Bamboo Fishing Rod

Location	Nalchar block, South Tripura district, Tripura State, India
Suitability	Self-help groups, individual entrepreneurs, households
Benefits	Poverty alleviation – Generates cash income – Gender neutral
Level	Household, micro enterprise
Capacity	135,000 units per year
Keywords	Bamboo – Fishing rod

Introduction

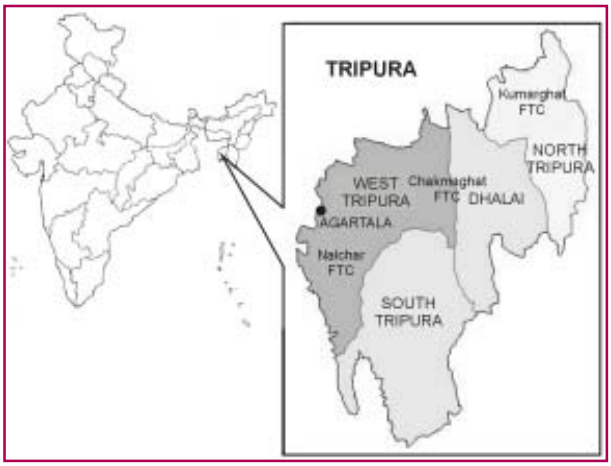
Tripura, one of the eight states of Northeast India, is the smallest state of the region and the second most populous state after Assam, with a total population of about 3.19 million, as per 2001 Census. The state is divided into four districts – North Tripura, South Tripura, West Tripura and Dhalai. Nearly two-thirds of the area is hilly, leaving very little cultivable land to meet the requirement of burgeoning population of the state.

States like Tripura have a sizeable number of artisans whose traditional working materials include bamboo. These bamboo articles often mean the difference between starvation and one square meal. In Tripura, bamboo handicrafts form a sizeable chunk of the rural economy. Ethnic communities in the state produce a wide range of articles from bamboo, both for household use as well as for selling for returns in cash or kind. Bamboo fishing rod is one such item. It is used in inland subsistence and game fishing.

The Enterprise

Fishing rods production has the potential to develop into an industry that caters to export markets, particularly considering the renewed interest in bamboo fishing rods among anglers. Making bamboo fishing rods is therefore being promoted by the Tripura Bamboo and Cane Development Centre (TRIBAC), a non-profit organization set up by the Centre for Indian Bamboo Resource and Technology (CIBART). TRIBAC views such technologies as a means for ensuring sustainable alternative livelihood patterns in regions of Tripura.

The process documented is practiced by a five-member self-help group that produces bamboo fishing rods with technical assistance and training support from TRIBAC. The enterprise has a capacity to produce 135,000 fishing rods per year, considering 300 workdays of one 8-hour shift each.



The Process

The process of making fishing rod is basically traditional, with some adaptations for better finish. Poles of the bamboo species *Bambusa affinis* are first cross-cut to the required length – 5 feet – using a saw. These rods are sun-dried, and straightened heating on a hearth. Some finishing treatments are then applied to complete the fishing rod.

Beneficiaries

The main beneficiaries are self-help groups (SHGs), which often operate in an informal set-up from households. Income earned from the activity often forms the difference between abject poverty, particularly in lean months when agriculture is not an option. Most of the people engaged in the activity are also socially backward class.

Key Financial Data

Cost price per fishing rod	: INR 2.14
Sale price per fishing rod	: INR 4.00
NPV of the enterprise	: INR 1,113,755.00
IRR	: 441%
Benefit-cost ratio	: 1.91

Cost of land is not taken into the calculations; it is assumed that the enterprise has the required land at its disposal. Cost of raw material (bamboo) works out to INR 1.67 per pole. Marketing or transportation costs are not factored in, as the buyers pick up the product from the production site. The rest of the production cost is mostly labour charges, which accrues to the producers (SHGs). The actual earning, therefore, is much more than the INR 1.86/rod profit.

Exchange rate: US$1 = INR 46

Scraping off the nodes on the bamboo pole

Costs for the enterprise include as fixed capital one-time cost of INR 2,500 towards tools, and annual operating cost of INR 57,704.00 towards costs of materials and labour. Annual sales turnover is INR 54,000, earning a net profit of INR 250,478 per year.

Key Benefits

- Livelihood creation and poverty alleviation.
- Production can be carried out in households.
- Very low capital investment.
- Possibility of exports.

Key Requirements

- Adequate availability of bamboo at a reasonable cost.
- Rent-free premises to operate from.
- Regular demand for the product.
- Acceptability of the quality in the marketplace.

The Environment

Tripura, one of the seven sister states of Northeast India, is not only the smallest state of the region but also the third smallest state in the country with a geographical area of 10,491 sq. km. The state is situated in the south-western extremity of Northeast India. Nearly two-thirds of the area is hilly, leaving very little cultivable land to meet the requirement of burgeoning population of the state. Despite being geographically the smallest state in the Northeast region, Tripura is the second most populous state after Assam, with a total population of about 3.2 million and a population density of 305 per sq. km. While Tripura's population density is lower than the all-India level (324), its per capita net sown area of 0.214 acre is 1.5 times lower than the all-India level (0.343 acre). This points to the growing population pressure on limited arable land resource of the state.

The sex ratio is 948 (all-India 933). Much of the growth is attributed to migration factors. Urban population is less than 18 percent of the total, reflecting the rural and agrarian dominance on the state economy. There are 19 tribes, the major among them are *Tripuri, Chakma, Reang, Halam, Jamatia, Mog, Noatia, Kuki, Garo* and *Lushai.*

The aerial extent of the state ranges from 22º 56' to 24º 32' North latitude and 91º 09' to 92º 20' East longitude with the Tropic of Cancer passing through it. While Assam and Mizoram share its eastern boundary, Bangladesh surrounds it on three sides through a boundary of 856 km (almost 85 percent of its perimeter). For this reason, Bangladesh plays a large role in the development of Tripura, as a consumptive market and even influencing the social fabric of the state. Geographically, Tripura is in relative isolation from the rest of India owing to: (a) Physical distance from rest of India; (b) Post-Independence closure of relatively short routes through Bangladesh; and (c) Inadequate development of rail and road transport facilities.

At present, there are four administrative districts in the state – West Tripura, South Tripura, North Tripura and Dhalai. Agartala is the capital of Tripura. There are 15 sub-divisions in the state. Besides, there are 38 blocks, 874 revenue mauzas – out of which 856 are revenue villages – 12 town panchayats and six census towns. This apart, Agartala Municipal Council (AMC) area consists of 17 municipal wards. Moreover, there are 962 village panchayats.

Heating the bamboo rod on a hearth

Agartala is connected by road with Guwahati via Shillong by National Highway No. 44, known as Assam-Agartala Road, which is the only road link with the rest of India and is the lifeline for Tripura. The National Highway is now being extended up to Sabroom, which is the southern-most point of Tripura. All districts and sub-divisions are well connected by all-weather roads.

The state capital Agartala is well connected by air with Calcutta and Guwahati. The flights from Guwahati and Calcutta take hardly 45 minutes to reach Agartala. The state has three more small airports at Khowai, Kamalpur and Kailashahar.

Tripura is also connected by rail via Guwahati and the railway station nearest to the capital city is at Kumarghat (in the North District of the state), which is 140 km away from Agartala. The total length of railway track from Dharmanagar to Kumarghat is only 44.72 km. This rail line will be extended to Agartala by 2005.

The power sector in the state is only beginning to develop. Although Tripura has one of the lowest power tariffs in the country, power shortage, particularly for industrial application, is a reality as the state has a power deficit of 14 percent. The state's significant natural gas deposits are yet to be tapped systematically.

Though all regions of Tripura are not homogenous in their socio-economic or physical characteristics, the hill habitations of Tripura are at par in their low level of development. They are overwhelmingly rural areas, with workforce predominantly engaged in primary activities (64 percent) and the manufacturing sector (6.41 percent of workforce) lagging far behind. About 66.8 percent of the rural people are under the poverty line. The per capita State Domestic Product (SDP) is very low (INR 10,231 compared with INR 15,541 National Domestic Product of in 1999-2000).

Rice is the major crop, as it is well suited to the marshy conditions of the northern basin. Sugar cane, mustard and potatoes are also grown. Main cash crops are jute, cotton, tea and fruits. The agricultural production is not sufficient to meet the needs and the state imports large quantities of rice, wheat, maize, pulses and sugar to cover the shortfall. Main export items from the state include plywood pulp, bamboo and rattan articles, timber and canned fruits. Shifting cultivation by slashing and burning of forests (locally called *jhum*). About 35,000 to 40,000 ha of forestland is annually cleared for this. As per the Task Force on Shifting Cultivation, about 17.7 percent of the forest area is affected by shifting cultivation by 40 percent of the tribal population.

According to the Forest Survey of India, the forest cover in Tripura constitutes 54.76 percent of the total geographical area, up from the 52 percent in 1997.

Straightening the bamboo rod on a jig

The types of forests are: evergreen forests, moist deciduous forests, swamp vegetation, bamboo forests, rattan brakes, dipterocarpus forests, savannah and grassland vegetation.

According to Tripura's State Forestry Action Plan, the bamboo resources cover an area of about 2,397 sq. km, which includes areas under shifting cultivation. Another 109 sq. km outside the forest areas is estimated to have smallholdings of cultivated bamboo. Apart from this, almost each rural house has at least one homestead bamboo clump. Tripura has about 26 species/varieties of bamboos belonging to the genera *Bambusa, Dendrocalamus, Gigantochloa, Melocanna, Melocalamus, Neohouzeaua, Oxytenanthera, Schizostachyum,* etc. Although most of the species grow naturally and are found in abundance in the forests, *Melocanna baccifera* (Muli) and *Bambusa tulda* (Mritinga) are the most widespread and *M. baccifera* is the most used. There are plantations both in the public and the private sectors, and there have been several planting initiatives recently to raise *D. strictus* and *B. bambos* plantations using tissue-cultured plantlets.

Bamboo has been, and continues to be, an integral part of Tripura's ecology and economy. It is an essential housing material for over a million of the rural poor in the state, and also serves as a widely used material for furniture making. A large number of houses, warehouses, granaries, shops and workspaces have been built using bamboo as the main construction material. Besides bamboo posts and structural members, bamboo culm is also used – split and flattened – as flooring material, walling material, as well as for doors. It is not uncommon to see even thatching made of bamboo leaves. Bamboo culms are used also to construct field and house fences, and also form an important component in the religious and cultural practices of the tribal people.

Bamboo handicrafts from Tripura are immensely popular throughout India and form a sizeable chunk

of the rural economy. Tripura is famous for its bamboo screens made from split bamboo, so finely woven that they look almost like ivory. Bamboo matting is another thriving industry in the state. The bamboo sector also supports industries that produce paper and incense sticks (*agarbatti*). Bamboo shoots (known locally as *Korul* or *Muiya*) are used as a vegetable.

The Enterprise

The process documented is practiced by a five-member self-help group that produces bamboo fishing rods with technical assistance and training support from TRIBAC. The enterprise has a capacity to produce 135,000 fishing rods per year, considering 300 workdays of one 8-hour shift each.

Buyers take delivery of the sticks from the production site; hence, no transportation or marketing costs are involved.

The enterprise documented here uses *Bambusa affinis,* locally known as *Kanakaich* bamboo, which in Tripura grows to a height of about 15 ft and attains a diameter of about 2.5 cm. It has thickened nodes, and internodes are about 40-50 cm long. The bamboo is mainly used for making fishing rods and javelins.

Inputs

- Bamboo poles
- Hacksaw
- Knife
- Sand
- Mustard oil
- Caustic soda
- Clay hearth
- Wooden jig
- Gunny cloth
- Rope

Process Details

1. The bamboo pole used has a length of 15 ft and a diameter of 15 mm. It is cross-cut into three pieces of 5 ft length.
2. The outer nodes are cleaned with a knife.
3. The bamboo rods are left to dry in the sun for 15 days.
4. After drying, the outer surface of the rods is roughened by rubbing with sand taken on a piece of gunny cloth.
5. A mixture of mustard oil and caustic soda in the ratio 1 litre to 1 kg is prepared and applied to the bamboo rods to make the rods supple and improve their colour.
6. The rods are then heated gently with the help of a small fire in a clay hearth to straighten and preserve the rod. The hearth is semi-closed, with a 2-inch slit at the top into which the rods are introduced for heating. A wooden jig – a wood post with a deep notch cut into it – fixed to the ground is employed for straightening the rods.
7. Finished rods are wiped clean with a wet gunny cloth, allowed to cool and bundled using rope, 150 rods to a bundle, for transportation to markets.

Developed and produced by:

CIBART

Centre for Indian Bamboo Resource and Technology
1st floor, 200 Jor Bagh
New Delhi 110003, India
Tel: 91-11-2460 4404/34
Fax: 91-11-2464 8303
E-mail: info@cibart.org

INBAR

International Network for Bamboo and Rattan
No. 8, East Avenue, Fu Tong Dong Da Jie
Wang Jing, Chaoyang District, Beijing
100102
People's Republic of China
Tel: 86-10-64706161
Fax: 86-10-64702166
E-mail: info@inbar.int

The production of this catalogue has been supported by:

IFAD
INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT

BAMBOO FISHING ROD : ON-FARM MODEL

A. PARAMETERS

Local currency unit:	INR (US$1 = INR 46)
Interest rate	
- working capital (without project)	6% per year
- working capital (with project)	15% per year
- fixed capital (without project)	6% per year
- fixed capital (with project)	15% per year
Loan period (months)	
- working capital (without project)	12 months
- working capital (with project)	60 months
- fixed capital (without project)	12 months
- fixed capital (with project)	60 months

B. FIXED CAPITAL

	Without project				With project														
	Y1-Y5				Y1			Y2			Y3			Y4			Y5		
Item	Unit	Quantity	Rate	Total	Quantity	Rate	Total	Quantity	Rate	Total	Quantity	Rate	Total	Quantity	Rate	Total	Quantity	Rate	Total
Tools & Equipment (Saw, Knife, Hearth, Jig)	Lump sum	1 Set	0	0	1 Set	Lump sum	2,500			0	1 Set	Lump sum	2,500			0			0
Total							**2,500**						**2,500**						

Notes:
1. Average operating life of tools is 2½ years.

C. OPERATING COSTS

Item	Unit	Without project									With project								
		Y1-Y5			Y1			Y2			Y3			Y4			Y5		
		Quantity per unit	Rate (INR)	Total	Quantity	Rate	Total	Quantity	Rate	Total	Quantity	Rate	Total	Quantity	Rate	Total	Quantity	Rate	Total
Raw Materials																			
Bamboo (B. affinis)	per fishing rod		1.670	-	13500	1.670	225450	13500	1.670	225450	13500	1.670	225450	13500	1.670	225450	13500	1.670	225450
Sand	per fishing rod		0.027	-	13500	0.0270	3645	13500	0.0270	3645	13500	0.0270	3645	13500	0.0270	3645	13500	0.0270	3645
Mustard oil	per fishing rod		0.050	-	13500	0.050	6750	13500	0.050	6750	13500	0.050	6750	13500	0.050	6750	13500	0.050	6750
Caustic soda	per fishing rod		0.025	-	13500	0.025	3375	13500	0.025	3375	13500	0.025	3375	13500	0.025	3375	13500	0.025	3375
Rope	per fishing rod		0.007	-	13500	0.007	945	13500	0.007	945	13500	0.007	945	13500	0.007	945	13500	0.007	945
Labour																			
Per fishing rod	workday	0.005970	60.000	0.3580	805.95	60.00	483570	805.95	60.00	483570	805.95	60.00	483570	805.95	60.00	483570	805.95	60.00	483570
Marketing & other costs	per cent																		
Total							**288522**			**288522**			**288522**			**288522**			**288522**
D. REVENUE																			
Sales/year	No	1125 rods per month	0	0	13500	4.00	540000	13500	4.00	540000	13500	4.00	540000	13500	4.00	540000	13500	4.00	540000
Total							**540000**			**540000**			**540000**			**540000**			**540000**

E. CASH FLOW PROJECTIONS

Item	Y1	Y2	Y3	Y4	Y5
INFLOW					
Sale revenues	540000	540000	540000	540000	540000
Enterprise contribution					
- Fixed capital	2500	0	2500	0	0
- Working capital (2 month operating cost)	57704	0	0	0	0
Total inflow	600204	540000	542500	540000	540000
OUTFLOW					
Fixed capital	2500	0	2500	0	0
Operating costs	288522	288522	288522	288522	288522
Total outflow	291022	288522	291022	288522	288522
Cash Flow	309182	251478	253978	251478	251478

F. FINANCIAL ANALYSIS

Return on total capital employed					
- Income from sales	540000	540000	540000	540000	540000
- Cash outflow	291022	288522	291022	288522	288522
- Net cash flow	191274	251478	248978	251478	251478
Internal rate of return – IRR (%)	441				
Discounted cash inflow	2333572				
Discounted cash outflow	1219817				
Net present value – NPV	1113755				
Benefit/Cost ratio	1.91				
Contribution (Sales - variable cost)	251478	251478	251478	251478	251478
Profit before Interest, tax & depreciation	251478	251478	251478	251478	251478
Fixed Cost	Nil				
Depreciation	1000	1000	1000	1000	1000
Profit before Tax – PBT	251478	251478	251478	251478	251478
Present value ratio – PVR	47	47	47	47	47
Tax (tax exempted)	Nil				
Profit after tax – PAT	251478	251478	251478	251478	251478
Break even point (in value)	14758				
Break even point (in unit)	537				