

Proceedings

Symposium

on

Bamboo Perspectives in Mizoram and the Northeast

Aijal Club, City Centre, B-69, Aizawl, Mizoram, 25 October 2016



Ministry of
Development of
North Eastern
Region



International Network for Bamboo and Rattan
Indo-German Project Climate Change Adaption in the North Eastern Region
Mizoram Department of Environment and Forests

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1. Introduction

In Indian mythology there is a belief that there existed a tree known as *Kalpavriksha* which was capable of fulfilling the wish of someone who stood below it and every part of the tree was useful for the people. Just as coconut has multiple uses for the people in the south, bamboo is the *Kalpavriksha* for the people of the north-eastern region. There is nothing of bamboo which can be discarded as waste and every farmer either in the hills or the plains of the North East cannot be without a few clumps of bamboo on his land.

Bamboo is an important part of the sociocultural and economic life and essential part of the natural environment in the North East. This holds in particular true for Mizoram, which is the leading state with 226 km² area of pure bamboo and planned to be developed as the "Bamboo state of the country" as announced by the Union Ministry of Development of North Eastern Region (MoDoNER) and the Government of Mizoram in September 2015.

Within the frame of the GIZ/MoDoNER Project Climate Change Adaption in the North Eastern Region (CCA-NER), the latter commissioned the International Network for Bamboo and Rattan (INBAR) to undertake a "Study on the Bamboo Sector in Northeast India and Entry Points for Development in Mizoram State".

Informing and discussing the results of this study has been one of the objectives of the symposium, which was organized by INBAR, CCA-NER and the Mizoram Department of Environment and Forests.

2. Objectives and Agenda

The final agenda of the symposium is attached to the annex. Outlined as a 2-day event, the symposium had to be shortened to one day due to external issues that came up the day before the start of the event. Hence, particularly foreseen discussion and brainstorming sessions could not be implemented to the extent as it has been originally planned.

The objectives of the symposium have been defined as follows:

- Inform on the present situation in the sector and CCA-NER assessment results
- Provide space for dialogue between stakeholders in the bamboo sector
- Showcase innovations in the bamboo sector
- Discuss opportunities and challenges for making business in bamboo
- Explore options for partnerships and joint action.

3. Participants and Minutes

3.1 Participants

In total 40 persons participated in the event. Almost half of the participants of the symposium have been representatives from the private sector including entrepreneurs, NGOs, civil society organizations and representatives from R&D, and 45% are working with government institutions. The list of participants with contact details is attached as annex B.

With only 13% the share of female participants has been very low. Hence, participation of women should explicitly be encouraged in future events. In regard to the latter it may be considered to organize separate events for specific interest groups or market actors like women, NGOs or entrepreneurs, which can then be brought together to a common workshop at state level to get better participation and more open discussion and exchange.



3.2 Speeches

Welcome address and introduction of the speakers for the opening remarks was delivered by Dr. I.V. Ramanuja Rao, Chairman of CIBART, Senior Advisor to INBAR and member of the study team.

In his keynote, the Principal Secretary & PCCF Mizoram, Mr. Pu Lalranthanga, thanked the organizers and the Government of Mizoram for making this event possible, and highlighted the outstanding importance of bamboo in Mizoram for the livelihoods of local communities, ecology and as wildlife habitat.



He pointed out that bamboo is deeply rooted in the traditions of the people of Mizoram who struggle to create monetary value out of this precious resource in modern times. Despite many initiatives the sector could not have brought forward to date facing various difficulties like the recent downturn of the paper milling industry.

Mr. Lalranthanga stressed that the Government of Mizoram is well aware of the big role that bamboo could play in the economy of the state and within the frame of available means is working towards the development of the sector.

He informed that also NITI Aayog, Ministry of DoNER, MoEF&CC and MoA&FW show interest, and NBM under MoA&FW is being discontinued now opening the possibility of revival through other means to be examined. Private initiatives including reputed companies like IKEA and Euroflax may promise a new successful chapter where earlier initiatives have failed.

The way forward is marked by concerted efforts in sustainably utilizing the potential of bamboo as a change agent for poverty alleviation by significantly contributing to the development of rural economy and low cost option for addressing the challenges of climate change, achievement of the Sustainable Development Goals and Paris Agreement as well as initiatives like Namami Gange, Swacch Bharat Abhiyan, Smart Cities and Make in India.

Mr. Lalranthanga furthermore informed that discussions on bamboo as subject to be dealt by a single ministry, a national level entity dealing with various issues related to bamboo, providing an enabling environment and uniformity with respect to felling and transit regime across states, policy directives and incentives, and for market development disadvantageous ASEAN Indo Trade Agreement have taken place just last week, which let expect to see positive coming out in the near future.

Dr. Uwe Scholz, GIZ Programme Director CCA-NER, informed about GIZ and its activities both in India and CCA-NER in particular. GIZ is an implementing agency of the German Ministry of Economic Cooperation and Development working in over 120 partner countries. GIZ employs about 17,000 people of which the vast majority is local staff. The Governments of Germany and India can look back on several decades of development cooperation and the GIZ programme in India, which is focusing on sustainable energy generation, is the worldwide second largest after Afghanistan.

The objective of CCA-NER is to improve sustainable and climate resilient management of the natural resources forest, water and soil in 5 states of the north eastern region of India, namely Meghalaya, Sikkim, Nagaland, Arunachal Pradesh, and Mizoram. Activities to date encompass for instance support in the drafting and review of the State Action Plans on Climate Change of Sikkim, Nagaland and Meghalaya, and developing the Eri-silk value chain and an Integrated Water Policy for Meghalaya.

CCA-NER was formally launched in Mizoram in February 2016 and Dr. Scholz confirmed the assistance of the project in developing the bamboo sector in the state. He sees great potential in bamboo as a tool for inclusive economic development and climate change adaption in Mizoram and stressed the fact that bamboo is much more than baskets and handbags.

Mr. Rosiama Vanchhong, Additional PCCF, pointed out the importance of a bamboo action plan for the state and Mr. Zonthankhuma, Commissioner Mizoram Department of Commerce and Industry, drew attention to the work of the Bamboo Development Agency and the importance of public-private partnership.

A note from the Joint Secretary of MoDoNER, who could not join the event, was presented by Mr. Kenneth Pala, Coordinator CCA-NER. The Joint Secretary, Mr. S.N. Pradhan, wished a fruitful symposium and pointed out the following MoDoNER topics:

- Establish a Regional Institute of Excellence and Innovation for bamboo development in the NER.
- Persuade all state governments to amend the forest act and treat bamboo as a grass.
- Advocate free movement of bamboo without restrictive taxes across interstate borders.
- Establish an entire bamboo value chain from plantation to selling of by-products.
- Facilitate more and more bamboo based enterprises set up under PPP mode.
- Proactively facilitate and coordinate in domains of skilling, value addition, marketing, innovation and R&D.
- Place bamboo as a potential game changer for the NER economy as such by highlighting its usage as green gold when scientifically farmed and developed.



3.3 Presentations

Mr. Lalthangliana Murray, Mizoram Chief Conservator of Forests, opened the input session with a presentation on bamboo in Mizoram. He provided available data on the resources and informed about the state bamboo policy, implementing agencies and major activities conducted in the state like bamboo plantations, trainings and promotion campaigns as well as the latest developments in the sector.

Major constraints are the inaccessibility of large parts of the resource of which about 50% is not utilized, the discontinuation of paper mills like the Cachar Paper Mill, which has been the main destination for Mizoram bamboo, and urgent need of capacity building for artisans and entrepreneurs, training in bamboo management, post-felling management and marketing as well as the need for an assessment of the bamboo resources and development of a road map for the state.

He also informed about the uses and processing of bamboo in Mizoram and the Bamboo Centre in Lengpui, which at present is not operational, but could be revived and in the frame of a PPP further developed into for instance a bamboo technology centre of applied research with regional importance.

A strategy for sustainable bamboo development in Mizoram was the topic of the presentation given by Dr. R.N. Pandey, Siddhida Farm Services Agartala. Based on his analysis of the bamboo sector in Mizoram, Dr. Pandey suggests applying a systems approach for the development of the sector, which should be cluster-based with creation of community enterprises backed through Public-Private and Professional Partnership, and sub-sector and product specific with need-based innovation and technology extension. Building up strong linkages between the different market actors is of particular importance.

He furthermore outlined desirable schemes like for bamboo plantations, the establishment of primary processing centres and promotion of local manufacturing units in bamboo industrial parks by state level nodal agencies, and a transport subsidies and market development scheme with provision for branding, packaging and barcoding to be worked out in Mizoram to take the bamboo sector forward.

Ms. Ritu Varuni, e'than Design Studio informed about her work through presenting innovative high quality handicraft products manufactured by artisans in Nagaland. She explained that ideas for new designs can't be produced on demand, but develop from looking at things from a different angle. Important in her point of view is that an innovative product besides attracting by its design and very good manufacture needs to have a function.

Ms. Varuni stressed the need to preserve but also further develop traditional design and styles for instance by using traditional colour pattern and forms to give utensils a special note. She encouraged to experiment and combine bamboo with other materials like wood and showed how new product designs can be developed checking if physical characteristics or structure of bamboo can better serve the purpose or beautify the appearance of non-bamboo products.

Mr. Werner Kosemund from INBAR and Dr. I.V. Ramanuja Rao presented the results of a desk study on bamboo in the north-eastern region and feasibility study for a pilot project in Mizoram, which has been commissioned by CCA-NER. Furthermore, Dr. Rao showed various examples of innovative uses of bamboo from India and other countries.

The presentations underlined the extraordinary role and importance as well as to date only partly utilized potential of bamboo. Despite hardly any value is added to about 1/3 of the bamboo used, the market in NER is estimated on 62.5 billion INR in 2015 and the sector has the potential to generate additional 80 million person days of employment in the region.

Women and youth, especially those in poor rural households, are the primary target group of the envisioned pilot project. In addition, existing and prospective local entrepreneurs shall be included. Other beneficiaries are technical personnel and rural extension and business agents from grassroots organizations and government.

The suggested approach addresses strengths and opportunities of bamboo development from the bamboo side and evaluates and tests products from the market side, then equally from the product side. It does not look at bamboos per se, but focuses on specific bamboo species of which each needs a technology and business ecosystem of its own. The key bamboo species targeted for the pilot is *Melocanna baccifera*.

The focus is on producing primary processed bamboo commodities such as shoots, bamboo poles, flattened bamboo laths, slats and slivers in quality and commercially attractive and viable quantities in micro and small enterprises in rural areas, which have markets in the larger Indian market. A further value chain is the production of (activated) charcoal, charcoal briquettes and biochar as well as bamboo vinegar on household/village level to transform consumers into producers and entrepreneurs.

Generating value and jobs in their own right, set up of CO₂ neutral bamboo biomass gasifier power units with sufficient working capital and backward linkages into bamboo supply and forward linkages into user enterprises is planned to overcome the chronic blackouts that enterprises face at present.

3.4 Discussion

The discussion took place in a very open and constructive atmosphere and breaks and lunch time were intensively used for further debate and exchange.

Suggestions made through the feasibility study are regarded as practical and feasible by the participants and would take development to the masses. Participants from the private sector stressed that commonly faced business problems of technology, capital, logistics, etc. would need to be factored in. It was generally agreed that products and production processes that are rurally possible, home and village-based, are what is needed since the people in villages are close to the resources and the approach would enable self and wage employment. This was also emphasized by the Principal Secretary, Mr. Lalranthanga, and Mr. Murray. The strategy of focusing on *Melocanna baccifera* and quality commodity production was also considered appropriate.

The need to systematize planning and align it to the needs of people and industry has been pointed out as a take home lesson from the presentation of Dr. Pandey. The problem lies in the detail, in finance, and especially in implementation and persevering with the plan.

Mr. Laldinliana Chhange of King Marketing, who has developed glue-boards and products of the kind needed by IKEA and been selected as potential vendor now working on acquiring space, finances and getting other regulatory approvals to establish an enterprise in Mizoram, noted that there is in particular need to address improvement of road infrastructure, availability of quality raw material through application of scientific bamboo management and the lack of skilled manpower, which seriously affects production costs and thus competitiveness of business in Mizoram. He also mentioned that the government scheme for supporting enterprises seems not being functional and that there is an urgent need for examples of successful businesses to attract companies like IKEA and RUSTA.

The Principal Secretary informed that the Ministry of Commerce and Industry is reworking the North East Investment and Promotion Policy and noted that logistics remains a crucial problem. He informed that the broad-gauge rail link should be ready next year, which would help to ease the situation. The Chittagong waterway transport needs to be taken forward, and the Sittwe port linkage also needs attention to resolve land issues that have come in the way of completing the project which would provide access to a port for Mizoram.

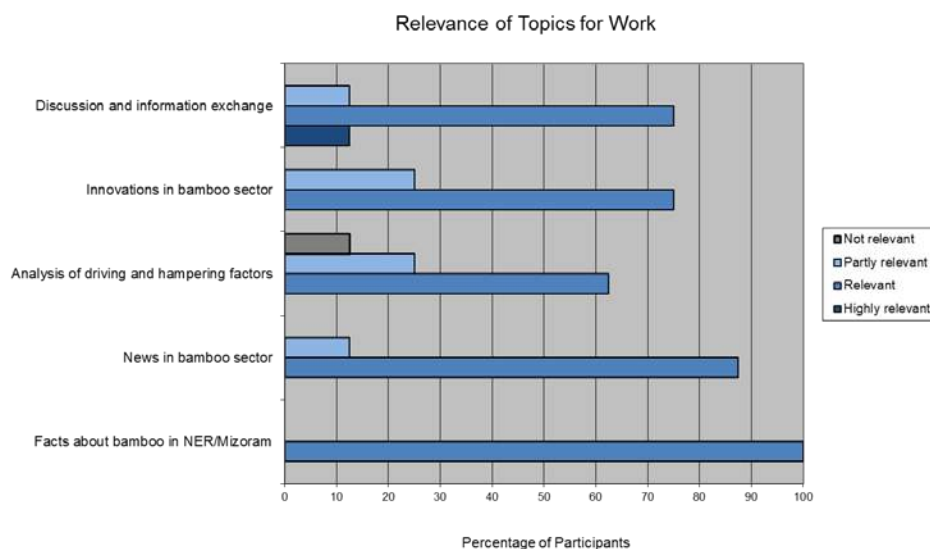
On the question of funding possibilities for entrepreneurs within the Indo-German Cooperation, Dr. Scholz referred to UPNRM, which has a special KfW-NABARD loan-grant scheme. He also informed about the Senior Expert Service (SES) where companies can apply for secondment of senior experts like economists, engineers and technicians from Germany. Mr. Kenneth Pala added that CCA-NER is in particular promoting green rural energy and regards water as key, pointing out activities like spring recharge.

The showcased innovative par-excellence products designed by Ms. Ritu Varuni and produced by artisans in Nagaland attracted much attention. One on one discussions showed that the participants felt the prices are relatively high. Ms. Varuni explained that with few pieces being produced, these remain niche or collector items. To achieve higher volumes with lower prices is a chicken-and-egg issue and would first need the placement of a supportive order that can help fund the continuation and expansion of the production process. Second is to develop production systems that enable production of quality craft products in volume. Both have to happen in tandem. Third is to position such products on e-commerce market places and other retail spaces so that more potential buyers are addressed and can obtain them.

The short film on bamboo and bamboo entrepreneurs in Mizoram produced by the INBAR team was well received. Participants agreed that there is dire need to communicate to people on bamboo and make bamboo visible. Bamboo in India and particularly in Mizoram is so commonplace that it is taken for granted and not given a second glance, essentially getting ignored. It should be made "sexy" and attractive to all segments of the population and products need to be designed that make bamboo a part of urban and modern life just like it has been part of rural and traditional life to date.

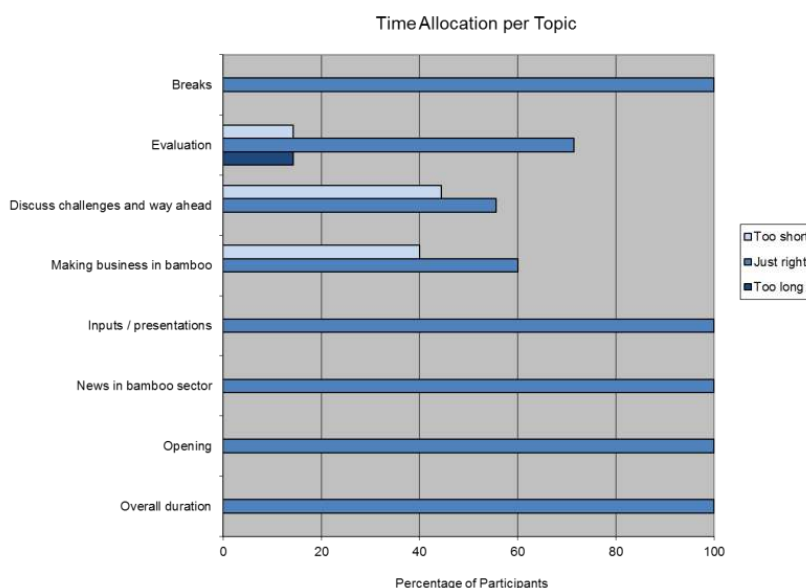
4. Evaluation by Participants

Organizers, resource persons and speakers excluded, about 44% of participants evaluated the event. In view of relevance of the event topics for the work of the participants, facts and news from the bamboo sector in NER and Mizoram as well as information exchange and discussion have been rated as relevant by almost all participants while being informed about innovations in the sector is regarded as only partly relevant by 25% of the participants. Analysis of driving and hampering factors are partly relevant or not relevant for 25% and 13% respectively.

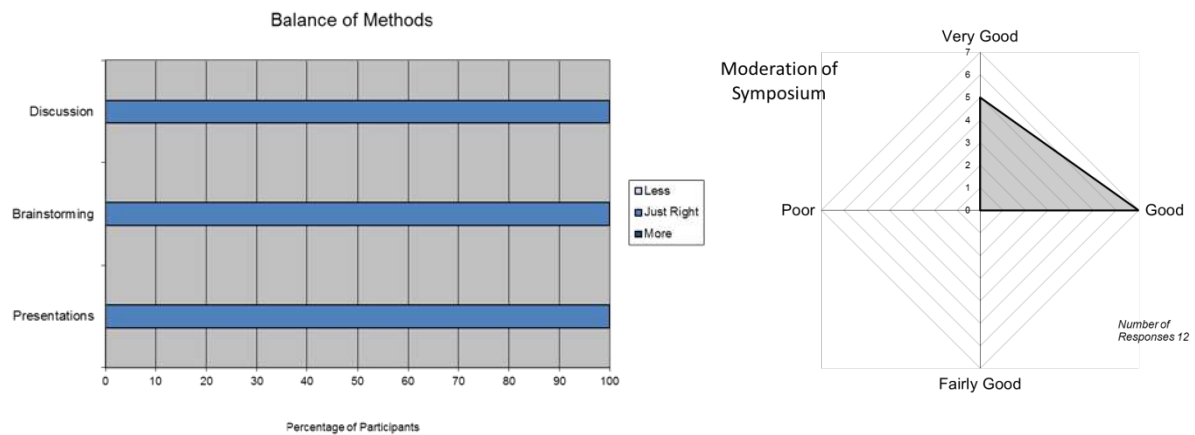


The result stresses an existing demand for up-to-date data and information on the bamboo sector.

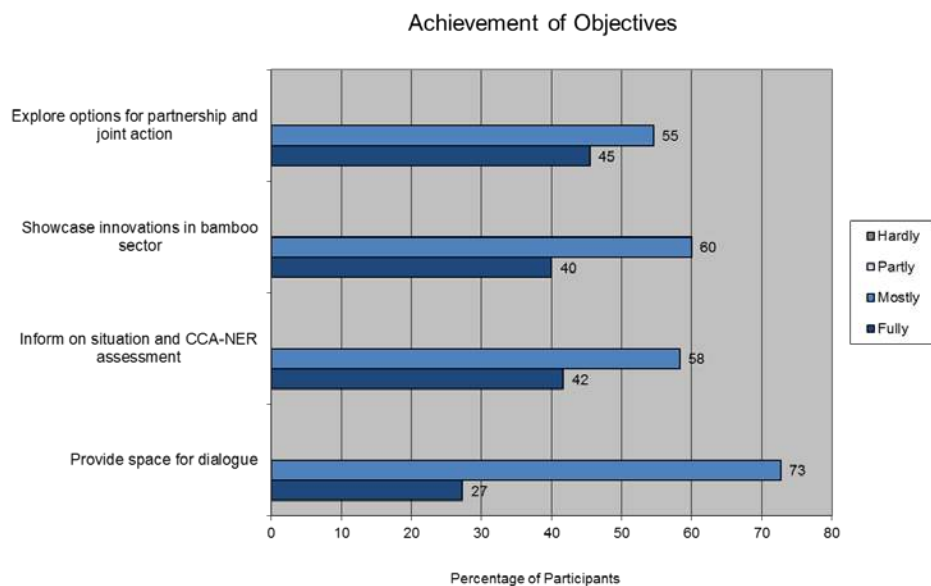
Balance of applied methods and time allocation per topic has been rated by almost all participants as just right except the allocated time for discussion on challenges and making business in bamboo, which 44% respectively 40% of the participants regarded as having been too short.



The moderation of the event has been rated as good or very good by 58% respectively 42% of the participants.



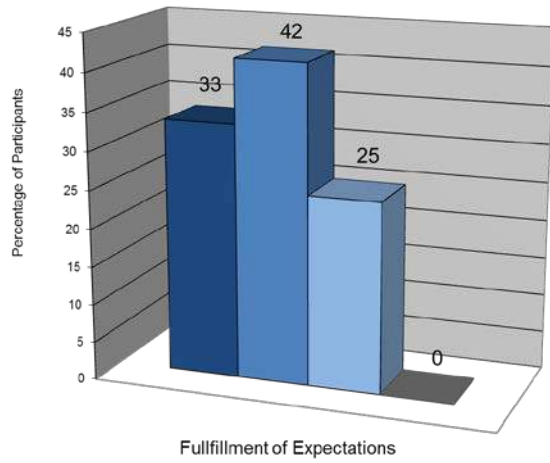
In the average, the objectives being informed on situation and CCA-NER assessment, getting introduced to innovations in the bamboo sector and explore options for partnership and joint action are evaluated as having been fully achieved by 42% of the participants and by 58% as mostly achieved.



Providing space for dialogue has been rated by 27% and 73% of the participants as having been achieved fully respectively mostly, which points together with the rating given for allocated time to topics towards the need and importance of exchange of experiences and open discussion.

The symposium did fully or mostly fulfil the personal expectations of 75% of the participants. One quarter rated their expectations to be fulfilled partly.

The organization of the event was evaluated by 70% of the participants as good and by 30% as very good.



Post scriptum

The moderator likes to thank all who contributed to make this symposium be a successful event, and like the Principal Secretary & PCCF Mizoram has also pointed out in his keynote, in particular Mr. Tsewang Gyaltson, E&F Mizoram and CCA-NER nodal officer, for his professional and extraordinary engagement.

Annex

A. Final Agenda

Symposium on Bamboo Perspectives in Mizoram and the Northeast

25 October 2016
Aijal Club, City Centre, B-69, Aizawl, Mizoram

AGENDA

| Tuesday 25.10.2016 | |
|--------------------|---|
| Time | Subject |
| 09:30 | Registration |
| 10:00 | Welcome & Opening remarks <i>INBAR & GIZ</i> |
| 10:20 | Speech <i>Executive Director, BDA Mizoram</i> |
| 10:30 | Keynote Speech <i>Principal Secretary, EF&CC Mizoram</i> |
| 10:50 | Agenda <i>Moderator</i> |
| 11:00 | News & Insights from the bamboo sector in the north-eastern region (NER) <i>Presentation from Mizoram</i> |
| 11:20 | Tea Break |
| 11:35 | Development of bamboo industry in Mizoram <i>Presentation by Dr. R.N. Pandey</i> |
| 12:00 | Bamboo innovations <i>Presentations and talk, Ms. Ritu Varuni and Dr. Ramanuja Rao</i> |
| 12:40 | Results of desk study NER and envisioned pilot in Mizoram <i>Presentation and discussion, Moderator and Dr. Ramanuja Rao</i> |
| 13:15 | Lunch |
| 14:15 | People & Bamboo in Mizoram <i>Short film</i> |
| 14:25 | Making business in NER: Costs and competition <i>Discussion round</i> |
| 15:00 | Tea break |
| 15:15 | Making business in NER: Challenges and opportunities <i>Brainstorming and discussion</i> |
| 15:45 | Evaluation of symposium <i>Moderator</i> |
| 16:00-20 | Farewell & Closing <i>Principal Secretary, CCA-NER and INBAR</i> |
| 18:00 | Joint Dinner |

B. Participants List

| SN | Name | Organization | Email | Tel | Remarks |
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| 35 | Zonthankhuma | Commissioner, DC&I | n.a. | | Speaker |
| 36 | Pu Lalranthanga | Principal Secretary & PCCF | lalramifs83@yahoo.co.in | | Key note |
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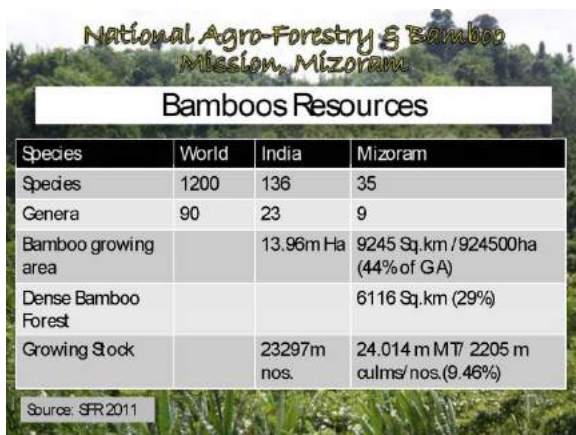
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C. Presentations

Mizoram at a Glance

| | | |
|-----------------------|---|--|
| State Capital | : | Aizawl |
| Area | : | 21081 Sq.km. |
| International Borders | : | Myanmar, Bangladesh & Manipur |
| Population | : | 1091014 i.e. 52/ Sq.km. |
| No. of Villages | : | 817 |
| Annual Rainfall | : | 2479 mm. |
| Temperature | : | 30°C to 10°C |
| Total Forest Cover | : | 19183 Sq.km. |
| Forest Types | : | Tropical Wet Evergreen & Semi-Evergreen, Montane Subtropical Forests, Temperate Forests, Bamboo Forests, Quercus Forests, Jhumland |



Species of Bamboos in Mizoram- 35 species identified

Bambusa balcooa (Vai-Rawthing), *B. bamboos* (Raw-hling)
B. dampiena (Dampa-mau), *B. mizorameana* (Talan)
B. Multiplex (N/A), *B. Nagalandeana* (Ralleng-mau)
B. Nutans (Ankuang), *B. tulda* (Rawthing),
B. Vulgaris (Vai-rua), *B. vulgaris* (Var vittata) (Vairaw-eng)
B. vulgaris (famini) (Vai-rua) *Dendrocalamus asper* (Asper), *D. Giganteus* (Raw-pui) *D. Hamiltonii* (Phulrua), *D. Hookeri* (Rawiak/Rawkhauh) *D. Laetiflorus* (N/A), *D. Longispatus* (Rawnal) *D. Manipureanus* (Rawchhia), *D. Skkimensis* (Raw-mi) *D. Strictus* (Tursing) *Melocalamus compactiflorus* (Sairil) *Melocalamus compactiflorus* (Sairil) *Melocanna Baccifera* (Mautak) *Neomicrocalamus manni* (Saiman) *Thryostachys oliveri* (Phunkirua) *Phyllostachys edulis* (N/A), *P. Mannii* (N/A) *Schizostachyum dullooa* (Rawthla) *S. Fuchsianum* (Rawngal), *S. Munroii* (Nat) *S. Mannii* (Raw-te/ Chal-te), *S. Pergracile* (Mau-dang) *S. Polymorphum* (Chal), *Snarundinaria falcate* (Lik) *S. Griffithiana* (Phar), *S. Longispiculata* (N/A)

Bamboo Policy of Mizoram 2002

Need for Bamboo Policy

1. Bamboo contribute Socio Economic Advancement of modern Mizo society
2. Immense potential in improving rural economic, industrial development and sound economic base for the state
3. Needs clear vision, policy frame work and road map

Aims & Objectives

1. Protection and prevention of mountain ecology and biodiversity associated with Bamboo Forest
2. Sustainable development and utilization
3. Promotion of private bamboo plantation and improvement of bamboo productivity
4. Promotion of bamboo based industry, promotion of local traditional bamboo craft with improve technology, design and market linked trade
5. Promotion as wood substitutes, awareness and exploitation of the economic potential of bamboo

Organization Setup

State Bamboo Steering Committee

Chairman – Chief Secretary
 Member Secy. – State Mission Director, NABM
 Members
 Commissioner/ Secretaries- E&F, Finance, Agriculture, Horticulture, Industries, T&CNLUP, RD, LR&S

Implementing Agencies

Resource management

> Forest Development Agencies (FDA) within Forest Areas under E&F Deptt.

Entrepreneurship Development

> Bamboo Development Agency (BDA) under Industries Deptt. & NLUP

Major Activities on Bamboos

1. Plantation in Forest Areas executed by FDA (NBM)
2. Plantation in Non-Forest Areas by BDA, conversed with NLUP since 2010-11
3. Plantation in Govt. Lands outside RF
4. Improvement of Existing Stock – in Village Bamboo Supply Reserves/ Mau hak
5. Training of Farmers within State and Outside State
6. Training of Field Functionaries
7. Workshop/ Seminars
8. Promotional Campaign

Achievement under NBM

| Year | PLANTATION AREA (ha) | | | |
|---------|----------------------|-------|------|-------|
| | FA | NFA | IMPR | TOTAL |
| 2006-07 | 2500 | 2000 | NIL | 4500 |
| 2007-08 | 4556 | 1500 | 1800 | 7856 |
| 2008-09 | 1500 | 500 | 200 | 2200 |
| 2009-10 | 3000 | 2500 | 944 | 6444 |
| 2010-11 | 5900 | 1600 | 2520 | 10020 |
| 2011-12 | 5150 | 1600 | 1012 | 7762 |
| 2012-13 | 5246 | 2800 | 1000 | 9046 |
| 2013-14 | 6500 | 2500 | 800 | 9800 |
| 2014-15 | 500 | 2000 | 200 | 2700 |
| 2015-16 | 3000 | 1200 | 400 | 4600 |
| TOTAL | 37852 | 18200 | 8876 | 64928 |

Activities starts from Nurseries



Multiplying Seedlings of *Bambusa nutans* with Macro-proliferation method. Central Nursery, Sairang



Reclamation at Sakawrhmutuai



Private Plantation



Natural Re-generation



Bamboo Centre of Excellence, Lengpui



Bamboo
Shelter for most rural Household



Bamboo Shoots...
Foods for all



And.. Source of Fuel and energy

Latest Development

1. Departmental extraction for sale outside Mizoram in its raw form = Revenue = Rs 844/mt.
2. Venture with Euroflax Industries Ltd., Mumbai on Bamboo fibre. MoU soon
3. IKEA of Sweden has come for Bamboo Boards
4. More venture into Mizoram expected



Constraints

- Harvesting: Around 50% Bamboo Growing Stock inaccessible
- >>>>Fund for Bamboo extraction road
- Capacity Building(HRD):
- For Entrepreneurs/ artisans etc.
- Bamboo Industrial Unit: transportation in raw form uneconomical, conversion of Bamboo in its additions
- Big Business Corporate may venture into Mizoram.
- Research & Development
- Supply to HPC Panchgram discontinued

Focus Phase/ Roadmap

A. Plantation & Product Development Phase

- Nurseries, Area expansion, Improvement of existing stock
- Resource assessment
- Technology Transfer
- Awareness Programmes

C. Value Added Phase

- Product Design Development
- Design Workshop, Fund support to designers, Inter Country exchanges, documentation, Training/ HRD, market & trade development, marketing information system, wholesale or Retail market, Bazaar, Participation in domestic/ International Trade Fairs, Technical Services, Data base Generation and management etc.

B. Processing & Product Sales Phase

- Post felling management & marketing
- Grading system, Preservative method, introduction of new and improvised tools & machinery, training of artisans, setting up of CFC, marketing etc.

How?

- Action Plan for above phases
- Man power available
- No state fund
- Funding ?





Providing Technical, Strategic, Marketing and Project Management solutions for sustainable rural development through promotion of Farm based enterprises

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VISION

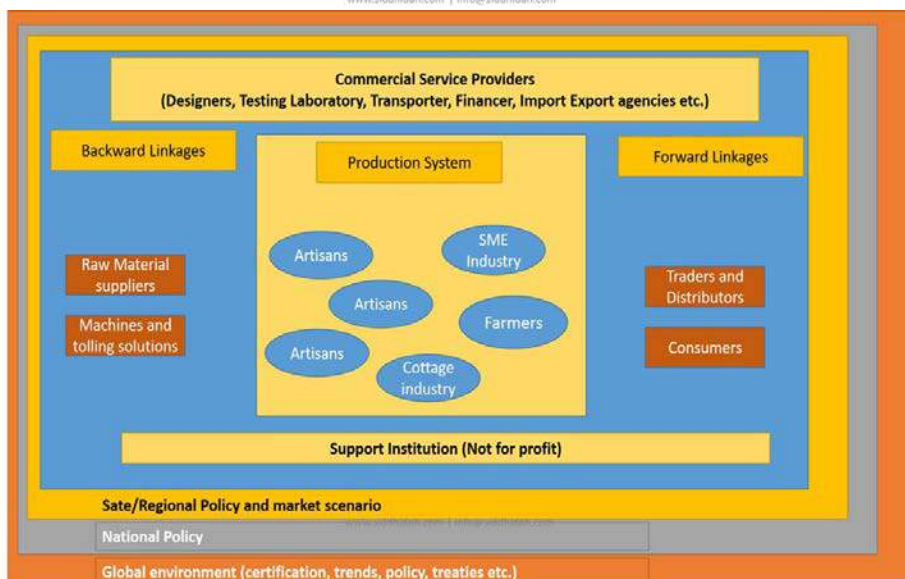
To be a leading Bamboo State in the country, Mizoram envisions a vibrant bamboo-based industry in the state. Starting from well managed plantations to industries, manufacturing diverse, globally benchmarked, bamboo products, using latest technologies with commitment to

- Environmental sustainability
- Social equity
- Cost Competitiveness

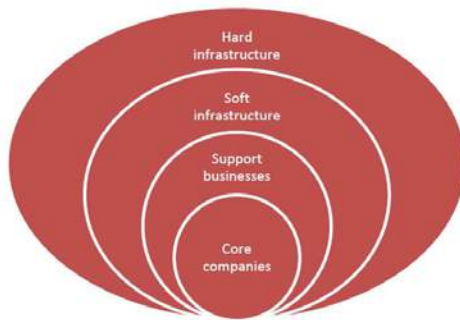
THE APPROACH TO BAMBOO SECTOR DEVELOPMENT IN MIZORAM

1. Systems approach – let no factor in the system be ignored
2. Innovation-driven cluster-based development
3. Sub-Sector specific strategy for Plantations, primary processing, Cottage Industries and manufacturing Industries
4. Product specific technology induction and marketing
5. Value chain improvisation for cost competitiveness
6. Need based Innovation and technology extension towards competitive edge
7. Strong linkages between growers, processor, manufacturers and users/buyers
8. Synergy among state level players in taxation, policy, implementation and manufacturing
9. Convergence of resources for bamboo sector development and local market creation
10. Creation of sustainable Community enterprises at backend through 4P (Public, Private and Professional Partnership) approach

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Cluster members



Source: Cluster Navigators Ltd, 2002

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Hard Infrastructure

- Bamboo Industrial Park
- Primary processing centres

Soft Infrastructure

- Strengthening BDA
- Strengthening ARCBR

Support businesses

- Tie up with design institutions
- Tie up with equipment manufacturers
- Tie up with research institutions
- Tie up with market agencies

Core companies

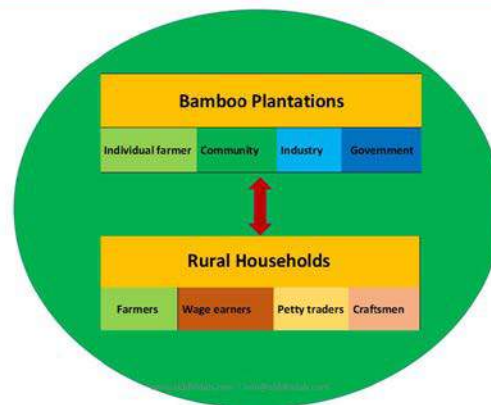
- Bamboo Board and allied Industries
- Biomass industries like Pulping units, charcoal, electricity
- Chemical processing units like textiles, ethanol
- Bamboo foods and beverages
- Consumer goods eg. Tooth brushes, toothpick, incense etc.

Successful clustering is about

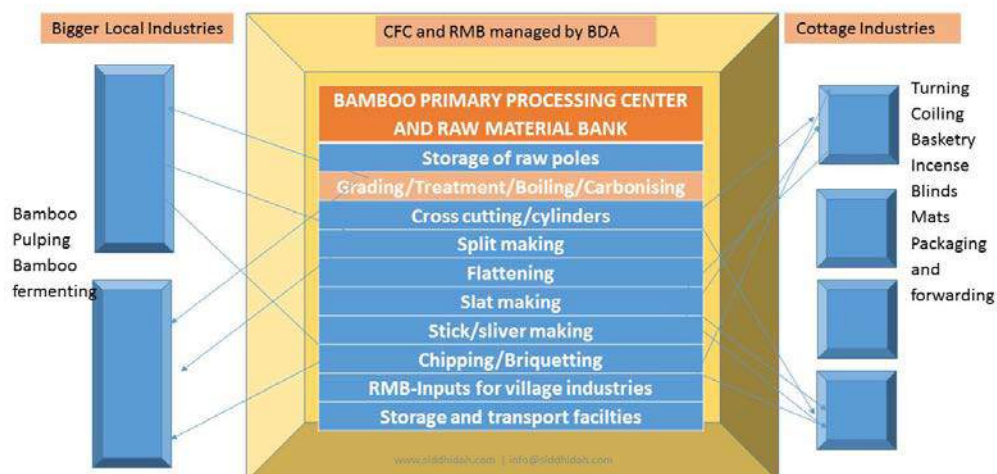


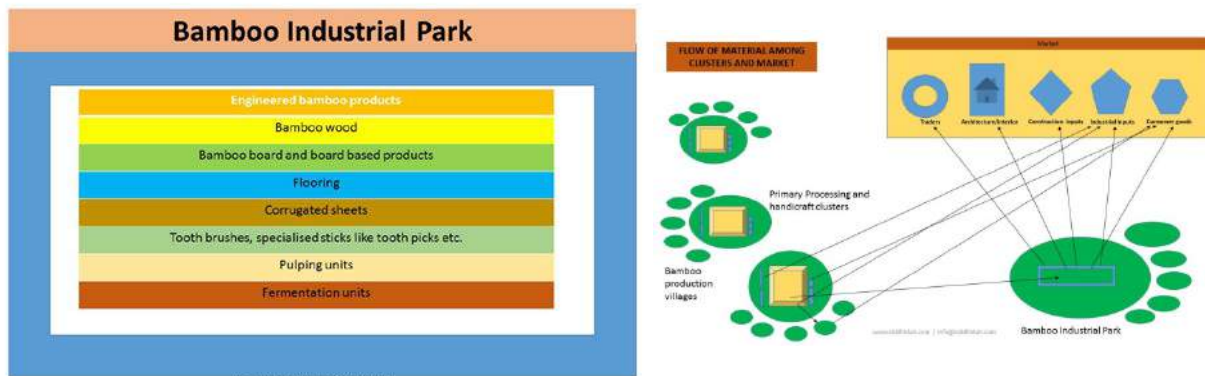
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A Bamboo Production Village : Key Stakeholders



A Primary Processing Village : Key Stakeholders





ACTION PLAN

1. Baseline study, identification of key Areas of intervention
 - i. Resource mapping at block level and identification of areas for bamboo cultivation
 - ii. Production to consumption chains of bamboo in Mizoram
 - iii. Identification of major markets in India
 - iv. Product identification for commercialization
2. Preparation of a vision and strategy document for Bamboo development in Mizoram
3. Preparation of DPR for Bamboo Sector in Mizoram for 15 years with measurable goals
 - i. Bamboo Resource augmentation and diversification
 - ii. Bamboo Primary Processing Centers
 - iii. Bamboo Cottage Industries
 - iv. Bamboo Industries
 - v. E-transit Passes for bamboo
 - vi. Certifications and benchmarking of Plantation, products and units
4. Action Plan to achieve goals outlined in DPR document
 - i. Formulation of Schemes
 - ii. Administration of schemes
 - iii. Measures to ensure precision in implementation
 - iv. Monitoring and evaluation of development interventions
5. Strengthening Bamboo Development Agency as a platform for convergence and synergy in bamboo sector and for administration of Bamboo development scheme in Mizoram.

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SCHEMES DESIRABLE FOR BAMBOO SECTOR DEVELOPMENT IN MIZORAM

1. Bamboo Plantation Development Scheme for augmentation and diversification of resource base
2. Scheme for establishment of Bamboo primary processing centers under 4P (people professional public partnership)
3. Bamboo cottage industry development scheme (one point assistance to handicraft artisans)
4. Transport Subsidy scheme for transport of bamboo and bamboo products
5. Scheme for promotion of local manufacturing units in Bamboo Industrial park
6. Market development scheme with provision for branding, packaging and barcoding of products
7. Central assistance for development of state level nodal agencies and institutions for promotion of bamboo sector

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BAMBOO FARM AND INDUSTRY DEVELOPMENT SERVICES

1. Diagnostic visits & Orientation Talks
2. Training programs/Tailored workshops for bamboo based enterprises
3. Focussed awareness campaigns
4. Project Management Consultancy
 - i. Project need assessment and baseline survey
 - ii. DPR preparation
 - iii. Preparation of action plans
 - iv. Project management services
 - v. Project Impact assessment services
5. Turn key implementation of Bamboo Projects
6. Establishment / Revival and PPP operation of Bamboo Industries / Common Facility centres
7. Bamboo Sourcing and supplies
8. Bamboo Product development, Scale up and marketing
9. Bamboo Tissue culture and Nurseries Development
10. Bamboo Plantation development

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Bringing perfection and fulfilment in Farm Business

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International Network for Bamboo and Rattan

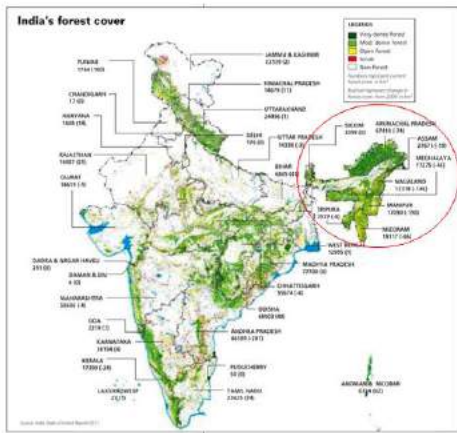
Bamboo in North East India

Results of a Desk Study supported by the Indo-German Development Project Climate Change Adaptation in the North Eastern Region

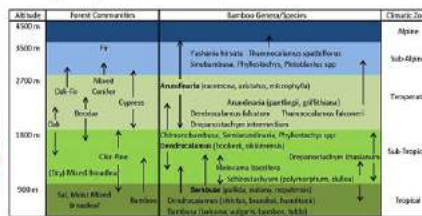


What's so special about Bamboo & NER?

Bamboo in the North East



Integral part of ecosystems



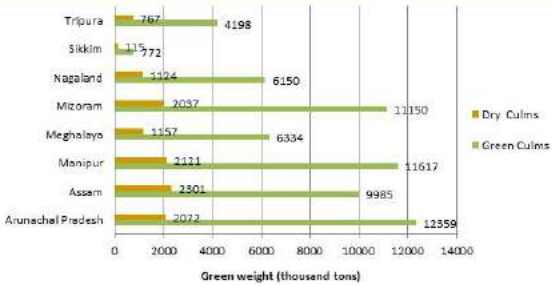
Keystone species

89 different bamboos

3.1 million hectares

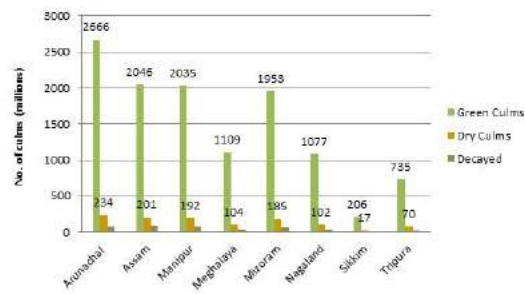
2/3 of growing stock in India

How heavy bamboo weighs in NER?



62,565,000 tons of green culms

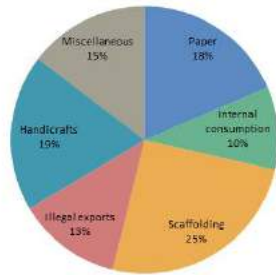
About 10 times as much as the Great Pyramid of Giza



11,827,000,000 green bamboo culms

About 1.5 times as much as human beings on the globe

How is it used?



Hardly any value added to about 1/3 of the Bamboo used

NER – Bamboo Market 2015

62.5 billion
INR

INDIA – International Trade 2014

| Item | Import (INR thousand) | Export (INR thousand) |
|--------------------------|-----------------------|-----------------------|
| Raw bamboos | 3,661 | 3,047 |
| Bamboo shoots | 131,128 | 8,947 |
| Charcoal | 341 | 7,978 |
| Flooring/shaped products | 18,969 | 34,367 |
| Panels | 1,412 | 31,451 |
| Mats/matting/screens | 32,587 | 110,527 |
| Plaits/similar products | 4,041 | 6,449 |
| Basket works | 18,693 | 27,250 |
| Paper articles | 2,448 | 7,011 |
| Seats of bamboo/rattan | 24,968 | 11,827 |
| Furniture | 11,827 | 40,005 |
| Total | 250,075 | 288,860 |



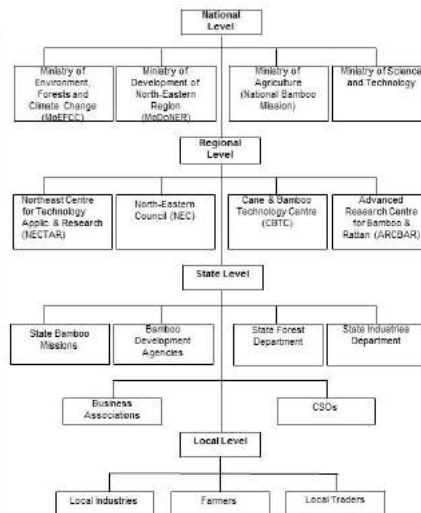
Why is it like that?

Outside the Sector

- Poor infrastructure
- Inadequate connectivity
- Limited skilled labor force
- Difficulties in accessing credits

Within the Sector

- Low productivity
- Discouraging policies and tax structure
- Lack of technical know-how and innovation.
- Poor awareness and access to markets
- Lack of appropriate coordination



What makes success probable?

Despite these difficulties, there are success stories of entrepreneurs who have started on small scale and made a name for themselves in the region. Though small now, their number can grow...

- Urgency or need
 - Compliance with market requirements
 - Ease of the technology
 - Appropriate institutional model and finance scheme
 - Access to information
-
- Professional and strategic guidance and support
 - Government support in kick-starting and taking bamboo entrepreneurship forward by tapping potential of smallholders, young entrepreneurs and women

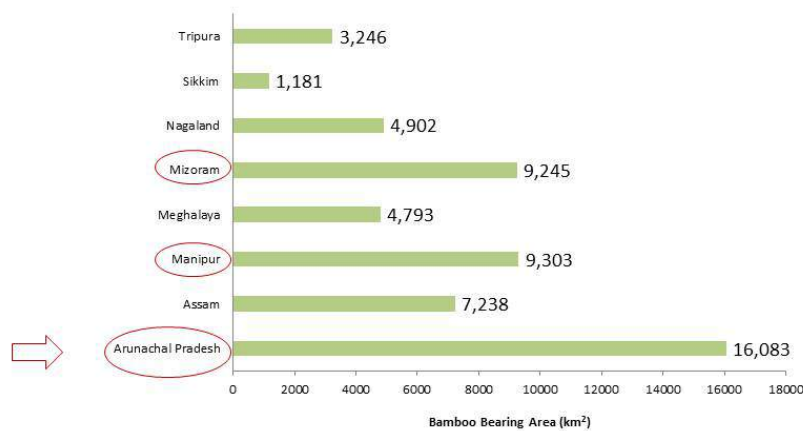


Thank you for your kind attention!

| Bamboo Species | Commodity Group | Size of Enterprise | | | |
|---|--------------------------|--------------------|-------|--------|-------|
| | | Micro | Small | Medium | Large |
| All bamboos | Fuel (Charcoal/Energy) | | | | |
| Bambusa balooea, B. tulda, B. nepalensis, Dendrocalamus strictus, D. hamiltonii, Melocana baccifera | Food (Shoots) | | | | |
| Bambusa vulgaris, B. tulda, B. nutans, B. pallida, Dendrocalamus brandisii, D. strictus, D. sikkimensis, Melocana baccifera, Schizostachyum polymorphum, S. dulica, Thamnodialamus aspathiflorus | Handicraft | | | | |
| Bambusa balooea, B. tulda, B. bambos, B. nepalensis, B. pallida, Dendrocalamus hamiltonii, D. hookeri, Arundinaria racemosa, Diapanostachyum intermedium, D. khasianum, Melocana baccifera, Schizostachyum polymorphum, S. dulica, Thamnodialamus aspathiflorus, T. falconeri | Weaving Products | | | | |
| Bambusa balooea, B. vulgaris, B. tulda, B. nepalensis, B. nutans, B. pallida, Dendrocalamus strictus, D. hookeri, Arundinaria racemosa, Diapanostachyum khasiana, Melocana baccifera | Housing and Construction | | | | |
| Bambusa balooea, B. pallida, Melocana baccifera | Sticks/Agarbatti | | | | |
| Bambusa bambos, B. balooea, B. vulgaris, Dendrocalamus strictus, D. brandisii | Furniture | | | | |
| Bambusa bambos, B. tulda, B. balooea, and various other | Boards and Flooring | | | | |
| Dendrocalamus strictus, D. hamiltonii, D. sikkimensis, Bambusa bambos, B. vulgaris, B. bambos, B. tulda, B. nutans, Melocana baccifera | Paper and Pulp | | | | |
| Various bamboos | Textiles | | | | |
| | Other* | | | | |
| * Medicines, Cosmetics, Beverages, Air and Water Purification, etc. | | | | | |



The champion is...



Enhancing the Development of the Bamboo Sector in Mizoram

I.V.Ramanuja Rao, CIBART
Werner Kosemund, INBAR
Baya Agarwal, INBAR



Ministry of
Development of
North Eastern
Region



Issues and opportunities

- **Bamboo (+):** 85% of forest resource of Mizoram, the Bamboo State
- **Logistics (-):** Land-locked, expensive road + air connectivity > expensive products
 - Two future waterway options
 - Future rail access
- **Population (-):** Low population relative to area, mostly subsistence (rural) or trading (mostly urban) economy
- **Women (+):** Women in Mizoram enjoy a good status
- **Youth (+/-):** Educated, disciplined, organized. Migration – lack of local opportunity?
- **Taxation (-):** Tax in Assam, an issue until GST?
- **Trade agreements (-):** Promotes imports, undermines domestic production
- **Conflicts (+):** Mizoram is a safe and peaceful place, tourism?

Lessons learned

- Analysis of case studies and previous studies on Mizoram indicate
- (a) product compliance with needs of the local/domestic market
 - (b) ease of the technology and appropriateness at HH/village level
 - (c) appropriate institutional model and finance scheme,
 - (d) professional and strategic guidance and support are essential for initiatives to be successful
 - (e) government can play a crucial role to kick-start and take bamboo entrepreneurship forward and provide volume markets

Melocanna, the saviour of Mizoram's soils

- Focus on Melocanna = focus on all Mizo people
- Sheer volume of Melocanna bamboo is perhaps the biggest economic asset
- Literally "binds" the land together by walling soil into compartments by unique rhizome sets; despite Jhum cultivation
- Strengthens the resilience of ecosystems and robustness of livelihoods against changes of the climate (mainly increase of average temperatures, drought, exceptionally heavy rain events and mudflows, landslides, floods)

Focus on bamboo commodities and derived value chains

- Main focus (but not exclusive), on *Melocanna baccifera*
- Quality age-marked poles in quantity, **primary processed** into commodities that can be sold as such in volume
 - (a) shoots, (b) poles, (c) laths, (d) slats, (e) slivers, in the main
 - Also (f) sticks, (g) splints, (h) chips, (i) powder, (j) leaves
- These are **secondary processed** into intermediate products, such as panels, which also have markets
- Further **tertiary processing** would produce finished products such as furniture, articles.
- Both primary and secondary processing can be done in rural household & village enterprises
- Charcoal, power, activated charcoal, fuelwood, biomass & charcoal briquettes

Bamboo Feed & Fodder (& Bamboo leaf tea)



Organic Bamboo Fibre



Bamboo lath-panel based school furniture



Skin-slats based bamboo packing cases



Slat-flooring by rural communities



Bamboo boats



Household Charcoal (HHC) - a year-round source of income for women - 200 tons/day in Mizoram

- Produced twice daily, 365 days/year, in 500 million households when cooking using firewood; only one of its kind in the world! In India, 121 million households use firewood
- Commonly discarded; now a year-round source of income for women
- Automatically turns the cooking stove into a processing unit; each woman into a micro-entrepreneur; her home into a micro-enterprise, without doing anything extra.
- Commonly, yield is approximately 10% by weight of the firewood used. Simple rocket stoves with a quenching mechanism double this to 20%-25% for the same amount of fuelwood. The charcoal has more cash value than the firewood used!
 @ 25% carbon yield; 183 million tons HHC; \$37 billion; 669 million tons of CO2 sequestered
 @ 50% carbon yield; 365 million tons HHC; \$73 billion; 1338 million tons of CO2 sequestered
- Is 4x to 8x of total global commercial charcoal production (47 million tons) that is deforesting
Charcoal = inorganic carbon = coal (back to the earth, permanently sequestered)

Vermicomposting in bamboo chambers



Bamboo vinegar – pyroligneous acid



- Pyroligneous acid from bamboo, so called "bamboo vinegar", is extracted when making charcoal
- 80-90% water with 200 organic compounds
- Many uses including various medical treatments i.e. for wounds, ulcers and other ailments, cosmetics, insecticides, deodorants, food processing, and agriculture
- A tasty crystalline salt can be made by neutralizing the acid with lye made from the ashes of the burnt wood

Power & activated charcoal from biomass gasifier

- Power has a ready market and small biomass gasifiers are useful in a landscape such as that of Mizoram
- Activated charcoal is naturally produced when bamboo is used in biomass gasifiers; this has a market
 - Surface area is in the range of 900 square metres/gram (m²/g)
 - Such a value is normally achieved using chemical treatment or steam activation process
 - The K₂O which comprises 40% of inorganic salts in bamboo ash has a significant influence in the overall char reactivity in the reduction zone of the gasifier by helping development of micropores.

Bamboo-based power production in biomass gasifiers

Ownership
 Current: 100% CIBART NGO
 Future (indicative) NCPP:
 30% CIBART
 30% Women
 30% Professionals
 10% Technical support

Cash benefit (US\$)
 biomass : power
 1 day: 12 : 80
 1 month: 360 : 2400
 1 year: 4380 : 29200

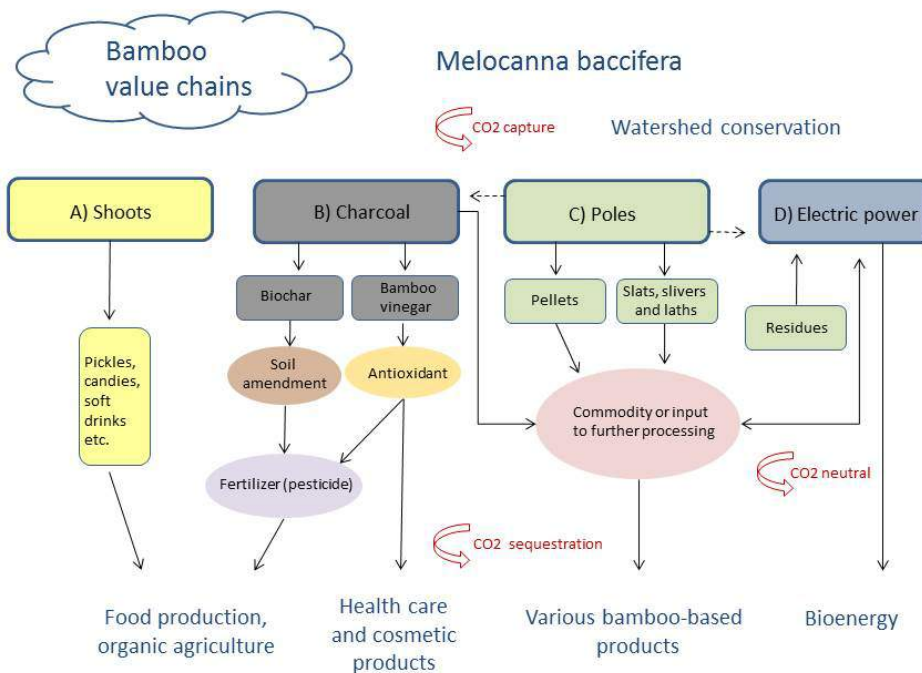
Charcoal produced:
 5%: \$ 4,380
 25%: \$ 21,900
 Unit cost: \$ 21,942



Broad usage of power
 (indicative)
 0500-0900: HH power
 0900-1700: Enterprises
 1700-2100: HH power
 2100-0500: Water pumping

Other benefits

- Value added production from enterprises e.g. HHC, flour-mill, etc.
- Quality of life – power to 160-320 HH (8h basis)
- Water supply – farms, homes



Goal & Objectives

- The **goal** of the proposed project is an enhanced sustainable inclusive economic growth and adaption capacities to climate change through smallholder-based and women and youth focused innovative bamboo solutions, which will be measured by the increased income of households through sustainable management and climate friendly local processing of bamboo resources
- **Objective 1:** Enterprise models in different value chains (commodities & end-products, pellets, charcoal, bamboo vinegar and decentralized generation of power from bamboo biomass producing bamboo commodities) are tested.
- **Objective 2:** Framework conditions for implementation of bamboo business in Mizoram is are improved
- **Objective 3:** Managerial and technical capacities of selected stakeholders in the bamboo sector of Mizoram are strengthened

Outputs

- Outputs leading to the achievement of the objectives and outcomes are:
- 1.1. Value chain for bamboo shoots is strengthened and further developed.
- 1.2. Value chain for commodities based on dimensioned laths, slats and slivers as end products or inputs for further processing and value addition is developed.
- 1.3. Enterprises manufacturing bamboo products for energy generation (pellets, charcoal, charcoal briquettes) are established or strengthened.
- 1.4. Enterprises manufacturing bamboo vinegar are established or strengthened and bamboo vinegar is certified for widespread use and introduction in mainstream markets
- 1.5. Bamboo biomass gasifier power units backward linkages into bamboo supply & forward linkages into enterprises established
- 2.1. State bamboo policy is reviewed.
- 2.2. Bamboo sector network and institutional systems are strengthened.
- 2.3. New linkages to actors in the private sector and government programmes at regional and national level are established.
- 3.1. Market actors and government staff improved their knowledge and skills on bamboo production, utilization and business management.

Moderation and Report: Werner Kosemund

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