

A photograph showing two men working with a large, red, industrial machine. The machine is a press that creates corrugated bamboo roofing sheets. One man, wearing a green cap and a light-colored long-sleeved shirt, is on the left, holding the edge of a sheet. The other man, wearing a green t-shirt and blue pants, is on the right, also holding the edge. The sheet is a light brown color with a distinct wavy, corrugated pattern. The machine has several rollers and a large red frame. The background is a weathered, grey wall with some windows. The overall scene is outdoors, likely in a workshop or factory setting.

**TRANSFER OF TECHNOLOGY MODEL**

# **CORRUGATED BAMBOO ROOFING SHEETS**

**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 are corrugated bamboo roofing sheets?

- **Corrugated bamboo roofing sheets** are plywood-like roofing materials made from layers of woven bamboo mats that have been coated with glue and then pressed firmly together. The corrugations are formed by pressing the mats between corrugated pressing plates.
- **Corrugated bamboo roofing sheets** are an excellent alternative to asbestos, iron, zinc or plastic roofing sheets. They are attractive, durable and highly resistant to adverse weather conditions and pest attacks.
- **Corrugated bamboo roofing sheets** can be produced in a variety of sizes and used to roof a wide range of buildings.



# How are roofing sheets produced?



1. Bamboos are split into thin slivers



2. Slivers are woven into mats



3. Mats are soaked in adhesive resin



4. Mats are allowed to drain and dry



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



6. Sheets are trimmed to shape and may then be painted

## Main development attributes of a roofing sheets 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.
- **Creates** significant employment opportunities for mat weavers.
- **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.
- **Increases** community welfare and improves local rural economies if established as a community enterprise.
- **Is labour, not capital, intensive** and helps develop the small scale industry sector in rural regions.

## Some salient facts

- A unit capable of producing half a million square metres of roofing sheet per year will create **employment for 200 people**, mostly female weavers.
- The **environmentally-friendly nature** of bamboo roofing sheets increases greatly their potential export markets in well-developed countries.
- Corrugated roofing sheets can be produced at a **standard matboard factory** simply by using a hot press with changeable pressing plates. This increases the range of products produced at the factory and improves the sustainability of the business.



## 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.
- Suitable marketing mechanisms for the sale of sheets.
- Start up capital.



## Financial aspects

(based on costs in Vietnam)

- Start up capital for purchase of equipment **\$17, 000**
- Cost of producing one corrugated bamboo roofing sheet, 0.8 x 0.2 m, in a factory with a capacity of 500, 000m<sup>2</sup> per annum **\$ 1.95**
- Selling price in Vietnam **\$ 2.17**
- Pre-tax profit per sheet **\$ 0.22**  
(11% of production costs)



# For further information

## See

### TOTEMs

Bamboo roofing sheets TOTEM  
Splitting and slivering unit TOTEM  
Matboard TOTEM  
Low cost housing TOTEM

### Website

IPIRTI: [www.bamboocomposites.com](http://www.bamboocomposites.com)

### Book

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

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