



**MINISTRY OF FORESTRY
FOREST DEPARTMENT, MYANMAR**



**AND
INTERNATIONAL TROPICAL TIMBER ORGANIZATION**

ITTO Project PD 146/02 Rev.1(I)

"Promoting Sustainable Utilization of Bamboo through Community Participation in Sustainable Forest Management "

A report on International Training Workshop on Bamboo Propagation, Management and Harvesting: Methods, Policy issues and Strategies



**Kerala Forest Research Institute (KFRI), Kerala, India
February 27 to 05 March 2006**

**Aung Zaw Moe
Research Assistant**

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(3 Jul. 07
No. 957)

1. Introduction

Bamboo is one of the fastest growing plants in the plant kingdom. Bamboo clumps can be established in 5-6 years from the time of planting. Culms reach maturity in about three or four years. Bamboo is a viable replacement for wood and industrial raw material for both traditional and modern sectors.

In Myanmar, bamboo resource is abundant, but their utilization is limited due to the outdated processing techniques and lack of quality products. Myanmar needs to utilize bamboo resources sustainability and produce quality products. "Promoting Sustainable Utilization of Bamboo through Community Participation in Sustainable Forest Management" Project, PD 146/02 Rev. 1 (I) is implementing to enhance the socio-economic benefits of bamboo for the rural communities through their active participation in sustainable management and utilization of bamboo forest jointly organized by the Forest Department and the International Tropical Timber Organization (ITTO). To support this project, 1 project staff attended the "International Training Workshop on Bamboo Propagation, Management and Harvesting: Methods, Policy issues and Strategies" from 27 February to 05 March 2006, KFRI, Kerala, India

As increasing population, so is the rising demand for food, clothing, and accommodation for the population annually in Myanmar. Although this is one of the important sectors, it is confronted with a number of problems. In order to solve some of the problems, the bamboo growing areas need to be drawn out clear programs / strategies, focusing on conservation of biodiversity and sustainable use, livelihood security of the bamboo dependents and environmental protection.

2. Objectives

To study the techniques of bamboo propagation, the strategies and policy laid down for sustainable development of bamboo forest management and to study the systematic harvesting of sympodial bamboo (clump type) and effective utilization for bamboo industry in India.

3. Participants

17 participants from 6 countries of Bangladesh, India, Myanmar, Nigeria, Ethiopia, and Uganda were present to the training workshop. Two participants from South Asia Regional Office, INBAR, India also attended at the training workshop. Almost resource persons were scientists and researchers from Kerala Forest Research Institute, India. Detail list of participants is given in (Attached 1)

4. Location and duration

The training workshop was held at Kerala Forest Research Institute (KFRI), Kerala State, India during the period between 27 February and 05 March, 2006. The agenda of the training workshop will be attached in (Attached 2)

5. Training workshop organizer

The training workshop was jointly organized by the International Network for Bamboo and Rattan (INBAR) and Centre for Indian Bamboo Resource and Technology (CIBART) in collaboration with Kerala Forest Research Institute (KFRI), Kerala State, India.

6. Contents of the training workshop

The training workshop essentially contains two parts – lecture and field trip. In former part, the following lectures were included at the first part.

- a. Taxonomy and identification of important bamboo species by r. Muktesh Kumar
- b. Flowering of bamboos and management of flowered bamboos by dr. K. K. Seethalakshmi
- c. Information sources on bamboo by Mr. K. Sankarapallai
- d. Growing stock estimation using remote sensing by Dr. P. Vijayakumaran Nair
- e. Seed handling and seedling production by Dr. K.K. Seethalakahmi
- f. Micro-propagation of bamboo by Dr. E.M.uralidharan
- g. Nursery and plantation techniques for bamboos by Dr. R.C. Pandalai
- h. Site requirement and fertilizer management in nurseries and plantations by Dr. Thomas P. Thomas
- i. Pestmanagement in bamboo nurseries and plantations by Dr. RV Varma
- j. Disease management in bamboonurseries and plantations by Dr. C. Mohanan
- k. Vegetative propagation and nursery establishment – demonstration by Dr. K.K. Seethalakahmi and V.P. Raveedran
- l. Harvesting and clump management by Dr. R.C. Pandalai
- m. Preservative treatment for bamboos by Dr. R. Gnanaharan
- n. Bamboo processing machineries by Dr. T.K. Damodaran
- o. Environmental aspects of bamboo by Dr. S. Sanakar and Dr. MP Sujatha
- p. Bamboo policy and legal issues by Dr. P.K. Muralidharan and Dr. V. Anitha

The following field trips and study tours were included at the second part:

- 1) Visit to KFRI
- 2) Visit to Bambusetum, field research centre (FRC) Velipadam
- 3) Visit to cluster development and livelihood improvement of artisans farmers and bamboo cluster, homesteads and bamboo depots – case study, Thenkurussi Panchayath
- 4) Visit to Angamaly, Athirappally, Vazhachal
- 5) Visit to traditional and modern bamboo industries, Kerala State Bamboo Corporation Ltd. Angamaly

7. Observation

We observed that total growing stock of bamboo resources in the forest areas in Kerala is estimated as 5.25 million tonnes, out of which only 62633 tonnes is collected annually by the Forest Department. In this state *Bambusa bambos* and *Dendrocalamus strictus* are the two major species of bamboo.

Bamboo is preferred as short and fast growing crop which is capable of giving very high yields and rate of returns. Due to heavy biotic pressure, bamboo forests are getting degraded, resulting in declining production and widening supply-demand gaps. Considering its importance in environmental protection, employment and income generation in rural areas and livelihood security of the poor people, the development of this sector merits attention. This necessitates a planned approach to bamboo development.

Books and journals are primary source of information. Bamboo Information Centre- China and Bamboo Information Centre – India are two very good sources of information. Though limited in number, Newsletters and Journals act as good sources of information. Websites information is another major source of information. Experts in the field of bamboo are also good sources of information. Electronic databases, both on line and CDs are very rich resources of information

Bamboo is a viable replacement for wood and industrial raw material for both traditional and modern sectors. The employment potential of bamboo is very high and the major workforce involved are rural poor especially women. About 432 million workdays are provided by bamboo sector annually in India.

Taxonomically, bamboos are considered as one of the most difficult group of plant to identify. Most of the bamboos flower only once in their lifetime and the lifespan varies from 7 to 120 years. The flowers are always not available in bamboo for taxonomic studies, there are several taxonomically useful vegetative parts such as the culm sheath, buds and well developed branch complements that help in identifying the species.

The state government established a stable and reliable policy for the bamboo industry development. For example, it laid down a land-use policy which allows farmers use state-owned land and bamboo housing policy which attempt to reduce the cost of bamboo house building for rural areas.

A policy may be defined as a principle, plan or a course of action as pursued by a government, organization, individual etc. In the aim of policy, the following measures should be included:

- i) Protection and conservation of biodiversity
- ii) Enhancement of resources through promotion of bamboo plantation in forest areas and waste lands
- iii) Promotion of bamboo cultivation in private lands as a commercial crop
- iv) Promotion of bamboo based industries at cottage, small, medium and large scale levels for utilizing the available resources at a sustainable level for generating assured income.

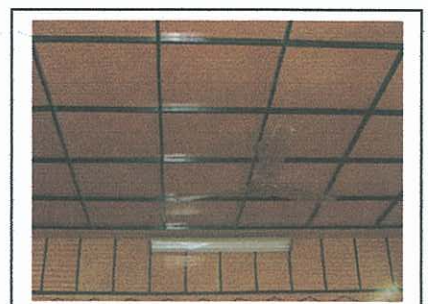
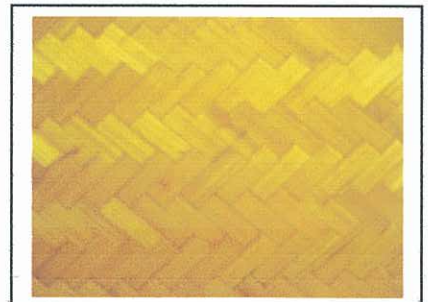
- v) Promotion of traditional sector for producing handicrafts and other valuable added items. Promotion of product diversification and value addition items in the organized sector.
- vi) Improvement of bamboo productivity by use of improved planting stock and scientific management practices
- vii) Promotion of bamboo sector development linked with forestry and agro-forestry to enhance employment opportunities.

In India, modern paper industry has expanded to such an extent that 2.2 million tons of bamboo is used for this purpose. India is investing IRs 26.8 billions for bamboo development during between the years 2004-2008. India has recently manufactured bamboo-corrugated sheets and developed new fabrics using threads of bamboo fibers (70 %bamboo, 20 % silk and 10 % rayon). These facts show increasing commercial importance of bamboo.

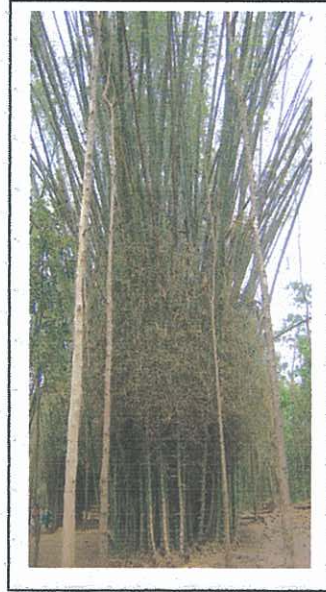
8. Recommendation

- ✓ To develop the bamboo sectors both the industry and rural in a country needs to draw stable policy.
- ✓ To promote the awareness of rural community in sustainable development of bamboo and effective utilization.
- ✓ To find out the proper bamboo forest management necessary to improvement productivity and ease in harvesting.
- ✓ To identify the bamboo species not only local name but also botanical name especially for important bamboo species in Myanmar.
- ✓ To establish the bambusetum in different localities in Myanmar.

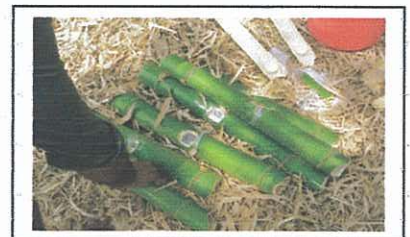
Study on the manufacturing of bamboo-ply



Study on bamboo harvesting and bamboo deport



Study on Bamboo Propagation



(Attached 1)

INBAR-CIBART
International Training Workshop on
Bamboo Propagation, Management and Harvesting:
Methods, Policy Issues and Strategies
27 February - 05 March 2006
Hosted and Facilitated by
Kerala Forest Research Institute (KFRI), Kerala, India

List of Participants

Sl. No.	Name & Address
1.	Mr. S. A. M. Nurul Islam Research Officer, Silviculture Genetics Division, Bangladesh Forest Research Institute, Sholashohar, Post: Amin Jute Mills, Chittagong, Bangladesh. Ph: 088031861572(O) 0880191893987(M) E mail: nislam@abnetbd.com
2.	Mr. Aung Zaw Moe Research Assistant, Forest Research Institute, Yezin, Pyinmana, Myanmar Ph: 095-01-681858, 095-067-416521(O) E mail: friyezin@bagan.net.mm , friygn@mptmail.net.mm
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5.	Mr. Fesseha Demessae Wendemagenhu Industrial Designer, P. O. 6100, Addis Ababa, Ethiopia. Ph: 251-1-4665080(R) E mail: au_bambu@yahoo.com
6.	Mr. Mugisha Bates Nkiriyehe Forest Products & Utilisation Specialist, National Forestry Authority, 10/20 Spring Board, P.O BOX : 70863, Kampala, Uganda. Ph: 0025641-223036516(O) 002560782338493(R) 00256772481549 (M) Fax: 0025641-2230369
7.	Mr. Subhash Patil President, Rayat Udyojak Prashikshan Sansta, C/o House of Patco, Kupwad Rd., Vishrambag, Sangli-416 415. Ph No: 0233-2304471(O), 0233-2301437(R) Fax: 0233-2302182 E-mail: san_patco@sancharnet.in
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(Attached 1)

9.	Mr. Arun Jyoti Nath Research Scholar, Department of Ecology and Environmental Science, Assam University, Silchar, Assam-788 011 Ph: 03842270824(O) 03842270880(R), E-Mail: arunjyothinath@hotmail.com
10.	Mr. Vimal Dhiman, Technical Coordinator, Utaranchal Bamboo and Fiber Development Board (UBFDB), Watershed Management Directorate, Indira Nagar Forest Colony, P.O. New Forest, Dehradun, Uttranchal- 248 006 Ph: 0135-3091538(O), 09412998547(M), Fax: 0135-2760897, E mail: vimaldhiman@rediffmail.com
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13.	Dr. Rajesh Thakur, Scientist C, National Mission on Bamboo Applications(NMBA), TIFAC, 4 th Floor, Vishwakarama Bhawan, Near Katwaria Sarai, Saheed, Jeet Singh Marg, New Delhi-110016 Ph:011-26592763(O), 011-26923300(R), Mob: 09868730293 Fax: 26962267, E mail: rthaku99@rediffmail.com
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15.	Mr. Patras Narzari Managing Director, Bodoland Bamboo Plantations Ltd., Udalguri, BTC, Assam- 784509 Ph: 94351-84434(M)
16.	Mr. T. P. Subramony Resident Manager, INBAR- South Asia Regional Office, I-4, Jangpura – B, New Delhi – 110014 Ph: 0091-11-24374800/01(O), 0091-11-22718342(R), 098107-22209(M) Fax: 0091-11-24374802, E mail: subramony@inbar.int
17.	Mr. S. Anand, Systems & Logistics Officer, INBAR, I-4, Jangpura-B, New Delhi Ph: 011-24374800(O) 9873075588(M) E mail: anand@inbar.int

(Attached 2)

INBAR-CIBART
International Training Workshop on
Bamboo Propagation, Management and Harvesting:
Methods, Policy Issues and Strategies
27 February - 05 March 2006
Hosted and Facilitated by
Kerala Forest Research Institute (KFRI), Kerala, India

Programme

Time	Activity
Sunday, 26 February 2006	
Whole day	Arrival & Accommodation
Day – 1. Monday, 27 February 2006	
09.00 - 09.30 AM	Registration of participants
09.30 - 09.40	Welcome – <i>Dr. J. K. Sharma, Director</i>
09.40 – 10.00	Briefing about the workshop - <i>Dr. KK Seethalakshmi</i>
10.00 - 10.15	Tea Break
Technical Session 1 – Sympodial Bamboos - an overview	
10.15 - 11.00	Introduction to Bamboos - <i>Dr. Muktesh Kumar</i>
11.00 - 12.00	Taxonomy and identification of important bamboo species - <i>Dr. Muktesh Kumar</i>
12.00 - 1.00 PM	Flowering of bamboos and management of flowered bamboos - <i>Dr. K. K Seethalakshmi</i>
01.00 - 02.00	Lunch Break
Technical Session 2 – Information sources and remote sensing	
02.00 - 02.45	Information Sources on Bamboos – <i>K. Sankarapillai</i>
02.45 – 03.30	Growing stock Estimation using Remote Sensing - <i>Dr. P. Vijayakumaran Nair</i>
03.30 – 03.45	Tea Break
03.45 - 04.15	Visit to Bamboo Information Centre - <i>N. Sarojam</i>
04.15 - 05.00	Visit to KFRI Library - <i>K. H. Hussain</i>
05.30 - 09.30	Thrissur Town Trip, Dinner in the Town and Return to Hostel
Day – 2. Tuesday, 28 February 2006	
Inaugural Session	
09.30 – 09.35 AM	Welcome Address - <i>Dr. J. K. Sharma, Director, KFRI</i>
09.30 – 09.40	INBAR – KFRI Training Programme on Bamboos – <i>Sri. T. P. Subramony, INBAR</i>
09.40 – 09.50	Presidential Address – <i>Sri. P.P. George, MLA</i>
09.50 – 10.05	Inaugural Address – <i>Sri. A. Sujanapal, Hon'ble Minister for Forests & Environments, Government of Kerala</i>
10.05 – 10.20	Keynote Address – <i>Sri. C. P. John, Member, Planning Board and Vice- Chairman, Kerala Bamboo Mission.</i>

(Attached 2)

10.20 – 10.30	Vote of Thanks – <i>Dr. K. K. Seethalakshmi, Workshop Coordinator</i>
10.30 – 10.45	Tea Break
Technical Session 3 - Flowering of bamboos and propagation	
10.45 – 11.30	Seed Handling and Seedling Production - <i>Dr. K. K. Seethalakshmi</i>
11.30 – 12.15	Micro-propagation of bamboo – <i>Dr. E. M. Muralidharan</i>
12.15- 01.00 PM	Seed and Conventional Vegetative Propagation - <i>Dr. K. K. Seethalakshmi</i>
01.00 - 02.00	Lunch Break
Technical Session 4 - Nursery and plantation establishment and management	
02.00 – 02.45	Nursery and Plantation Techniques for bamboos - <i>Dr. R. C. Pandalai</i>
02.45 – 03.30	Site Requirement and Fertilizer Management in Nurseries and Plantations - <i>Dr. Thomas P. Thomas</i>
03.30 – 04.00	Tea Break and Photo Session
04.00 – 04.45	Pest management in Bamboo nurseries and Plantation - <i>Dr. RV Varma</i>
04.45 – 05.30	Disease management in Bamboo nurseries and Plantations - <i>Dr. C. Mohanan</i>
Day 3. Wednesday, 1 March 2006. Field Trip 1. KFRI Field Research Centre, Veluppadam	
08.00 – 09.00 AM	Travel to FRC
09.00 – 10.30	Visit to Bambusetum - <i>Dr. RC Pandalai & KK Unni</i>
10.30 – 11.00	Tea Break
11.00 – 12.00	Vegetative Propagation and Nursery Establishment – Demonstration – <i>Dr. K. K. Seethalakshmi & V. P. Raveendran</i>
12.00 – 01.00	Travel to KFRI, Peechi
01.00 – 02.00	Lunch Break
02.00 – 03.00	Visit to Tissue culture Laboratory and Demonstration - <i>Dr. E. M. Muralidharan</i>
03.00 – 03.15	Tea Break
Technical Session 4 - Nursery and plantation establishment and management (Contd...)	
03.15 – 04.00	Harvesting and Clump Management - <i>Dr. RC Pandalai</i>
04.00 – 05.00	Visit to Seed Centre - <i>Dr. RC Pandalai</i>
Day – 4. Thursday, 2 March 2006	
Technical Session 5 – Post-harvest Technology and Machineries	
9.30 – 10.15 AM	Preservative treatments for bamboos - <i>Dr. R. Gnanaharan</i>
10.15 – 11.00	Bamboo Processing Machineries - <i>Dr. T. K. Damodaran</i>
11.00 – 11.15	Tea Break
11.15 – 12.00	Demonstration: Bamboo Processing and Preservation - <i>Dr. R. Gnanaharan and Dr. TK Dhamodaran</i>

(Attached 2)

Technical Session 6 – Environmental aspects	
12.00 – 1.00	Environmental aspects of bamboo - <i>Dr. S. Sankar and Dr. MP Sujatha</i>
1.00 – 2.00	Lunch Break
Technical Session 7 –Policy and Legal Issues	
2.00 – 2.45	Bamboo Policy and Legal Issues – <i>Dr. P. K. Muraleedharan</i>
2.45-3.30	Interaction with Participants and Presentation
3.30-3.45	Tea Break
3.45-5.30	Interaction with Participants and Presentation
Day – 5. Friday, 3 March 2006	
Field Trip 2. Visit to Vazhachal, Athirapally and Bamboo Corporation, Angamaly	
8.30 AM - 8.30 PM	Visit to Angamaly, Athirappally, Vazhachal - <i>Dr. K.C. Chacko, Dr. P. Vijayakumaran Nair, Dr. Muktesh Kumar, Mr. VP Raveendran</i> Traditional and Modern Bamboo Industries - <i>Mr. N. C. Balakrishnan, MD, Kerala state Bamboo Corporation Ltd. Angamaly</i> – Presentation at Kerala Bamboo Corporation, Angamaly
Day – 6. Saturday, 4 March 2006	
Field trip 2. Bamboo cluster, Homesteads and Bamboo depots	
8.00 – 1.00	Cluster Development and Livelihood Improvement of Artisan Farmers – Case Study, Thenkurussi Panchayath – <i>Dr. Sankar, Dr..K. K. Seethalakshmi and Dr. R. C. Pandalai</i> Visit to Bamboo Cluster, Homestead and Bamboo Depots at Thenkurussi Panchayath, Palakkad - <i>Dr. S. Sankar and Dr. C. N. Krishnankutty</i>
1.00 – 2.00	Lunch Break
2.00 - 3.15	Visit to KFRI Facilities and Interaction with Scientists
3.15 – 3.30	Tea Break
3.30 – 4. 30	Evaluation and Valedictory Function
Day – 7. Sunday , 5 March 2006	
Whole day	Departure of Participants