A photograph of a man in a red vest and light shirt operating a mechanical device to process bamboo. The device is a small, hand-cranked machine with a hopper for bamboo and a collection tray. The man is crouching and using a foot pedal to operate the machine. The background shows a simple building and some bamboo plants. The scene is outdoors and brightly lit.

TRANSFER OF TECHNOLOGY MODEL

**BAMBOO PRESERVATION BY SAP
DISPLACEMENT**

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.

Why preserve bamboos by sap displacement methods?



- **Bamboos** are a natural material and will decay with time. They are also susceptible to insect and fungal attack.
- **Preserving bamboos** increases the durability of the culms and increases the lives of the products they are used to produce. It also increases the safety of any structures in which they are used as load bearing members. Preserved bamboos need to be replaced less often which reduces costs in the long term.
- **Sap displacement methods** replace the sap in the vessels of fresh bamboos with preservative. The techniques are rapid and efficient, require minimal equipment, and the preservation mixture can be recycled.

What are the main sap displacement methods?



1. **Simple sap displacement:** The basal ends of the bamboo are immersed in preservative for 24 - 48 hours. The bamboos are then turned upside down and the apical ends similarly immersed.
2. **Modified Boucherie process:** Preservative is pumped through the bamboo from the basal end. Bamboos are then stored for two weeks for the preservative to diffuse into all the cells.
3. In the **conventional Boucherie process** the preservative tank is held above the bamboos and the preservative passes through by gravity.

Main development attributes of a sap displacement preservation unit

- **Reduces** dependence on timber resources and thereby increases environmental protection and conservation.
- **Permits** rehabilitation of degraded lands through increased areas of bamboo plantations.
- **Creates** income-generating opportunities for bamboo growers who will supply the unit, and employment for unskilled and semi-skilled workers at the unit.
- **Requires** minimal capital investment to establish.
- **Promotes** greater acceptability of bamboo, with consequent benefits for all aspects of the community involved with bamboo.

Some salient facts

- Bamboo culms have a **life of only three years** once severed from the plant, and often much less.
- Sap displacement techniques are only suitable for **preserving fresh bamboos**, so the unit should be established no more than one day's travel from a bamboo forest.
- As a **primary processing activity** the preservation unit is ideally established as one of the central core units in a broader, community-based, bamboo development programme, along with a bamboo splitting and slivering unit and a bamboo propagation unit.
- Preservation of bamboo is an **intermediate stage** between cultivation and final processing and requires good linkages to the final processors.
- Treated bamboo can be sold for up to **double** the price of untreated bamboo.

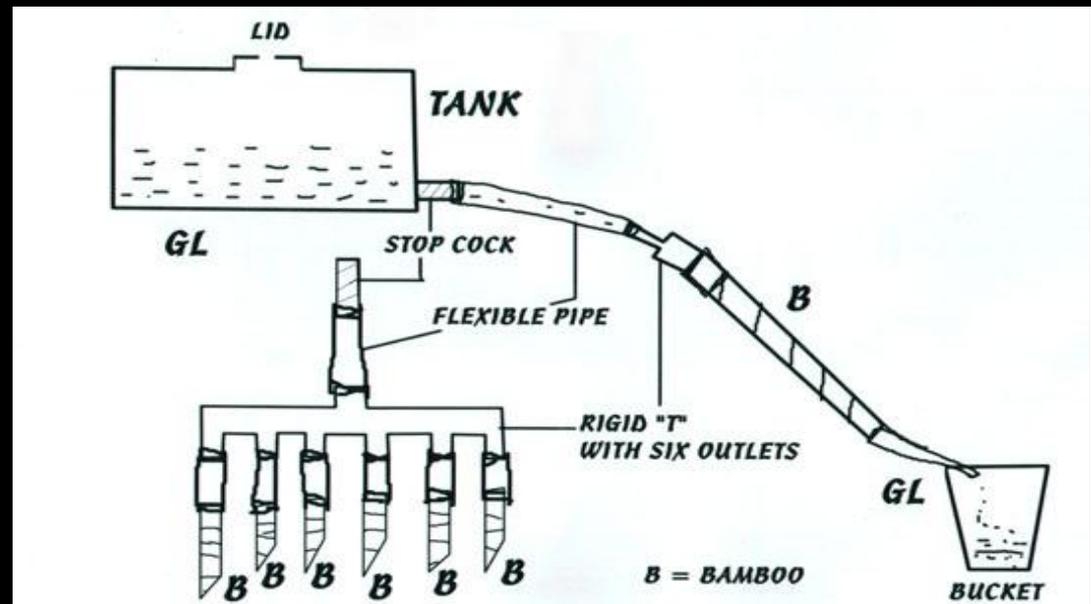


Photo: Demonstrating the conventional (or simple) Boucherie technique

Requirements for success

- Sustained **supply** of **fresh bamboos** within one day's travel of the unit.
- Some **technically-trained personnel** to manage and maintain the unit.
- A small amount of start up **capital**.
- Proper **linkages** to the users of the treated culms.

Right: Schematic diagram of the conventional Boucherie process.



Financial aspects of a sap displacement unit

START UP COSTS (US Dollars)

- Steel drum for **steeping** and **sap displacement**. \$5
- Steel tank for **diffusion** or masonry tank for **diffusion**. \$500
\$200
- **Boucherie** equipment. (for 50 bamboos at a time) \$500

RUNNING COSTS

- Bamboo purchase 10-15 cents/m
- Treatment cost 5-8 cents/m

Additional cost of treating bamboo: 15-20%

Increase in service life of treated bamboo: 3 - 5 times



Above: Hut made of treated bamboo.

For further information

See

TOTEMs

Village bamboo preservation unit.
Rattan oil curing, bleaching and preservation.

Websites

INBAR: www.inbar.int

IWST Bangalore: www.iwst.res.in

Books

**Bamboo Preservation Techniques -
A Review. 1994.**

By Sathish Kumar, K.S. Shukla, Indra Dev,
P.B. Dobriyal. Published by INBAR / ICFRE
(available as text file at:

<http://www.inbar.int/publication/publmain.asp?catecode=pp>)

Contact

- **INBAR**, Beijing 100101-80, China
- **Institute of Wood Science and technology (IWST)**, 18th Cross, Malleswaram, Bangalore, 560 003, India

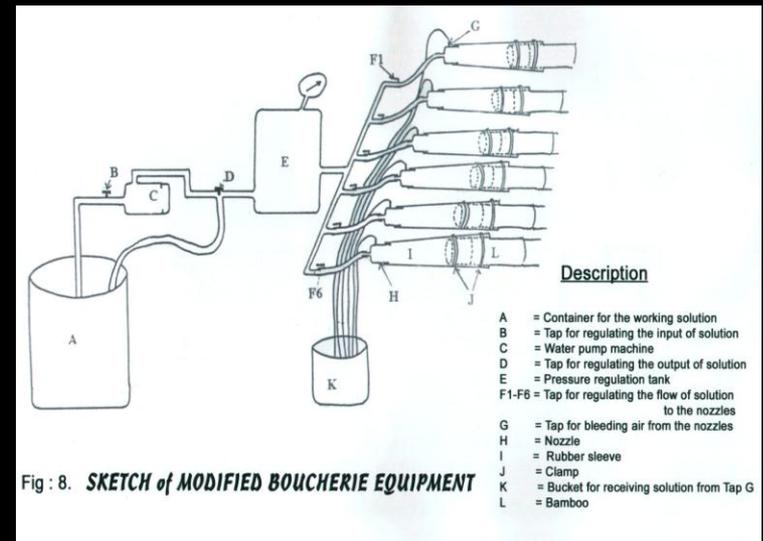


Fig : 8. *SKETCH of MODIFIED BOUCHERIE EQUIPMENT*