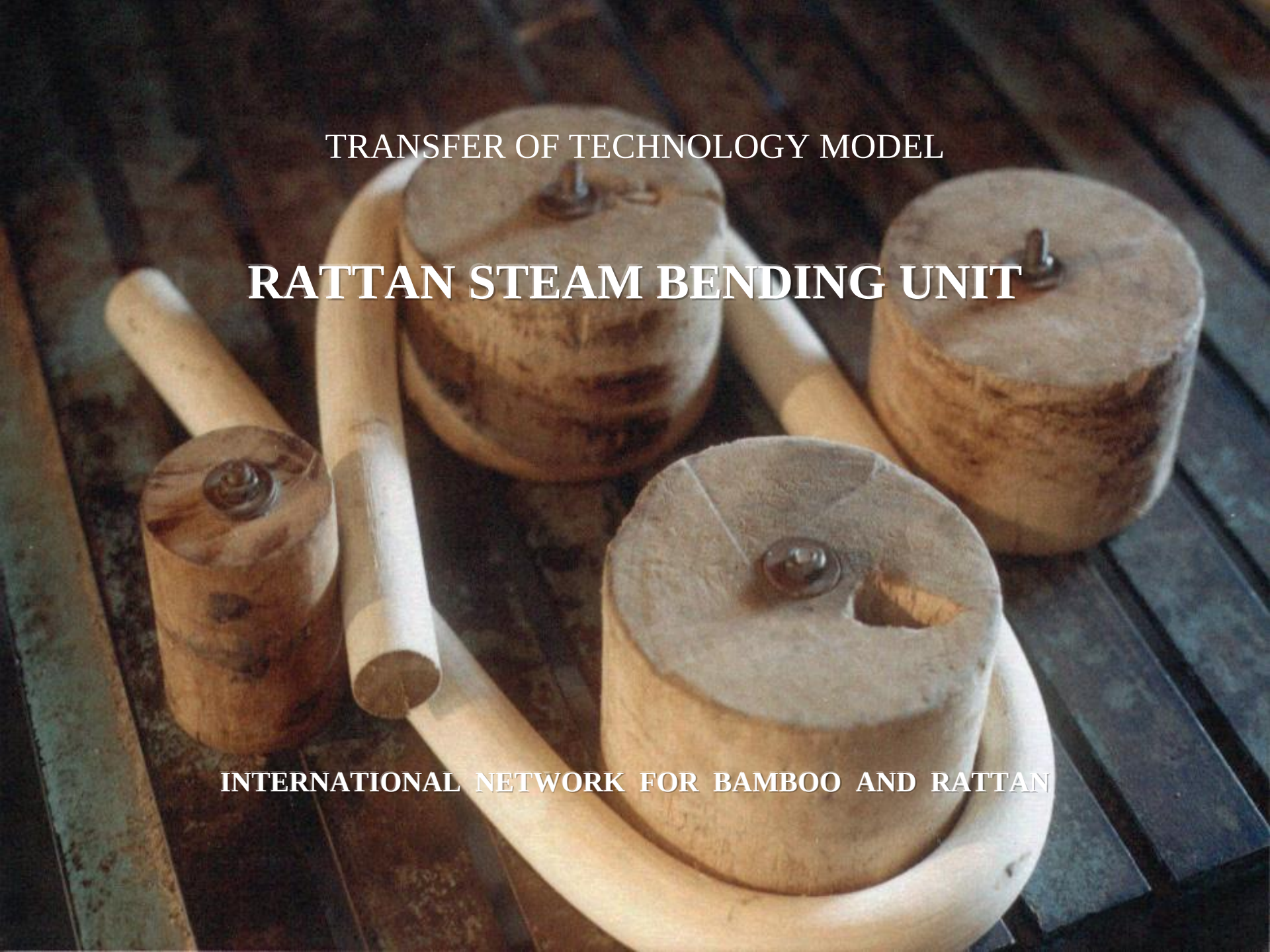


The image shows four cylindrical wooden blocks, each with a metal bolt in the center of its top face. These blocks are arranged on a dark, textured surface. A long, light-colored wooden rod is positioned diagonally across the blocks. A curved piece of light-colored wood is draped over the front-most block. The lighting is warm, highlighting the textures of the wood and metal.

TRANSFER OF TECHNOLOGY MODEL

RATTAN STEAM BENDING UNIT

INTERNATIONAL NETWORK FOR BAMBOO AND RATTAN

Why rattan?

- **Rattan** grows up trees for support and helps save them from premature harvesting by providing additional benefits that outweigh those of early harvesting the companion tree.
- **Rattan** can be planted in natural forests without disturbing the existing structure or balance of the forest and can increase its financial value.
- **Rattan** poles are light and extremely flexible and have a huge market in the furniture and handicraft industries. In order to guarantee future supplies, rattan plants must be properly managed and sustainably harvested.

Why steam bend rattan poles?

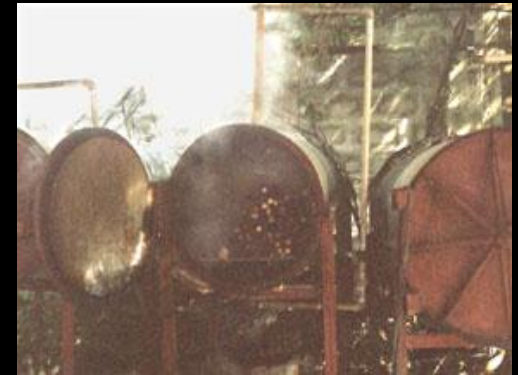
- **Rattan poles** are very widely used in the furniture industry because of their strength and pliability. They can be bent to tight radii down to four times the diameter of the pole and are used to form many parts of the furniture framework.
- **Rattan poles** are traditionally bent with a blowtorch. This leaves unsightly scorch marks on the poles and consequently reduces the quality and sale price of the products.
- **Steam bending** eliminates these problems. Heating with steam also softens the whole length of the pole at one time, allowing greater lengths to be bent, and involves fewer labour inputs.



How are poles steam bent?



1. Poles are straightened using straightening jigs. 2. Poles are selected and graded



3. Poles are steamed for 20 minutes.



4. Poles are bent to shape and tied in jigs.



5. Poles are left for 24 hours for the bend to set.



6. Bent components are trimmed ready for use in furniture making.

Main development attributes of a steam bending unit

- **Reduces** dependence on timber resources and thereby increases environmental protection and conservation.
- **Permits** rehabilitation of degraded lands through increased areas of rattan plantations.
- **Creates** income-generating opportunities for rattan growers who will supply the unit, and employment for unskilled, skilled and technical staff at the unit.
- **Uses only** waste rattan to heat the boiler that produces the steam and is very energy-efficient.
- **Can be established** as a central community enterprise to supply a wide range of different secondary rattan processing enterprises.

Some salient facts

- As a **primary processing activity**, the steam bending unit is ideally established as one of the central core units in a broader community-based rattan development programme, along with a rattan oil curing, bleaching and preservation unit and a propagation unit.
- The use of **jigs** is very important to ensure uniformity of the bent components.
- Maintaining **close linkages** to, and regular feedback from, the users of the bent components (who are the “market” for the components) is essential to ensure the unit is able to meet industry requirements.
- Steam bending requires **skilled operators** and a programme of skills development coupled with staff promotion will maintain the vitality of the unit.



Photo: Steamed poles awaiting bending in jigs

Requirements for success

- Sustained **supply** of quality poles.
- Some **skilled bending technicians**.
- Start up **capital**.
- Sets of bending **jigs** to ensure uniformity of components and minimise breakage.
- Well established **linkages** to the secondary processors who are the “market” for the bent parts produced.



Left: Steam bent pole in jig.



Right: Split and cracked poles due to improper bending.

Start-up costs of a steam bending unit

- | | |
|--------------------------------------|---------------|
| • Steam conditioning equipment | \$8250 |
| • Other equipment (jigs, hand tools) | \$1275 |
| • TOTAL | <u>\$9525</u> |

Notes:

- A number of different sizes of steaming chests are required for different lengths of poles.
- Storage facilities for purchased poles after selection for quality and prior to bending, and for those being set after steaming will be required.
- The unit should be designed to allow free and clear access to the steaming chests by all pole-benders



For further information

See

TOTEMs

Rattan Steam Bending

Rattan Oil Curing, Bleaching and Preservation

Rattan Furniture Making

Community-Based Woven Rattan Products

Contact

- **INBAR**, Beijing 100101-80, China
- **FPRDI**, College St., Laguna 4031, Philippines.

Websites

INBAR - www.inbar.int

FRPDI - www.fprdi.uplb.edu.ph

Photo: Drying rattan cores

