TRANSFER OF TECHNOLOGY MODEL

BAMBOO MAT BOARD PRODUCTION UNIT

INTERNATIONAL NETWORK FOR BAMBOO AND RATTAN

Why bamboo?

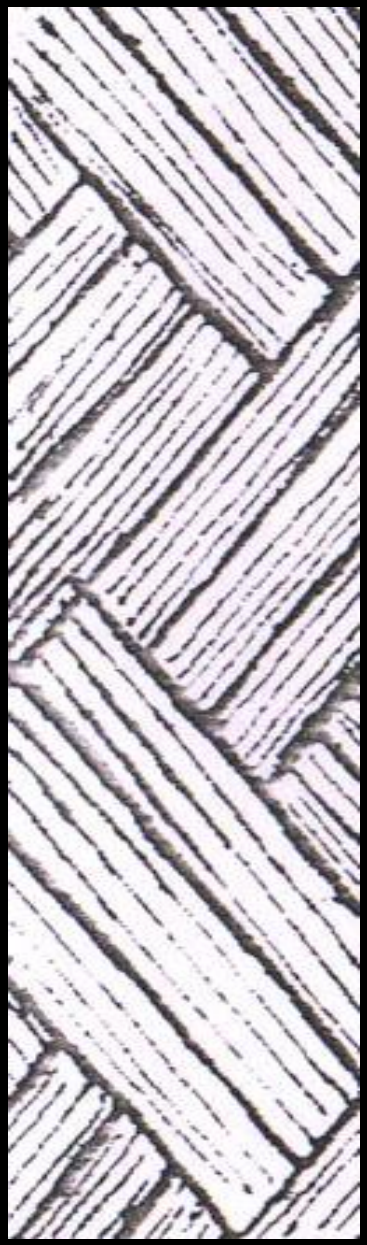
- **Bamboos** grow more rapidly than trees and start to yield within three or four years of planting.
- **Plantation** establishment requires minimal capital investment and builds upon the inherent plant-cultivation skills of local farmers and foresters.
- **Bamboos** can be harvested annually and non-destructively.
- **Bamboos** are excellent for rejuvenating degraded lands and protecting against soil erosion.
- **Bamboos** may easily be intercropped with shallow-rooted crops.
- As well as the culms, all other parts of the bamboo plant can be used in rural livelihoods - shoots for food, leaves for fodder, and branches for items such as brooms and for firewood.

What is bamboo mat board?

- **Bamboo mat board** is a plywood-like wooden board made from layers of woven bamboo mats that have been coated with glue and then pressed firmly together.

- **Bamboo mat board** has similar properties to plywood and can be used for paneling, housing, doors, furniture and household utensils. It is more flexible than plywood and can be used for stressed skin panels and wall bracings for which plywood is not suitable. It is also very suitable as concrete formwork.

- **Bamboo mat board** is attractive, very durable, highly resistant to insect and fungal attack and as fire resistant as fire retardant-treated plywood.



How is bamboo mat board produced?

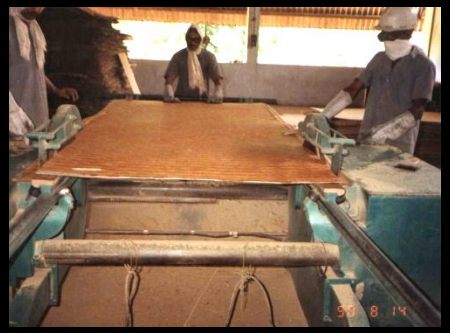
1. Bamboos are split into thin slivers

2. Slivers are woven into mats

3. Mats are soaked in adhesive resin then allowed to drain

4. Mats are dried in a hot air chamber

5. Mats are pressed together under high temperature and pressure to form boards



6. Boards are trimmed to shape

Main development attributes of a bamboo mat board unit

- Reduces dependence on timber resources through wood substitution.
- Permits rehabilitation of degraded lands through increased areas of bamboo plantations.
- Creates employment opportunities for unskilled, semi-skilled and technically-trained staff at the factory and for mat weavers.
- Increases community welfare and improves local rural economies if established as a community enterprise.
- Mat weaving can be done at home and is ideally suited for women who may be unable to leave their homes for much of the day.

Some salient facts

- Mat board production in India is reviving the tribal areas and generating over 2.5 million workdays annually, mostly in mat weaving.
- For the five years to 1997 demand for mats by mat board factories was such that the price paid for individual mats increased from 17 Rupees to 55 Rupees each.
- It is estimated that 8,000 ha of natural forest could be saved from logging if one quarter of the country's plywood production is replaced by bamboo mat board.
- This would generate an estimated 66 million workdays for weavers.

Requirements for success

- Sustained availability of bamboos suitable for mat-making.
- Availability of skilled bamboo weavers, or people willing to be trained.
- Coordinated means of transporting bamboos to decentralised weavers and mats from weavers to the factory.
- Inexpensive labour for the factory itself.
- Regular supply of electricity for the factory.
- Start up capital.
- Suitable marketing mechanisms for sale of boards.
- Finally, an innovative approach to developing new applications for mat board would help maintain market position.

In Practice - an example: The Kerala State Bamboo Corporation (1)

- Was established in the early 1970s to benefit the bamboo harvesters and weavers in the state of Kerala, India.
- Is a government owned enterprise.
- Established a mat board factory in 1985.
- Directly benefits 100,000 bamboo workers in the State, which is about one third of the total number of bamboo workers in Kerala. .

Photo: Automatic mat drying machine

Main reference for this and the following slide: www.bambooworldindia.com

In Practice - an example: The Kerala State Bamboo Corporation (2)

- Is licensed to harvest annually 30, 000 tonnes of *Ochlandra travancorica* from state forests.
- Has 2500 registered bamboo collectors who sell directly to the corporation.
- Has nine bamboo collection centres and 100 depots for distributing bamboos to weavers for mat weaving.
- Has 60, 000 registered weavers who supply the mat board factory and who make their livelihoods from this activity.

Photo: Table made from mat board

Main reference for this and the previous slide: www.bambooworldindia.com

Capital investment required for a unit capable of producing 129, 000 sheets per year

	Approximate cost in US Dollars
• Equipment and Machinery	180, 000
• Land and Buildings	92, 000
• Working Capital Margin	100, 000
• Preliminary and Pre-operative costs	65, 000
• Contingencies	300
• TOTAL	437, 300

***Note**: factories with smaller capacities can be established for considerably less.*

Profitability of the mat board unit

Total manufacturing costs per square metre	US$ 3.03
Estimated selling price per square metre	US$ 3.40
Break even point	75% of capacity
Gross return on investment	56.75%
Net return on investment	18.80%
Total return on investment	21.25%
Payback period	**5 Years**

For further information

See

TOTEMs

Mat board TOTEM

Bamboo roofing sheets TOTEM

Splitting and slivering unit TOTEM

Website

IPIRTI: www.bamboocomposites.com

Book

Bamboo Panel Boards - A State of the Art Report, INBAR, 1996. (text file available at www.inbar.int).

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