPRENEUR	ENTREPRENEUR DRIVEN – MAJOR DRIVING FORCE, GOVERNMENT TO FUNCTION AS ENABLER
4	CASUAL, MARGINAL, LOW VOLUME	INDUSTRIAL, CONTINUOUS, HIGH VOLUME
5	SELF ABILITY DRIVEN	MARKET NEED DRIVEN, STRENGTHENED ABILITY
6	DEPENDENT ON PURBASHA	INDEPENDENT MARKET LED THOUGH PREFERRED PARTNER STATUS ENJOYED BY PURBASHA
7	NO COMMITMENT TOWARDS SUPPLY OF BAMBOO RESOURCE	COMMITTED SUPPLY THROUGH ARRANGEMENT WITH FDA/PRIVATE SUPPLIER
8	WEAK CAPACITY BUILDING WITH ONWARD LINKAGES	SERIOUS COMMITMENT TO CAPACITY BUILDING, ONGOING
9	GRANT/DONOR DRIVEN	INVESTMENT AND RETURNS DRIVEN
10	NO BUSINESS DEVELOPMENT SERVICE PROVIDED IN REGION	CLUSTER ORGANISATIONS WILL OFFER BDS FOR IMPROVED PROGRESS OF REGION
11	POOR MARKET UNDERSTANDING AND CONSEQUENTIAL LINK	REVERSE WORKING FROM MARKET NEEDS AND SUPPORT THEREOF

CLUSTER DEVELOPMENT

CLUSTER DEVELOPMENT

An understanding of clusters in Tripura is crucial for their development. It can and holds hope to be the vehicle for development of a vibrant sub sector functioning as a medium for tackling rural poverty, employment creation, and empowering weaker sections of society. The cluster development approach is expected to effectively bring these weaker sections into the larger market through various support mechanisms.

CLUSTER FEATURES: Clusters in Tripura form part of a rural informal economy bringing in their fold small micro-enterprises and home workers. These clusters form labour-intensive sectors and employ marginalized and poorer artisans. Women form a substantial part of it, many being skilled artisans.

CLUSTER DEVELOPMENT PROCESSES: It is important to create good quality clusters as it would lead to agglomeration economies based on bamboo based products. This will allow small firms to access larger markets thereby raising capabilities of workers and producers through income and employment. Such bamboo clusters can enhance capabilities further by strengthening capacity of local firms and reducing their vulnerability to external shocks. Social capital can be critical to this strengthening trust and fostering collaboration. It can also contribute to informal social protection easing the burden on vulnerable groups. The process can however have pitfalls too in terms of widening the gap within the group if only powerful actors like intermediaries and unscrupulous traders control the cluster and is best managed during a cluster's formative stage.

CLUSTER DYNAMICS: Cluster growth creates certain power dynamics within the existing Rural Panchayat leading to development of a critical socio-political scenario. This empowerment of weaker sections is bound to have its own impact within the existing situation. However, in Tripura the tradition of Panchyati Raj has already vested powers to the weaker section in rural areas and certain level of awareness has grown. The process as a result must appreciate this and involve existing local power within in a manner that it does not feel threatened but feels as a partner of the process. Understanding this fact would be crucial for the cluster development process. Even currently in the present system of clusters, many important actors are involved with the local Panchyat system. At the same time, it has to be ensured that the cluster does not become part of the existing Panchyati Raj system. They need to maintain their autonomy of functioning to achieve goals for which they have been created.

CLUSTERS AND THEIR CHARACTERISTICS

Artisans with special skills producing higher volume of value added bamboo products are concentrated in some pockets and a distinct economic sub-sector is being created in these pockets. Certain hubs have been developed over years as centres of bamboo based product trade and meeting market demand over decades.

A word of caution needs to be borne in mind. While going about defining new cluster hubs it will be useful to study experiences of past clusters established and their outcome from an activity, geographical and institutional perspective. The best model for clusters to be defined would need to be based on the high level of involvement and potential noticed in activities being pursued rather than deciding their location arbitrarily.

Clusters noticed from concentration of activity are listed on following page:

District	Cluster	Product
N. Tripura	Kumarghat	Incense stick
	Kailashahar	Incense stick
	Panisagar	Incense stick, umbrella stick, chatai, coarse mat (Durrie)
W. Tripura	Agartala	Handicraft, decorative panels, gift items, fine stick table mats, etc.
	Jogendranagar	Handicraft, decorative panels, gift items, fine stick table mats, etc.
	Majlishpur	Handicraft, fine stick table mats, gift items, fine stick table mats, etc.
	Nalchar:	Handicraft
	Charilam	Handicraft, baskets
	Mohanpur	Handicraft
	Katlamara	Furniture
S.Tripura	Baikhura	Paati, handicraft, mat
	Pilak	Mat, handicraft
	Matabari	Handicraft, vegetable baskets, coarse mat
	Amarpur	Fine stick loom based curtains, long mats
Dhalai	Kamalpur	Mat

PRODUCTS AND CLUSTERS

Bamboo based activities in above mentioned clusters play a very important role in rural Tripura's economy. Main reasons for development of these sub-sectors are:

(a) Traditional availability of skilled workers, (b) Availability of raw material and (c) Existence of local rural market of bamboo-based products. Though there is a market outside the State this is mainly untapped at the current point of time.

These economic activities are specie, skill and product dependent, that has given a direction to clusters in terms of becoming product specific. Bamboo based products of different categories noticed in these clusters were:

a) Intermediate products for industry such as:

- Incense stick
- Coarse mat for board industry
- Packing basket for vegetables, poultry, etc.

b) Products for day-to-day utility for rural life like:

- Coarse mat for fencing and mud houses
- Rural household materials like sieve, material container etc.

c) Finished Bamboo based consumer products as:

- Furniture
- Handicraft
- Furnishing materials, incl. fine stick mats

Depending on availability of skill and bamboo species, product specific clusters have mushroomed. As would be expected, prices of products vary widely depending on market acceptability and value addition in turn depending on product activity pursued. Input cost, mainly bamboo and labour more or less remain uniform and low.

CLUSTERS AND THEIR NATURE

MANUFACTURING & TRADING CLUSTER

There are certain products, which can be manufactured with all varieties of bamboo particularly *Muli* bamboo, the most common found species in Tripura. These products require very low level of skill. Entry barrier to these products is also low for rural households as products are reasonably standardised (from current market perspective) and manufacturing is easy. These products are primarily supply driven and return from these products is very low. Incense stick is one such product. As a result, these products are manufactured in bulk quantity by a large number of households in most parts of Tripura. Concentration can however be noticed in North Tripura Dist., maybe contributed by historical skill and competitiveness in transportation. For these products market demand is continuous and consistent with volumes being high though average returns to

Stick makers line up to weigh and sell sticks to trader at Kumarghat

those involved is very low and is an issue that needs to be addressed.

As indicated earlier, the labour cost for manufacturing these products is less than the daily wage in agriculture and other activity. These products do not generate sufficient income for labour inputs given. As a result, these activities are concentrated upon by marginal workers and few who function as main workers. As a result, mainly weaker members of the household like older people, women

and even children produce these products to add to their earnings. Correspondingly, clusters where these products are traded have evolved as trading hubs. No true production concentration exists for these as it spreads over a region and a number of villages get added to the unorganised production base.

CRAFT CLUSTER

Artisans' clusters have grown due to higher economic returns where artisans can earn more than or equivalent of daily wages from their effort. They produce more value added products for rural household consumption like mats, containers and products for packaging, like basket for vegetables, poultry etc. These products provide reasonable opportunity to women workers as noticed mainly in clusters in West Tripura and South Tripura Districts.

Clusters with value added products like handicraft, blinds, dividers, furniture etc. require a reasonable level of artisanship, and they usually form into artisans clusters. In these clusters, few artisan families play the role of traders along with local traders connecting to markets. Importantly, market for these products is in cities and requires specific marketing effort unlike other products like industrial intermediates or products used for rural households or packaging. Past dealings largely having been conducted by Purbasha has also prevented producers interfacing directly with the market.

This volume based marketing effort of higher skill products results in poor quality material produced by artisans to address needs of achieving volume. With virtually no mechanisation, basic process preparation like grading or treatment of bamboo is also absent and manufacturing of slivers or sticks results in generating poor quality products not satisfying value based needs of buyers.

Linking SHGs to Cluster Facilities

Instead of putting the burden of movement and cartage for raw material and finished goods on SHGs, or forcing them to travel to work to the CFC, a transport based beat system can be organised through the CFC. Under the system the CFC will despatch orders for processed raw material (cut to size and treated as splits, sticks or slivers as need may be) received during the past week on a weekly basis. The van will report to the SHG location on fixed day and time, regardless of order or pick up. This would develop confidence of being serviced by the CFC in the minds of SHG producers. The truck would thus cover 4-5 SHG locations daily as would be practical carrying out raw material from CFC and carrying in finished goods from the SHG production centres.

Payment too could be made for finished goods collected in a manner that quality is checked at the SHG end and 85% of the cash is paid on the spot once finished material is accepted in the manner below. A simple pass book based system could monitor this process that can also factor the purchase of raw material as a debit entry and value of finished goods supplied as a credit.

Value of finished goods:	*Rs. "X"*
Cost of raw material:	*Rs. "Y"*
Payout Basis:	*85% of Rs. "X" – Rs. "Y", balance paid on next trip*

The entire logistics and QC responsibility can be outsourced to a CDA willing to assume a larger responsibility for improved returns.

MARKET INTERFACE

These clusters are unorganised and fragmented with artisans concentrated in a close geographic area. Majority of artisan sell their products to small traders who supply to different markets selling low cost products. Artisan families

demonstrating more entrepreneurial abilities with closer links to large city markets earn more given better understanding of design and markets. Such enterprises are seen mostly in West Tripura District.

Role of Purbasha and Expectations

The Tripura Handloom and Handicrafts Development Corporation Ltd. venture Purbasha has contributed to giving a definite direction to artisans of these clusters for better product quality and price. Purbasha is the single largest purchaser of quality materials in reasonable quantity in Tripura. In 2004-05, they sold handicrafts worth nearly Rs.125 lakh, over 98% of which were bamboo based. As an estimate, total Tripura market of handicraft has been estimated at over Rs. 1,500 lakh. Prices of most products are guided by Purbasha price, i.e. in many products the traders pay 5% to 20% less than Purabasha's price by booking material with little advance or by paying cash. Purbasha purchases the materials from these clusters on credit terms and has of late been slow in making payments.

Screen manufacture in progress at East Aralia

Considering reach of Purbasha within Tripura and in external markets, its restructuring must be considered to play a productive role in a new form emerging from reduced manpower costs and change in its operational ability. Marketing arrangements could be entered into by cluster organisations with Purbasha at discounted rates based on 2 conditions to be met:

1. Dedicated shelf space and display in its showrooms
2. Cash based purchase for goods contracted

Since there is no industry of consequential size, no large organised buyers can be found because of which these clusters have remained fragmented and unorganised. If buyers can be exposed to capability at the grassroots and reassured of delivery due to functioning of PrIA there is every reason to believe that independent market mechanisms will come in to play and must be encouraged.

GoT BASED CLUSTER DEVELOPMENT INITIATIVES

Formation of these cooperatives took place with government initiative and these cooperatives usually have nine members on the Board, six from community usually from six separate SHGs, one is government appointed and paid for the task, one hails from Co-operative Department and one the Bank. The key person in this system is the government appointed member designated as the Cluster Managing Director.

These cooperatives have failed to play the role as a nucleus of cluster growth and remained a small uneconomical entity mainly used to channel supplies to Purbasha. Some cooperatives do as little annual sales of Rs. 35,000/- only. Their failure becomes glaring from the fact that cumulative sales to Purbasha are less

than 20% of Purbasha's total purchase of handicrafts. Purbasha procures balance 80% from artisans present in clusters other than co-operatives.

The Govt. based cluster development initiative has been directed at formation of women's co-operative in these clusters. These co-operatives are:

No.	Name of Cooperative	Name of Cluster	Block/District
1.	Maa Teressa Mahila Hasta Karu Shilpa Samabay Samity	Agartala Handicrafts	Sadar, W. Tripura
2.	Pritilata Mahila Hasta Karu Shilpa Samabay Samity	Jogendranagar Handicrafts	Dukli, W.Tripura
3.	Matangini Mahila Hasta Karu Shilpa Samabay Samity	Charilam Handicrafts	Bishalgarh, W.Tripura
4.	Nalchar Women Hasta Karu Shilpa Samabay Samity	Nalchar Handicrafts	Melagarh, W. Tripura
5.	Nivedita Mahila Hasta Karu Shilpa Samabay Samity	Majlispur Handicrafts	Jirani, W.Tripura
6.	Mohanpur Mahila Hasta Karu Shilpa Samabay Samity	Mohanpur Handicrafts	Mohanpur, W.Tripura
7.	Gomati Women Hasta Karu Shilpa Samabay Samity Ltd	Amarpur Handicrafts	Amarpur, S.Tripura
8.	Baikhora Mahila Pati Shilpa Seva Samabay Samity Ltd	Baikhora Handicrafts	Bagafa, S.Tripura
9.	Tripura Sundari Mahila Hasta Karu Shilpa Samabay Samity Ltd	Matabari Handicrafts	Matabari, S.Tripura
10.	Panisagar Mahila Hasta Karu Shilpa Samabay Samity Ltd	Panisagar Handicrafts	Panisagar, N.Tripura

As can be noticed, aspects of organic growth of clusters in Tripura have not been of much consequence though potential exists to form a basis for the future based on individual needs noticed.

Problems of Existing Clusters

The main problems of these clusters as identified are:

- Highly unorganised and age-old traditional nature of this craft is less remunerative to member households and over the years is making this kind of activity less viable.
- Lack of use of technology for production of intermediate products like bamboo slivers, sticks etc. has resulted in poor product quality as well as low productivity.
- Absence of meaningful capital in clusters has affected growth.
- Clusters are poorly linked with main markets because of which artisans lack an idea about market demand, pricing and requirement.
- In most West Tripura district clusters, cost of bamboo is high with artisans being forced to buy it from the open market given lack of accessible resource.
- Many development initiatives are based more on external compulsions than on actual requirement of artisans. These compulsions could be socio-political or related to specific subsidy for specific areas and nothing to do with cluster development from a production or market perspective. As an example, the CFC created in Killa in Sept. 2005 is highly underutilised and mostly run by officials of the Forest Dept. The local Jamatia community is less interested in Bamboo based crafts as it is of poor economic consequence. On the other hand, Tapania village of Matabari cluster or Karimura Village of Charilam cluster would have made good use of such a CFC given regular economic activity reported. Majority of artisans are from Bengali communities, in particular from "Namo" community and most profitable clusters are dominated by them but facilities have been created in tribal areas for reasons other than viability.

- Lack of encouragement from institutions for market driven entrepreneurial activity has resulted in not a single CFC being found to be existing on the basis of collective effort of cluster-based entrepreneurs.

All above problems can be partly or fully addressed with help of a broad common platform of artisans within clusters. Lack of common platform due to poor collaborative interaction amongst artisans causes problems like poor access to market, capital (though number of SHGs are present in their early stages), and high cost of raw materials. Establishment of entrepreneur driven production facilities leading to organised production can be another approach that can drive the sector with a higher level of risk and responsibility being undertaken to meet efficiency needs.

Importantly, majority of artisans are not willing to be part of the initiative due to:

- Being predominantly women's cooperative, it limits involvement of men.
- Average artisans have potential to do much more business than being part of the Co-operative.
- Many have become members only to get a share of the order routed by Purbasha.
- Apart from imparting routine training, these co-operatives have failed to consolidate as a larger economic entity.
- These Co-operatives provide very few common facilities related to technical, financial, procurement, marketing to local artisans.
- Successful entrepreneurs do not participate actively in clusters.
- Though these institutions are independent, they are situated within certain Gram Panchayats who influence Co-operative's decision-making process.

A suitable solution could be to revamp these clusters and link them to BCDI under its restructuring process. However the ownership of bodies resting with central and state governments, viability of this will need to be studied that may be addressed while carrying out the detailed study on BCDI revamp. Aspects of membership and ownership will need to be addressed to arrive at the proposed solution. Also needing to be addressed will be criteria of existing physical location and consequential viability to take a decision on sound business principles. This option may be considered since left the way they are these clusters are hardly meeting any objective, commercial or social.

Cluster Institution Structure – An Approach

A partnership based cluster development structure as suggested below could be an approach suited in certain clusters. For one it depends on an entrepreneur coming forth to co-invest in the cluster that will take the shape of a business entity with a proposed equity structure as below:

SHAREHOLDER	Stage I		Stage II		Stage III
o Entrepreneur	51%		→		(51-74%)
o PrIA	26%	→	23%	→	0%
o Community through SHGs	23%	→	26%	→	(26-49%)

Under this mechanism the entrepreneur will have operational rights giving them the freedom to function in a competitive environment within a framework defined through the Memorandum & Articles. Any changes to be brought in this structure will need approval of PrIA in the first three years and by community shareholders in the period after that as holders of 26% equity.

Should the community members not have finances to subscribe to equity, PrIA could contribute upfront to equity on their behalf to be adjusted against outputs generated by SHGs over time. The shares would be held in custody by PrIA for such period of time to be adjusted against wages/profit progressively. In any case PrIA will divest in favour of community shareholder and entrepreneur around the time of completion of PrIA's responsibility with the project. Should the unit not be stable by then, the equity will be transferred to the SPV formed for divesting in favour of existing stakeholders when a suitable maturity point is reached. Final transfer split ratio between entrepreneur and community SHGs would depend on importance/finances required for future plans of unit.

Since start up support in terms of facilities and funds would be extended to such units, special reporting requirements and other compliance procedures could be spelt out in the M&A drawn up. This step will clearly identify key decisions that need ¾ of majority to approve making the 26% holding important to approve such decisions.

In this manner three aspects will be covered judiciously: (i) The unit will be able to meet expectations of the market, (ii) SHGs will be able to form part of ownership, and (iii) A watchdog oversight structure will be able to function effectively, first by PrIA and later by SHG shareholders.

CAPACITY BUILDING

CAPACITY BUILDING

Given the fact that resource and markets prima facie do not pose themselves as a major obstruction to plans drawn up, addressing aspects of human ability assume much importance. The ability of a pair of Tripura hands to work on bamboo can be rated as being among the best in the country. This now needs to be extended to developing an understanding of what markets need and impart skills to work through an organised production system meeting volume and quality needs of the market. It is also very important to kindle the entrepreneurial spirit and it has been heartening to note the recent surge in number of entrepreneurs that was rare to find in the past. Given the keenness and resilience of the people of Tripura this is eminently doable and will need the support of an ongoing and intensive capacity building program.

The program will direct efforts at not only improving manufacturing skills but will also need to cover areas of entrepreneurship development, understanding of markets, functional literacy and other identified needs to work together in an organised fashion. Once these aspects are understood and internalised, output from the system will reflect the deeper understanding of market needs and will help strengthen aspects of commitment. Of course, to achieve all this it will not only take an extended effort at "hand holding" but also need to involve the community in terms of equity, addressing issues of ownership and returns. Without this, the complex mechanism that the project hopes to weave will not be achievable.

Trainee at work on a bamboo splitter at Don Bosco Training Centre

Specific areas that will need to be addressed will be design, organised production, machinery/tool working, financial management, and quality assurance. This will be one of the primary functions of the institutions created and will need to be pursued on an ongoing basis. Improved understanding of markets through exposure trips and participation in workshops and fairs will need to be planned. Also to be considered will be the linkage of production to training. Fortunately, there are many such initiatives underway as part of government efforts and linkages must be created to maximise benefit available on offer.

Two units were visited that have potential to turn into Training Centres. The first one at Bishramganj in South Tripura was an excellent example of a facility that was being put to productive use outside the government managed system. Not only has the institution obtained an entire set of bamboo working machinery but have even deputed a technically qualified professional for maintenance of equipment and developed a training schedule that various beneficiaries could be seen availing of. A centre such as this can easily be linked to efforts of the Tripura Bamboo Mission as a training cum job work centre being able to contribute on an immediate basis. This hypothesis was cross checked with an established handicraft manufacture located at Nalcher not far away. This manufacturer does business with retailers and wholesalers in various cities of the country but is largely using manual inputs. On checking whether they would use a facility within ½ hour distance away on job work basis they were keen to work through such an arrangement.

The second location visited was the newly established CFC at Killa in South Tripura where running activity was not noticed though it had several machineries installed. Manual work of a good skill level could be noticed though and the producers would have definitely gained if the equipment installed could be integrated into the process requirement of community workers. The CFC would also need to be supported for its marketing effort to promote its output and such a function would be best achieved by an organisation tuned to commercial understanding of markets. PrIA could build this capability internally as well.

Newly functional CFC at Killa

A third CFC viewed at Panisagar and the only one in North Tripura had not been put to effective use in the last six years. The CFC had been positioned to meet needs of handloom weavers but since year 2000 there had been no major training efforts. Considering the hub of incense stick trading is close to such a location one of the things can be done in the immediate context would be convert this facility into a unit to help manufacturer of incense sticks. However many more elements will need to go into making this a complete offer and integrating it to meet needs of producers.

Yet another large facility also with CBTC's technical help as done in Killa is being established at Kowaifung and this is at a stage of establishment. It would be very important for all such facilities being established to ensure that they are not merely a congregation of buildings and equipment but one that stimulate production with revolving market involvement.

A full scale training facility such as a revamped BCDI is needed to function at Agartala reflecting Tripura's new found ability in the sector. This facility needs to have installed machineries as are needed to undertake various processes and will also manage the overall training commitment of cluster capacity development. As has been mentioned, the training centre should allow its facilities to be used for

those willing to pay for it as a job work facility that will also offer opportunities for trainees to serve as an apprentice before moving to a job in the field.

This can be done by collaborating with BCDI under a suitable PPP format. It would be useful to involve machinery manufacturers with such a training- production-demonstration centre in some manner.

NEED FOR ENTREPRENEURSHIP DEVELOPMENT PROGRAMS

Craftsperson's ability to produce good quality products through application of fine skills needs to be strengthened through honing their business skills. To achieve this it is important to identify potential entrepreneurs and groom them for responsibilities ahead. At the same time stakeholders need improved exposure to buyers, industrial units and consumers to help them understand needs and constraints beyond their own. CDAs and BDS providers too need to be exposed to improved business skills and will need ongoing training. This role will need to be performed by PrIA utilising services of external experts/agencies through a departmental approach that is modular improving on the learning process.

It must also be recognised that every good artisan may not have the potential to turn into a successful business person and for this reason efforts must be tuned to needs of the project and a rigid selection process carried out. As an example, functional literacy must be taught to all artisans involved making them aware of commercial dealings and freeing them from the burden on depending on others for basic needs. However, only a few who demonstrate an ability to manage a commercial activity need to be given basic training. Their performance will then need to be observed and if found satisfactory, higher business development skills will need to be inculcated through further capacity development.

Other than artisans, SHGs and cluster managers, needs of staff of various departments and institutions involved with the project need to be addressed through a combination of improved measures such as exposure visits to events and locations, awareness building, interaction and training outside the project domain. Details of these components can be found in Annexure H.

CLUSTER WISE CAPACITY BUILDING ACTIVITIES

Cluster	*Product*	*Capacity Building Intervention*
Kumarghat	Incense stick	• Formation of SHGs • Training related to quality and grading • Training related to stick rolling • Training for using machines
Kailashahar	Incense stick	• Creation of a CFC is necessary for incense stick making. • Formation of SHGs • Training related to quality and grading • Training related to stick rolling • Training for using machines
Panisagar	Incense stick, umbrella stick, chatai, coarse mat (Durrie)	• Formation of SHGs • Training related to quality and grading • Training related to stick rolling • Training for using machines
Agartala	Handicraft, decorative panels, gift items, fine stick table mats, etc.	• Workshop related to marketing • Exposure visit to market through fairs. • Training on design to Master Craftsman • Training to the artisans • Workshop on managing micro business

Jogendranagar	Handicraft, decorative panels, gift items, fine stick table mats, etc.	• Workshop related to marketing • Training on preparation of finer blinds through looms as per the requirement of the market. • Training on design to Master Craftsman • Training to artisans • Training to entrepreneurs for managing micro business
Majlishpur	Handicraft, fine stick table mats, gift items, fine stick table mats, etc.	• Workshop related to marketing • Workshop related to design • Exposure visit to market through fairs. • Training on preparation of finer mats and handicraft. • Training to artisans related to mechanization • Training to entrepreneurs for managing micro business
Nalchar	Handicraft, Large Mats, Utility items	• Training to SHGs for capacity Building • Exposure visit to market through fairs. • Training on design to Master Craftsman • Training to artisans • Training to entrepreneurs for managing micro business
Charilam	Handicraft, baskets	• Training to SHGs for capacity building • Training to artisans on using jigs for standardised production • Training to entrepreneurs for managing micro business
Katlamara	Furniture	• Workshop related to marketing • Exposure visit to large furniture shops in metros • CFC needs to improve utilisation with planned machines. • Design training • Training to artisans • Training to entrepreneurs for managing micro business • Training related to plantation.
Baikhura	Pati*, handicraft, mat	• Establishing Linkages with market • Training on design to Master Craftsman related to fine mats. • Training to the artisans • Training to entrepreneurs for managing micro business
Matabari	Handicraft, vegetable baskets, coarse mat	• Creation of a CFC is necessary particularly for mat making. • Workshop related to running SHGs • Training to artisans for mats • Training to entrepreneurs for managing micro business • Linking financial institutions with SHGs
Amarpur	Fine stick loom based curtains, long mats	• Workshop related to running SHGs • Linking financial institutions with SHGs • Training on preparation of finer blinds through looms as per the requirement of the market. • Training on design to Master Craftsman • Training to manage micro business

TECHNOLOGY

TECHNOLOGY NEEDS

Considering most interventions are not likely to utilise high technology inputs for achieving production and given NMBA's expertise and experience they should be partnered with to be part of the Mission. Given their funding and technology support ability NMBA would be best placed to recommend appropriate technologies looking to location and needs as also address and keep the mission abreast for its R&D needs. It is for this reason that this report does not take a prescriptive role though information has been provided in the report. Looking to the manual and automated options available, actual deployment will largely depend on actual field location and scale proposed. Existing units may also be upgraded under the program should they show willingness and PrIA is able to see potential in such an effort.

NMBA has encouraged machinery manufacturers to develop and adapt technologies crucial to the bamboo sector and is constantly working at offering improved technology options. Considering scale of order for machineries to be supplied, the supplier of such machineries must be encouraged to establish workshop based facilities in Agartala with at least a representative located in North Tripura. As discussed elsewhere, their involvement with BCDI in Agartala may also merit consideration.

In early stages of any sector's growth role of demonstrative induction assumes great importance. Considering NMBA's proposed role as a partner in the TBM project and looking to their contribution in development of bamboo technology at a national scale, this approach of demonstrative induction must be pursued. It will not only help prove the utility of approach presented but will further encourage entry of entrepreneurs to take up activities on a commercial basis.

Based on discussions with NMBA, presented below is a brief overview of technology requirement for product areas decided. A detailed list in has been attached as Annexure E with list of vendors covered under Annexure F.

TECHNOLOGY NEEDS

MATS

For mats it would be better to run a collection mechanism on manual production basis focusing on improving quality from a process perspective. This given the fact that unless 150-200 workers can get together to work from a location it may not be viable to justify an investment of Rs. 25 lakhs or so towards setting up of a mechanised slivering unit consisting of operations such as Cross Cutting, Splitting, Internal knot and outer skin removing, thick slivering and thin slivering (0.6-0.9 mm).

Considering the number of poles to be worked on at a given point of time it is quite feasible to use a hacksaw and *Dhao* for carrying out these operations. Quality of tools used including tips and sharpening mechanisms could be focussed on. The first step to mechanisation could be the installation of a ERG type manual slicer or the electrically run Slicing Machine costing Rs. 45,000 that can deliver 10-12 slices a minute. An overall viable cost set for this would be Rs. 1.5 lakh given the need for 2 manual splitters, 1 Slicing machine and 2 Slivering machines to reduce thickness to desired level.

All this may however undergo a change if the imported mat weaving machines perform well (see page 20) and can be successfully integrated with a manual primary processing production system feeding the imported slivering and mat weaving machine.

STICKS

For sticks, the unit as supported by NMBA in Manipur could become a viable basis particularly for mixed products of square sticks (for incense stick making) and round sticks for Blinds where mechanised sticks are the only solution. Waste utilisation in terms of pelletisation/briquetting of dust and scraps, and charcoaling of round form of waste would have to be incorporated to improve viability of the unit. Similarly areas where power supply is not available, incense stick production can be managed by individual families with hand fixtures developed by ERG. This could be supported by a central facility for slicing, tool grinding, stick polishing as well as collection mechanism for sticks.

These efforts can deliver square sticks of superior variety helping upgrade final product quality and value in the market. Along with square and round stick, produced manually or mechanically, down stream usage in rolled stick production and blind making would enhance value addition of entire chain of stick production and bringing increased income level to families.

FURNITURE

For furniture sub-sector it would be best to upgrade production facility in existing units through appropriate line balanced production mechanisation for volume production. An investment of Rs. 25-30 lakhs towards treatment facility, small cross cutter, hand splitter, sanding/ polishing, drilling, step cutting and bending machines with equipment like spraying, blow torch, etc, would form the set of mechanisation to be organised. A capacity balanced production layout with proper activity/manpower organisation will need to be positioned based on organisation needs. Marketing tie up with raw material sourcing of appropriate mix of species preferably with FSC certification would provide additional production and market strength to improve viability of units.

HANDICRAFTS

For handicrafts it may be best to work at a tooling level till such time that a long term and large committed order from a buyer can be seen on the horizon and firmed up. Such utility handicrafts comprising Hangers, Baskets, Planters, Placemats, Coasters, etc. will need to work in a more organised production-process flow mode and quality aware manner leading to subsequent/gradual mechanisation of individual process segment. More than machinery, skill development and tools that help address design expectations of the market will go a long way to improve output from the sector. The role of a designer on a constant basis needs to be stressed who can look to constraints in the field, yet work out high quality designs that can be produced in volumes consistently.

Something that needs to be borne in mind is the size and demand of the market that requires large numbers of standardised products to be produced in less time. While production technologies have a role to play, the role of a consolidator who can coordinate with many units and take a position in the market needs to be stressed.

CREDIT & FINANCING

CREDIT & FINANCING

CREDIT STATUS

Tripura can not be considered an industrially developed state and the most often cited reason for this is lack of accessibility to finance. While this is true of all North-eastern states, Tripura is more handicapped by its isolation from the rest of India, surrounded as it is on three sides by Bangladesh. There is no railway link to the state and that too has hampered industrial progress.

The state has got adequate banking network to support its entrepreneurs having a total of 226 bank branches, 180 of them being branches in rural and semi-urban areas. Most public sector banks have a presence in the state, with United Bank of India (UBI) being the Lead Banker. Out of 226 bank branches, commercial banks have 94 branches, with UBI and SBI accounting for 41 and 33 branches respectively. Financial Institutions like NABARD, SIDBI, NEDFi are also functioning in the state however, the new generation private sector banks like ICICI, IDBI and HDFC banks are not yet present in the state. Tripura Gramin Bank (TGB), Regional Rural Bank, promoted by UBI, has got maximum number of branches at 87, in addition to having 11 extension counters in the state.

The state had deposits of Rs. 3,229 crore and advances of Rs. 1,106 crore on December 31, 2005. The Credit:Deposit Ratio (CD Ratio) for the state thus worked out to be 34 as on December 31, 2005. While this ratio is quite low compared to economically developed states like Tamil Nadu (98) and Maharashtra (95), it is also lower than Assam (35), Mizoram (51), and Manipur (41).

Out of approx. Rs. 1,106 crore of advances in the state, TGB accounted for as much as Rs. 325 crore, clearly being the leader in the state banking sector. Two other major players are State Bank of India and United Bank of India which have credit outstanding of around Rs. 275 crore and Rs. 170 crore respectively. The priority sector credit accounted for 66 % of total advances at Rs. 727 crore. However, within the priority sector, industry accounted for only 81 crore, being 11 % of priority sector credit and only 7 % of total advances. The services sector had the largest share at around Rs. 450 crore. Of the Annual Credit Plan of Rs. 333 crore for 2005-06, the overall achievement till December 2005, was 88 %, but the achievement in SSI sector was only 52 %, at Rs. 16 crore. It underlines lack of industrial development in the state with SIDBI and NEDFi too having little credit exposure in the state.

Our interaction with bankers, however, reveals that more than availability of credit, the issue is of suitability of entrepreneurs for formal credit channels. The shocking credit recovery rate at 25 % as on December 31, 2005, in the state further dissuades bankers. The recovery rate was lower at 22 % in December, 2004 and these are all big road blocks for expansion of credit facilities in the state.

Coming to bamboo sector in particular, most entrepreneurs do not have the capacity to avail bank credit as they have little to show in terms of net worth and are not in a position to put in stipulated promoter's contribution. There is also general lack of entrepreneurial culture in the state and most economic activities are state driven.

If one looks at range of incentives available in the state for entrepreneurs, it is clear that lack of credit availability should not come in the way of entrepreneurs.

Major incentives available are:

State package of incentives

1. Capital Investment Subsidy @ 30 % on Fixed Capital investment, subject to a ceiling of Rs. 30 lakhs per unit.

2. Interest subsidy of 4 % on term loans, for 5 years, subject to a ceiling of Rs. 30,000 per annum per unit
3. Reimbursement of state sales tax for 5 years

Central package of incentives

1. Capital Investment subsidy @ 15 % of investment in plant and machinery, subject to a ceiling of Rs. 30 lakhs
2. Interest subsidy of 3 % on working capital loans
3. Reimbursement of 100 % excise duty for 10 years
4. Central Transport subsidy of 90 % on transport costs
5. Grant-in-aid on setting up of horticulture-based industries (fruit processing) upto Rs. 4 crore and on other food processing industries upto Rs. 75 lakhs (33.33% of capital cost)

Given the range of incentives available to the entrepreneurs in the state, the entrepreneurs should not find credit as an obstacle. However reality points to lack of access to credit as indicated at the stakeholder meeting. Most such incentives though would be available to the organised sector, while almost all the entrepreneurs working in the bamboo sector belong to the unorganized sector, essentially being small artisans working from homes preventing their availing such facilities.

In the circumstances, the option of informal credit channels seems most likely to succeed. However, even informal credit channels are not developed in the state with no major Micro Financial Institutions (MFIs) present in the state. TGB is also the lead player in micro finance sector with linkages to around 12,000 SHGs, out of which only 2,000 have been provided credit. The credit linkage is thus quite weak. Outstanding credit of TGB in the micro finance sector is only around Rs. 10 crore.

The potential to apply micro finance in the state is however much larger. During field visits it was seen that there are many SHGs who are in operation for more than two years but have not availed bank credit. What came through clearly was need of capacity building of groups as most of these SHGs had nobody who could approach banks with a business plan.

CREDIT PLAN

As usual, the credit plan for the state would need to address both demand and supply side issues to be effective. However, in the case of Tripura the demand side needs more care.

Demand Side

Artisans working with bamboo products need to be made credit worthy. The credit plan would here mainly amount to an intensive capacity building initiative which should first select SHGs who are ripe for credit intervention. These SHGs would be helped in formulation of a suitable business plan and then approach banks like TGB, SBI and UBI, all of whom are engaged in micro finance.

One of the options that can be tried is setting up of a series of Common Facility Centre (CFC), each with basic machinery and with raw material stocks (e.g. sticks, yarn) which would be used by workers of neighbouring areas. The CFC would need to be located in the centre of clusters present in the state. CFCs would also need to be developed into nodal points for not only capacity building initiatives (training etc.), but also common procurement of raw materials and marketing of products. The banks which are hesitant to lend to individuals are more likely to come forward and provide credit for CFCs on the strength of groups.

Supply Side

The supply side of credit can be addressed through efforts directed at sensitization and orientation programme for banks like TGB, SBI and UBI. Also, there is need for Micro Finance Institutions (MFIs) to play a big role in the state. For the purpose, major MFIs of the country would have to be contacted and apprised about the potential of micro finance in the state. Some of them may be then be willing to start their operations which would address the micro finance needs as well as capacity building needs of the sector. Rashtriya Gramin Vikas Nidhi (RGVN) is one such institution with an exposure and track record in the north east region and they may be contacted to commence the process. Initial discussions held with them have pointed to their keenness to be involved. Other MFIs having experience and track record in grassroots lending and livelihood finance may also be considered for the task.

Project Funding

Based on a needs assessment of the project a comprehensive budget has been presented as Annexure A. The Government of Tripura will extend financing to the tune of Rs. 8 crore for the entire 3 year mission term. Beyond this it should be the responsibility of the implementing agency being appinted to raise finances to meet needs indicated in the budget. While funders have been identified as below, allocations have not been done looking to individual needs of each activity that will become clear after a DPR. It may be borne in mind that looking to the socio-economic and environmental considerations associated with the project many donor agencies could be tapped for funding. Initial agencies identified are:

- Govt. of India Central Schemes
- Govt. of Tripura (Incl. SGSY Project sanctioned)
- Development Commissioner Handicrafts
- National Mission on Bamboo Applications
- International Finance Corporation
- Ford Foundation
- Other multi-lateral funding agencies
- Commercial Banks
- Development Banks such as NABARD, SIDBI
- Micro Finance Institutions such as RGVN
- Promoter Equity

IMPLEMENTATION STEPS

IMPLEMENTATION STEPS

Looking to needs of the project, this section attempts to list down series of activities that could be taken up on short term (Phase I) and long term (Phase II) basis. An indicative timeline for Activity to be pursued in Year 1 is shown in Annexure D. While overall planning will be one of first tasks to be carried out by the Project Implementation Agency this section helps give an overview of task at hand. Phase I efforts will be directed at addressing needs of preparation and taking advantage of immediate opportunities that can be quickly capitalised upon for benefit of people of Tripura. This will also be the phase where past efforts will need to be consolidated and built upon to establish early success to develop confidence in the system. Phase II efforts will address needs of scalability to achieve the final goals of Tripura Bamboo Mission.

PHASE I

Following activities will need to be pursued as part of Phase I:

- Acceptance of TBM Strategy Report after necessary discussions and release of mobilisation funds to initiate project process.
- Formation of Project Implementation Agency (PrIA) and addressing areas of mandate and staffing. It will be important to define agencies and professionals that can play a key role in the Mission's plans and seek a mechanism of their involvement in the management group. As suggested this would be best addressed through the formation of a constituted body such as PrIA that would be best suited to perform such a role.
- Looking to needs of the Mission the structure of PrIA must be drawn up with a high level of field and market orientated staff established as a strong team at Agartala. The team will need to function in a business development mode to achieve project goals. As suggested, a field officer must be based in North and South Tripura to hasten implementation needs. They will need to be supported by a talented pool of specialists to be involved with the Mission in areas such as markets, technology, design, capacity development. A roster of external experts will need to be developed that can be called upon as need arises.
- Sensitisation of government departments and outlining of their role especially for policy related needs will need to be carried out to ensure support for the program. Strong linkages with departments within GoT will need to be established particularly with departments such as Industries, Forest, and Rural Development, to name the important few.
- Meetings with central government departments and institutions located outside Tripura but central to Mission's plans will need to be initiated and support enlisted. In particular the issue of plantation of alternate species needed for livelihood activities as planned under Mission's plans needs to be taken up urgently to catch the 2006 plantation program.
- An inventory of government schemes in the pipeline and those that become eligible to be tapped for Mission's needs must be drawn up and efforts initiated to develop proposals and present to agencies concerned.
- Specific efforts need to be initiated to help Purbasha and BCDI evolve as more efficient institutions, closer to current day needs and in line with goals of the Mission. While it is recognised that both are independent institutions, their coming on board the Mission program can be mutually beneficial. In immediate terms, it could help meet their business interest needs as service providers and work towards an overall arrangement to help strengthen the institutions in the long term.

- Discussions must be initiated with financing institutions located in Tripura to sensitise them on one hand and seek support to Mission's plans. Thereafter special line of credit as a package if possible must be agreed upon to fast track investment needs from field based operatives.
- Various business groups that have expressed interest to invest in the state must be invited for a combined exposure visit followed up with specific individual negotiations to develop an understanding of interest expressed and needs emerging.
- All players who are involved with economic activity using bamboo in Tripura must be got together for a more detailed understanding of needs and problems and more importantly to assess appetite to pursue higher growth goals.
- A detailed assessment of forestry resources around identified clusters would need to be carried out is conjunction with the forest department. Any projects in the pipeline addressing this need may be established contact with to request access to such information.
- Consolidated documentation of all past work done under the "Olom" program including designs to serve as a ready reference for future efforts. Issues concerning use of brand name if any will also need to be addressed.
- Establishment of CFC must be considered to carry out mechanised incense stick production activity at Kailashahar/Kumarghat to meet upgraded product needs of incense stick manufacturers including improving on utilisation of existing CFCs. Support for such an effort could come from DCH initiatives announced. On a separate count few operational units could be upgraded to produce square sticks for which tools and jigs can be procured from NMBA and market supply line and feedback could be gathered to pave the way for a larger rollout in Phase II.
- Establishment of CFC facility at Charilam (Karimura), Matabari (Tipania), or Nalchar to produce slivers for mats to meet needs of weaving clusters to a level of 1000 mats/day. This would need roughly 250-300 weavers to turn out the required quantity at a production ability of 3-4 mats per day given the fact that uniform slivers can be supplied to facilitate their process, helping meet quality needs of mat manufacturing units who have complained about poor quality. This level of production would ensure a truckload of mats being despatched from one location every 3-4 days that can be tied up between 2 buyers. The purpose of such an effort will be to position a pilot effort and learn from it. It will also help in confidence building on both sides. If all goes well this can then be scaled up in Phase II.
- Giving a commercial direction to CFC facilities to be established. This will be done through strategic initiatives directed towards market linkages and improved production planning. Even linking existing producers of handicrafts and fine stick mats to utilise facilities of such units by developing an understanding of needs can get things rolling quickly.
- Blind manufacturers in Guwahati and other locations can use sticks if produced regularly to a good quality specification. A few additional machines installed within existing facilities can start turning out these sticks given the fact that all other equipment stands installed.
- With abundant availability of biomass and the need to provide power to locations not reachable otherwise, installation of "Bamboo Gassifier" as supported by the National Mission on Bamboo Applications (NMBA), Department of Science & Technology could be considered. One possible

approach could be to have a community owned facility based on successful models as carried out in West Bengal.

- A bamboo shoot collection system at the field level could be pursued to be established with a tie up to the packaging unit established in Agartala could show quick results. This can later be scaled up by inviting an entrepreneur to establish a unit in Tripura.
- Efforts should be made to invite entrepreneurship development agencies to carry out capacity building efforts. Capacity building efforts need to also be carried out for all involved with the production system as an ongoing program in technical and business terms.
- Cluster units indicated could also be used to pilot an effort at creating intermediate slats of varying lengths of 2' to 4' in width of 1 and 2 cms. If these can be treated, finished well and packed in lots of 100/200 they could be test marketed for customised uses as needed by designers, creators, furniture makers and others in distant metro locations.
- Considering the nascent stage of the sector, it would in any case be worthwhile to set up pilot units that can be operationalised through an entrepreneurial partnership approach if possibilities exist. These could cover items such as charcoal, mouldings, or even bamboo shoots packaging as a low cost facility allowing packaging for consumption in a short duration of time in a local area. It would also be suitable if a few demonstration structures of prefabricated material are installed to familiarise people with such technology options. To this end the support of NMBA may be sought to further this agenda leading to further replication possibilities.

PHASE II

It is not that this phase will commence on a linear basis after completion of Phase I. It would be more appropriate to state that outputs of this phase will become more visible once Phase I activities have established confidence in the minds of the people. Efforts towards this would have commenced in parallel more in terms of groundwork preparation.

This will also be the stage by when the institutional structure will have positioned itself in full to address the scaled up needs of Tripura Bamboo Mission. Phase II will be an industrial process based approach with market linked arrangement executed through institutional structure as indicated below.

Major activities to be pursued under this phase would be:

- Positioning and strengthening of emerging institutional structure with linkage to markets, capacity building, resource, credit and policy related efforts.
- Building awareness on Mission goals and ensuring wide support within and outside the state of Tripura.
- Developing a process based cluster level production model for each product line identified.
- Establishment of clusters chosen from resource, ability and market suitability perspective for following sectors. The process will entail addressing integrated needs of the sector from resource to return realisation on continual basis.
- Focusing of efforts on incense stick production in raw and rolled form, with possible branding through introduction of mechanisation and volume production.

- Production of quality standardised sticks through mechanisation on running basis with stocks being maintained closer to market points to meet needs of blinds manufacture or an intermediate for customised use.
- Organised mat production to capture substantial chunk of market for supply to board manufacturers other than pursuing decorative applications.
- Developing 3-4 manufacturers for making knockdown furniture to meet national market needs.
- Establishment of a few bamboo shoot collection and packaging facilities with value addition product line.
- Development of utility handicraft products from fine stick mats, baskets, slats and poles produced in volumes to meet needs of bulk distribution and marketing. Once this has been addressed and volume outputs are feasible, look to developing export markets.
- Contracted arrangement for buying institutions with linkage to design input and contracted buying arrangement.
- Replication of other opportunities presented by utilising bamboo resource such as gassifier installations, charcoal manufacture, subject to its meeting criteria established.
- Inviting investment and helping in establishment of industries on individual/partnership basis for product lines identified.
- Identify and launch focused initiatives directed at possible problem areas. Eg. Develop a package for transportation that does not create additional burden on exchequer and seems practical to use than current subsidy scheme which is shied away from.
- Once above initiatives find firm footing other approaches can be practiced. One such could be infrastructure development utilising bamboo resource for its structural ability converted through human potential into product systems helping address needs of construction, water, and energy.