

The Status of Bamboo and Bamboo Craft in Karjat, India, and Strategies for Development

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Kanwarjit Nagi

FOREWORD

Crafts have stood as a measure of human creativity through generations, particularly so in the developing countries. Traditional crafts have been an important part of subsistence economies that existed, and still do in some pockets in the remote rural areas, before the incursion of industrialized production and cash economy. Although the pressures of modern living have ravaged the sources of traditional craft materials, crafts have managed to survive. In recent years, governmental and non-governmental agencies in many countries have taken measures to ensure that crafts do not die out.

Bamboo has been and continues to be a material of choice for traditional crafts throughout Asia. Here, bamboo craft still makes a significant contribution to rural income and employment, although the rapidly diminishing supplies of forest bamboo and the lack of substantial value addition in traditional bamboo craft have joined forces to erode its status.

Karjat region in Maharashtra, India, has a rich tradition in bamboo craft, maintained mainly by tribal people. This study by Kanwarjit Nagi of the Academy of Development Science, Karjat, examines the status, potentials and problems of bamboo craft in the region, and suggests strategies for the development of bamboo craft. We hope that this study, published as part of INBAR's Working Paper Series on bamboo production-to-consumption systems in various countries, will contribute to development initiatives in bamboo and craft sectors.

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1 INTRODUCTION

This report is the result of a two-year study and documentation project carried out to understand the place of bamboo craft in the life of tribal communities in the Karjat region of the Western Ghats, Maharashtra, India. It consists of two parts:

1. A status report on bamboo, giving an up-to-date appraisal of the bamboo resource in Karjat region and its use by the local people.
2. A strategy document that tries to evolve a comprehensive set of guidelines to direct all future bamboo-related work in this region.

The study takes a people-centred- approach that essentially focuses on local communities and their abilities and strengths, keeping in view the contexts and interlinkages of craft.

Throughout this report the word “craft” is used to indicate an occupation that requires skill and manual dexterity, while the term “craftsperson” implies a skilled worker in craft.

The first phase of the project was devoted to collecting primary data in the following four categories:

- Actual stock of bamboo;
People’s knowledge;
The craft tradition; and
- Bamboo markets.

This information is presented in Chapter 2, under the title “The Status of Bamboo and Bamboo Craft”.

In the second phase, the insights gained from the survey were tested and refined to identify thrust areas and generate active plans for future work on bamboo in Karjat. This is discussed in detail in Chapter 3 on “Future Strategies”.

Methodology and Approach

The emphasis of the project was on developing a deep understanding of the bamboo sector; hence, material had to be gathered from a wide range of sources, as well as from different subjects and perspectives ranging from taxonomy and sociology to design and economics.

Data were collected through personal visits to nearly 100 villages and the surrounding forests. Spot and transect surveys helped assess the stock of bamboo. Personal interviews, observation and detailed interaction seemed the most appropriate techniques to gather information from the local people. The interaction laid the foundation for a sustained dialogue and long-term relationship; it was not conceived as a one-time encounter.

This wide-ranging yet intense mode naturally limited the geographical area covered by the study. Throughout, statistical data have not been used as the primary analysis tool, but as a means to clarify, the understanding that emerged out of observation and personal interviews.

While evolving the strategy, many secondary sources of information (journals, books, and reports) and experts (anthropologists, administrators, environmental activists, designers, architects and scientists) were consulted. In addition, ideas were tested and refined by setting up an experimental nursery, designing new products with local craftspersons and visiting certain ongoing projects on bamboo in Maharashtra State.

The tribals are not an odd people having peculiar customs worth photographing and recording; they are ordinary people with needs and aspirations like any of us, but have been pushed to the periphery of the society. Vestiges of many harmonious, equitable and experimental ways of interacting with their surroundings are still alive among these people. The personal interviews sought to gather as much information as possible from them and use this to build an appropriate strategy for bamboo.

The approach and format used may serve as a prototype for documenting and mapping any other resource and its use by communities elsewhere. This document is meant to serve as a starting point for anyone attempting bamboo-related activities in the region. It is expected to help generate active plans for the revival and strengthening of bamboo craft and related traditions in the area.

2 STATUS OF BAMBOO AND BAMBOO CRAFT

Background

The region studied (Fig. 1) has a gently rolling topography and forms the northern limit of Western Ghats (Fig. 2). Numerous seasonal streams and rivulets criss-cross the land and eventually join the Ulhas river, which meets the sea at Mumbra, 50 km away.

The climate is moderate, summers not very hot and winters not too cold, with a very heavy monsoon (3 800 mm of rainfall) spanning four months of the year. After the monsoon, there is a short period of 'second warming' when temperature and humidity are high (Table 1). This is a unique feature of the entire Western Ghats.

Table 1: Climatic data

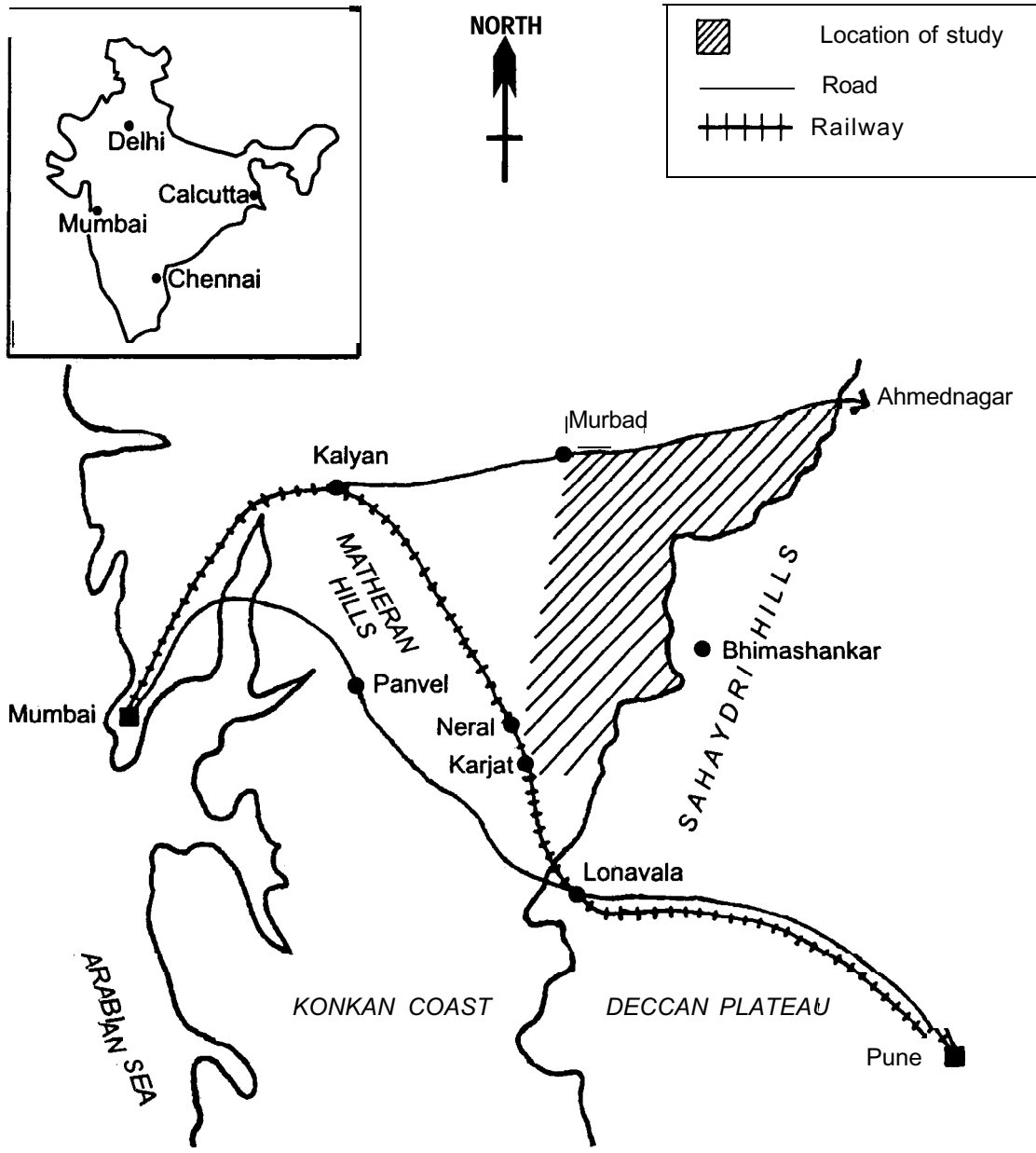
Season	Months	Temperature (°C)		Humidity %	Rainfall (mm)
		Max.	Min.		
Summer	Mar-May	40	18	60	Nil
Monsoon 800	Jun-Sep	28	23	89	3
Second warming	Oct	32	21	75	Nil
Winter	Nov-Feb	27	12	65	Nil

The soil type is classified as fractured-conglomerate basalt. It is highly porous and does not retain moisture. Owing to the severe water crisis, people some times have to walk 3-5 km to fetch potable water.

The combined effect of topography, soil and climate supports moist deciduous forests. Trees display a distinct leafless period from December to April. Moving up the Ghats, the vegetation changes to semi-evergreen.

The major deciduous tree species found in this region are:

Tectona grandis (Saag);
Butea frondosa (Palas);
Terminalia tomentosa (Ain);
Bridelia retusa (Asana);
Madhuca indica (Moh);
Lagerstroemia parviflora (Bondara);
Anogeissus latifolia (Dhawda);
Bombax malabaricum (Savar);
Semicarpus anacardium (Biba); and
Hollarena antidysentrica (Kuda).



Location	: Karjat Tribal Block, Raigad District, Maharashtra; 70 km east of Mumbai
Area covered	: 1 400 km ²
Latitude	: 18° 55' N to 19° 15' N
Longitude	: 73° 20' E to 73° 35' E
Average elevation	: 115 m above sea level

Fig. 1: Location of study

In the forests, bamboo is found mixed with some deciduous tree species. There are no Pure bamboo brakes. The four species of bamboo found in the area are:

- Dendrocalamus strictus* (Manya)
- Pseudoxytenanthera stocksii* (Mes)
- Bambusa bambos* (Kalak)
- Pseudoxytenanthera monostigma* (Udha)

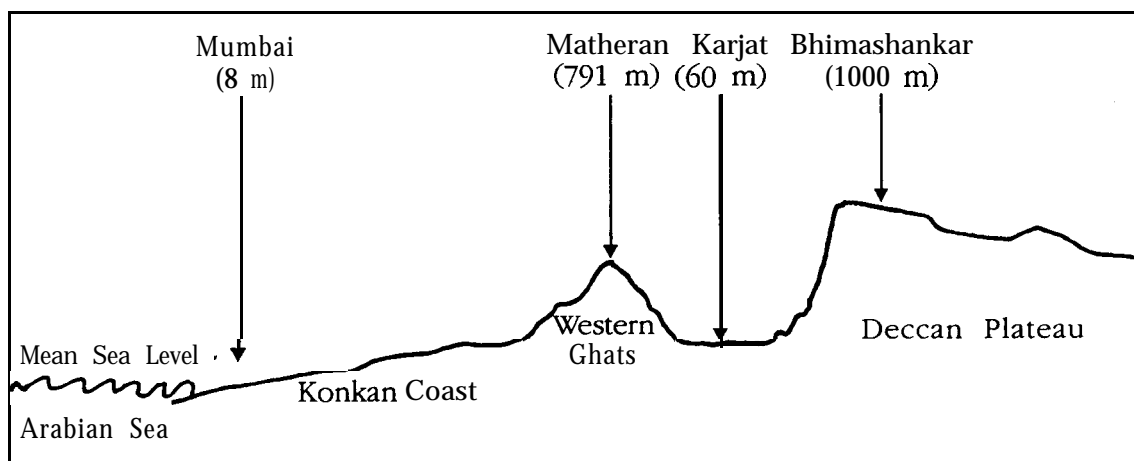


Fig. 2: Schematic section of the topography of the study region

Barboo Stock

Dendrocalamus strictus (Manya) is a deciduous, unarmed, densely tufted bamboo with strong culms that are solid or with only a small cavity. Culm size varies with climate, the height being 25-50 feet, the diameter 1-3 inches and the internodes 6-10 inches long. The culms are a glaucous green when young, and dull green or yellowish when old. The species is extensively found in the forests mixed with local deciduous tree species, and is widely cultivated in backyards and village common areas (Table 2).

Some stands of bamboo appear to be Manya (*Dendrocalamus strictus*) but are called Mankat by the locals. Mankat has hard fibres that make splitting difficult and hence, it is unsuitable for craft. Mankat resembles Manya closely in diameter, height, leaf size, culm sheath, etc. except that its nodes are more prominent and the internodes shorter. There is a need to examine whether this variation is of genetic origin or the result of soil, microclimate or other such site-specific differences.

Mes (*Pseudoxytenanthera stocksii*) has slender grey-green culms that are solid (sometimes with a small cavity). It is unarmed and has a few branches marked by pubescence rings. Culms have a height of 20-30 feet, a diameter of 1-3 inches and internodes that are 6-8 inches long. It is cultivated and does not occur in the forests (Table 2).

Table 2: Total stock of bamboo in the study area

Type	Total area (ha)	Total no. of culms ¹	Total stock (t) ²	Harvestable stock (t) ³
<i>Dendrocalamus</i>				
<i>strictus</i> (Manya)				
Natural	5 900	6 980 000	19 943	7 977
Cultivated	7.8	3 120 000	8 914	3 566
<i>Pseudoxytenanthera</i>				
<i>stocksii</i> (Mes)				
Natural	-	-	-	-
Cultivated	1.5	60 000	171	68
<i>Bambusa bambos</i>				
(Kalak)				
Natural	17 000	27 200 000	136 000	54 400
Cultivated	0.04	6 400	33	13
<i>Pseudoxytenanthera</i>				
<i>monostigma</i> (Udha)				
Natural	-	-	-	-
Cultivated	0.05	30 000	33	13

Notes:

1 = Total coverage density.

2 = Total number of culms the number of culms per ton.

3 = 40% of total stock.

Flowering was observed in Gawanwadi nearly 6 years ago. The flowering appeared normal but seeds did not set. As a result, nearly 100 m² of Mes bamboo were lost in that year. Similar incidents of sporadic flowering with no seed-set have been reported in Kikwi, Nagewadi, Olman and Chaahuchiwadi in the last 3 years. Some reasons forwarded for the absence of seed-setting are:

1. As flowering is sporadic, sometimes only one stand flowers at a time and there is very little opportunity for cross-pollination (a botanist);
2. Bamboo has separate male and female flowers. In the stands which flowered, only one type was present (a local farmer); and
3. As this is a species introduced into the region, the vector needed to assist in cross-pollination is absent (a forester).

Kalak (*Bambusa bambos*) is a tall, graceful, thorny bamboo with curving branches. Culms are bright green and shining. It reaches a height of 80-100 feet and a diameter of 6-8 inches, with fairly angular internodes of up to 18 inches long. The culm has a small or medium-sized cavity with 1-2 inch thick walls. The species is most abundant in the forests, and is found mixed with deciduous tree species (Table 2). It is sometimes cultivated. Flowering of Kalak was recorded 10 years ago in the forested tracts around Jamrukh village.

Till nearly a decade ago, there were large tracts of Udha (*Pseudoxytenanthera monostigma*) in the forests of the Ghats; today, there is almost nothing left. Over-exploitation has nearly made the species extinct in the region, where it is a native and potentially useful for craft. Very small quantities are cultivated in Khandus, Tungi and Bhaktawadi. When Udha flowered 4 years ago at Tungi village, people collected and replanted the seed to regenerate the stand.

A comparison of the distribution of bamboos in Karjat region is given in Fig. 3.

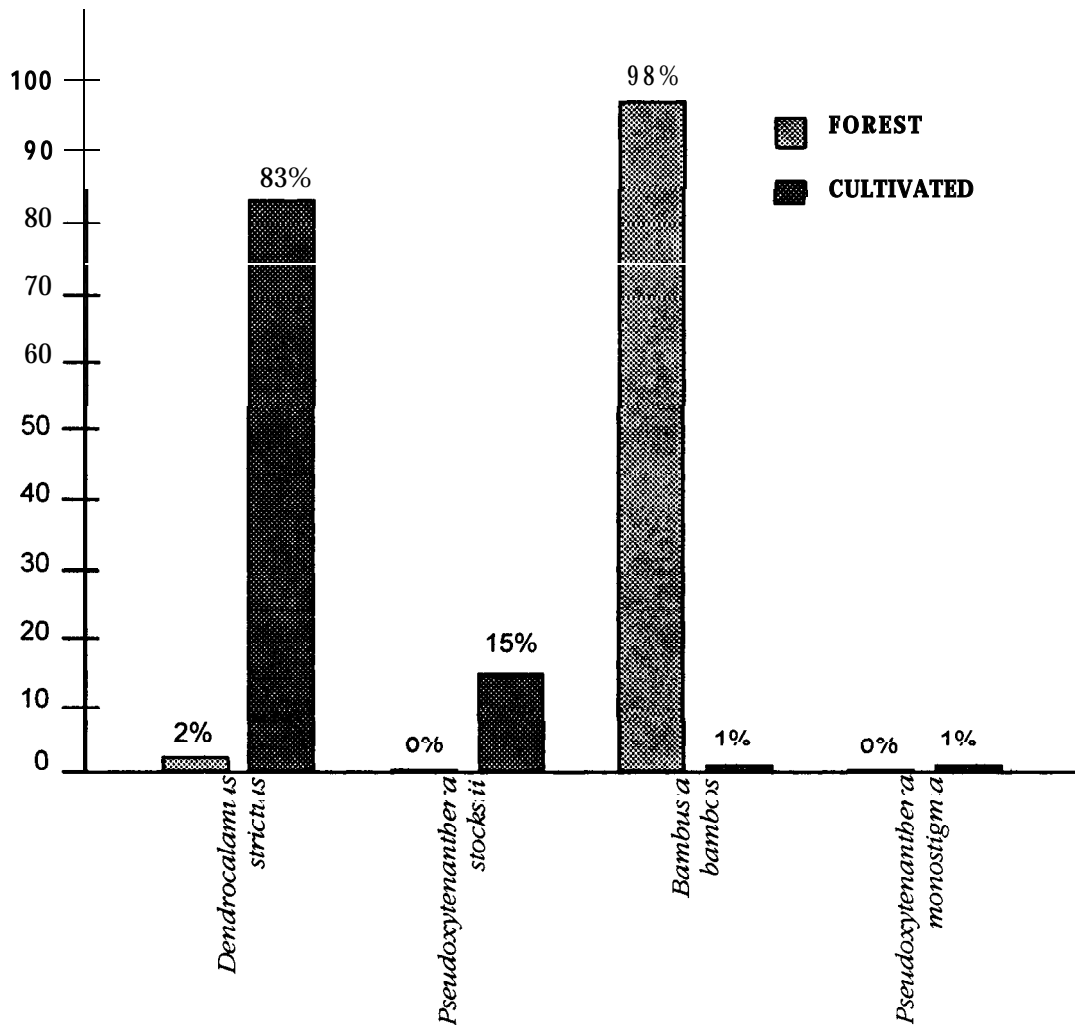


Fig. 3: Comparative distribution of bamboo species in Karjat region

Indigenous Knowledge on Bamboo Cultivation

Growing bamboo

In Karjat region, bamboo is propagated by planting rhizomes obtained from friends or neighbours who own healthy stands. The pit is prepared with loosened soil and decomposed rice straw.

The rhizome is planted between pre-monsoon showers and the main monsoon, in the first ten days of June. "Plant bamboo after the rains have begun but before the rivers begin to flow," goes a local saying. This ensures that the soil has become moist enough for the rhizome to establish itself before the heavy monsoon downpour. Rhizomes planted at this time get the full benefit of the monsoon and need not be watered in the dry season.

Maintaining the grove

Each year, the bamboo stand is given a filling of earth around the roots just before the monsoon. Good soil mixed with rice straw is firmly packed around the stand. This replenishes eroded soil, and stiffens and supports the culms above. The filling protects shoots that are about to break through the soil and prevents any mechanical damage to the rhizomes from strong monsoon winds.

Old rice straw from cow-sheds or roofs (where it is used as thatch) is used as fertilizer. This is believed to make the culm stronger and its fibres flexible. Cow-dung is never used as a fertilizer nor is it stored near the bamboo grove as it is believed to make the culm fibres soft and spongy, thus rendering the culms useless for craft. Such culms also attract pests very easily.

Bamboo Rice

Older people remember a gregarious flowering of Kalak that occurred in the nearby forests about 30 years ago. Seed fell in such large quantities that it formed a carpet on the forest floor; people recall going with brooms and gunny bags to collect it. Many stored the seeds for long periods and used them as a buffer in times of food scarcity. Bamboo seed is dehusked and eaten as a cereal in porridge or gruel form, or milled into flour and eaten as bhakri.

Harvesting culms

Usually new shoots appear only during the monsoon (June-September). In about 30-45 days, the new shoots gain their full height and begin to grow branches. Only culms that are older than 1 year are harvested for use. Cutting of younger culms and harvest during the monsoon are not practised as these might retard the expansion of the rhizome network and reduce future yields.

However, the culms are not allowed to remain in the stand for over 3 years as it will hinder new rhizome development. In December-January, lower branches up

to 5 feet from the ground are cut. This keeps the stand 'clean and makes access easy (older culms can be harvested without damaging others in the stand). While harvesting, the culm is cut 4-6 inches above the ground using an ordinary machete. The branches and tops are left behind in the grove and the craftsperson/buyer takes only the culm.

Old practices

Earlier, there was a practice of harvesting bamboo, and even hardwood timbers, on the new moon day or during the dark phase of the moon. People's experience suggests that pest and fungal attacks are significantly lower' on timber cut during this time. However, now the practice is being gradually abandoned as there is a steady demand for products throughout the year and the craftsperson finds it too cumbersome to keep track of the phase of the moon while dealing with impatient customers.

Till a decade ago, there was a practice of smoking the harvested culms, particularly those meant for use in house construction, over a fire of dry leaves, twigs and cow-dung. This was believed to enhance its durability and resistance to pests and fungus. However, this is hardly done today.

Normally, bamboo is never used as fuelwood in tribal homes as there is a belief that bamboo burnt in the hearth will attract hosts of ticks into the house. On the other hand, bamboo ash has marked pest repelling qualities and is often applied to vegetable crops.

The Sacred Grove

According to local customs, certain portions of the forest were demarcated as sacred spots, the abodes of a tribal deity. Often located near a temple or a water source, these *deotbans* were carefully protected and monitored by the tribal communities that lived nearby. Access to these spots was restricted except on special days when certain rites and sacrifices were performed to venerate the deity. No extraction was permitted at these groves, not even gathering of fallen leaves. A hunted animal that took refuge in the grove was spared by the hunters. Because of such severe restraints, the sacred groves were very densely forested and supported a rich diversity of flora and fauna. Some of the last surviving specimens of certain plant and animal species are to be found in the spots that were once *deotkans*. The sacred grove is an excellent example of an autonomous village institution that preserves and manages well its resource base.

The network of sacred groves that existed earlier has been rapidly wiped out by modern commercial forces that have destabilized the traditional management system. An unverified report claims the existence of an exclusive *deotban* in the upland forests, near Uglechiwadi, consisting entirely of *Bambusa bambos* (Kalak).

The People and the Craft

The region studied, the Karjat Tribal Block, is administratively classified as the most backward taluk of Raigad district and has a predominance of tribal communities. The Thakurs, who form the majority in the area, inhabit the upland areas of the foothills. They have small land holdings and are skilled bamboo workers. The Mahadeo Kolis occupy the mountainous parts of the Ghats, are skilled and settled agriculturists, and are the most well off among the three tribes. The Katkaris, who inhabit river valleys, do not own any arable land. They were primarily forest dwellers, skilled in hunting, fishing and gathering. Now they work as wage labourers, often in bonded labour, at brick-kilns and construction sites. The Katkaris are the poorest and the most marginalized of the three tribes.

Non-tribal communities in the area include: (1) Marathas and Agris, who are large landholders and rich farmers; (2) immigrants such as Gujaratis and Marwaris, who are traders and pawn brokers; (3) migrants from Ta.mil Nadu, Andhra Pradesh and Karnataka who mainly work as agricultural labourers; and (4) some Muslim land-owners and traders.

Bamboo craft: the context

Bamboo work is practised around the house, in the courtyards or verandahs. Products serve the daily needs of the people. The artisan and the user both live close by, not farther than a few villages apart.

During lean periods in agriculture and whenever time permits, men make bamboo articles for their households or for neighbours. Surplus products are bartered or sold in the market. Tribal women who always have their hands full – fetching water and firewood, cooking, washing, collecting and selling forest produce – find little time to indulge in craft. Only the elderly of them have the time to make bamboo items on a regular basis. As a result, most craftspersons today are male, in the age group 40-70 years. The most skilled of them are usually the oldest. It is common to find craftsmen who are lame or polio-afflicted. Having found no suitable vocation in their younger days, they took to bamboo work and are very skilled today. As the youngsters are not taking to bamboo craft, the present generation of craftsmen might be the last of their kind.

Bamboo craftspersons

Nearly all craftspersons are from the Thakur community (Fig. 4). The Marathas and the Mahadeo Kolis also make bamboo articles but for their own households or for relatives. The Katkaris do not know any bamboo work and depend on the Thakurs for their needs.

Every Thakur family has at least one member who is familiar with bamboo work. Knowledge of the craft is common, learnt by observation, trial and error, and is accessible to all. Unlike other artisan communities, there are no specialized groups or guilds that exclusively practise bamboo craft. As a result, there is a wide variation in skills.

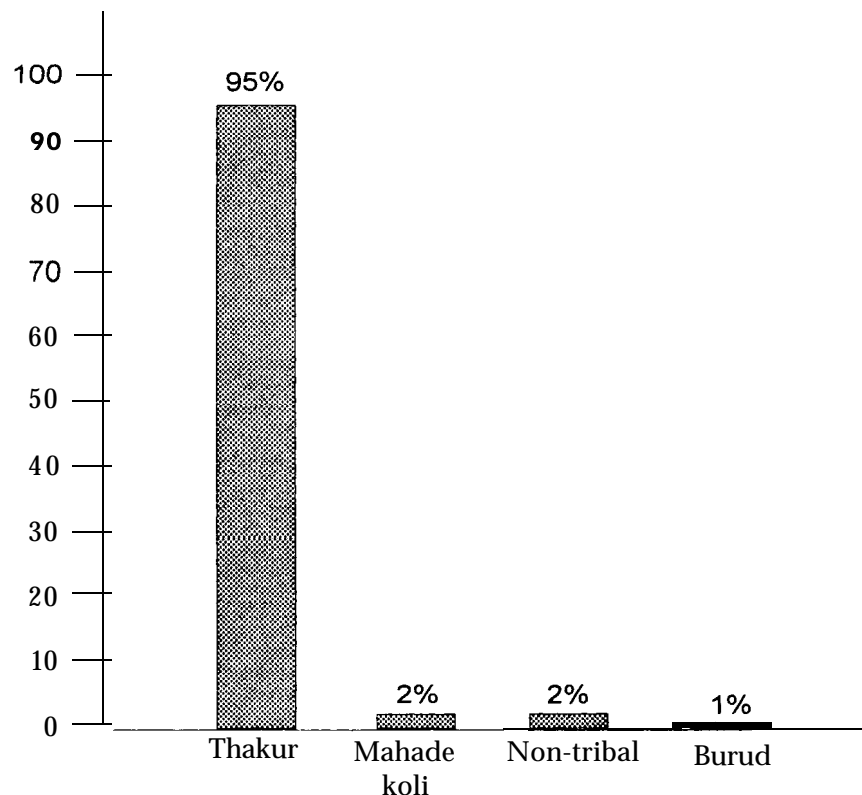


Fig4 Community-wise profile of bamboo craftspersons

Scattered over the region are six or seven Burud families, highly skilled traditional bamboo workers who are migrants from eastern Maharashtra. Owning no agricultural land, bamboo work is their sole source of livelihood. The entire family, including women, actively participates in the craft. The Buruds specialize in making winnowing fans (*soops*) which the Thakurs do not make. Being just a few families related by blood, they are a minority in the region.

Livelihood activities

The main economic activity in the region is agriculture (Fig. 5). Agriculture consists of only one rainfed crop: mainly rice in the lowlands and millets-such as Nagli (*Eleusine coracana*) and Varai (*Panicum miliaceum*)-on the slopes. Small quantities of pulses, oil seeds and vegetables are also grown for domestic consumption. Other sources of livelihood are gathering non-timber forest products (NTFPs), bamboo craft, wage-labour, rearing cattle and poultry, hunting, and fishing.

In different seasons, NTFPs are collected for home consumption as well as for the market: firewood, edible gum, medicinal herbs, roots and seeds, fruits (such as gooseberry, mango, blackberry, jack-fruit, etc.), tendu leaves, Moh flowers and seeds, wild vegetables, tubers, and leaves. This activity helps to build up a buffer

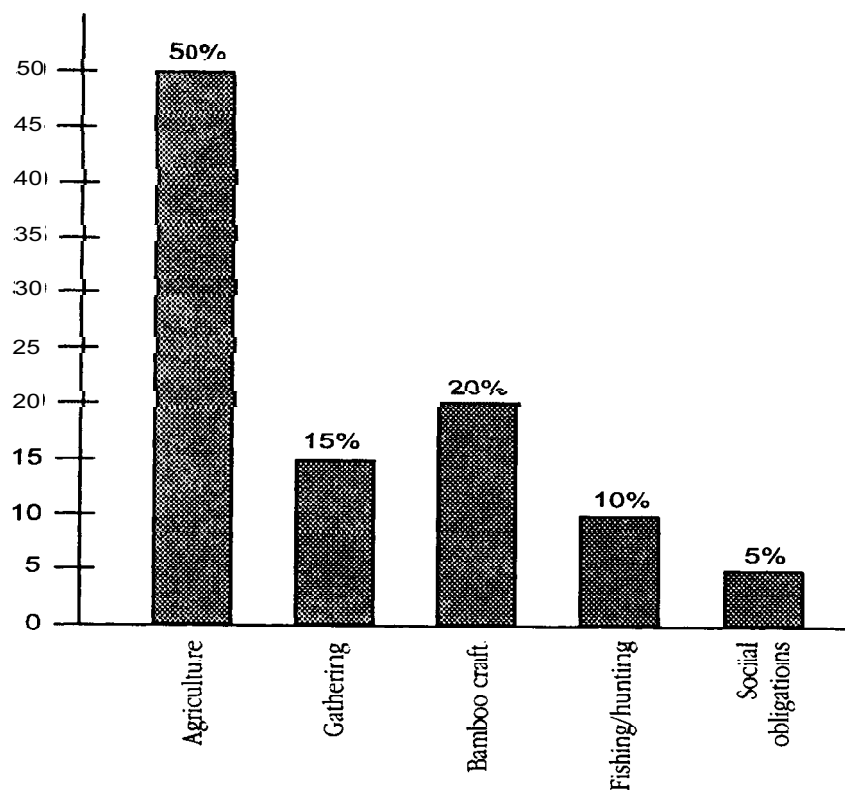


Fig. 5: Time spent on different activities by a typical Thakur family

income for the monsoon months. The family's annual requirement of pulses and oilseeds is also met from income generated by gathering NTFPs and bamboo work.

Table 3: Calendar of seasonal activities

Month	Agriculture	Gathering	Bamboo craft/ wage-labour	Fishing and hunting	Rearing cattle and poultry
April		*	*	*	*
May		*	*		*
June	*				
July	*				*
August	*				*
September	*			*	*
October	*			*	*
November				*	*
December		*	*	*	*
January		*	*	*	*
February	*	*	*	*	*
March	*	*	*	*	*

Bamboo craft is not a full-time activity: it is seasonal or sporadic (whenever the need arises). The craftspersons, like other tribals, own a small piece of land, grow food, keep a few cattle and some hens, and work for wages occasionally; bamboo work is just one of his many skills. This allows the craftsperson to participate in a diverse range of activities that are sensitive to human cycles (celebrations, festivals, etc.) and remain in tune with seasonal cycles. Such a diverse range of subsistence activities provides him with considerable security (Fig. 6). The varied pace of work eliminates boredom and obviates the need for compulsive leisure or pastimes.

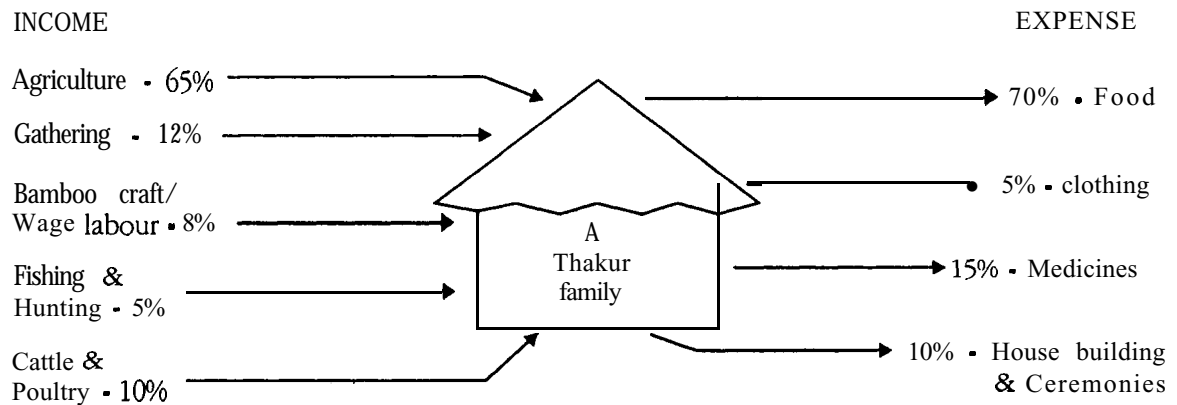


Fig. 6: Income sources and expense heads of a typical Thakur family

A changing lifestyle

The tribals no longer have free access to the forests, rivers and their surroundings. This has severely curtailed their former hunting-gathering lifestyle. They are now increasingly forced into money economy, wherein nearly everything has to be paid for in cash. Consequently, there is an evident attraction towards occupations that fetch higher cash incomes.

In addition, the present education system and changing aspirations have resulted in an aversion to manual work. Today, very few youngsters take to agriculture, bamboo work or gathering of forest produce. On the other hand, since most tribal children drop out at middle-school level, they are unable to secure good careers in the mainstream. They work in hotels or as daily-wage labour in the nearby industries and are thoroughly exploited. Thus, they are alienated both from their natal community and from the society they chose to emulate.

Bamboo as Raw Material

Ownership

Nearly all cultivated bamboo is owned by non-tribals (Fig. 7). Tribal cultivators are mainly the Thakurs and Mahadeo Kolis. Neither the Katkaris nor Buruds own any bamboo.

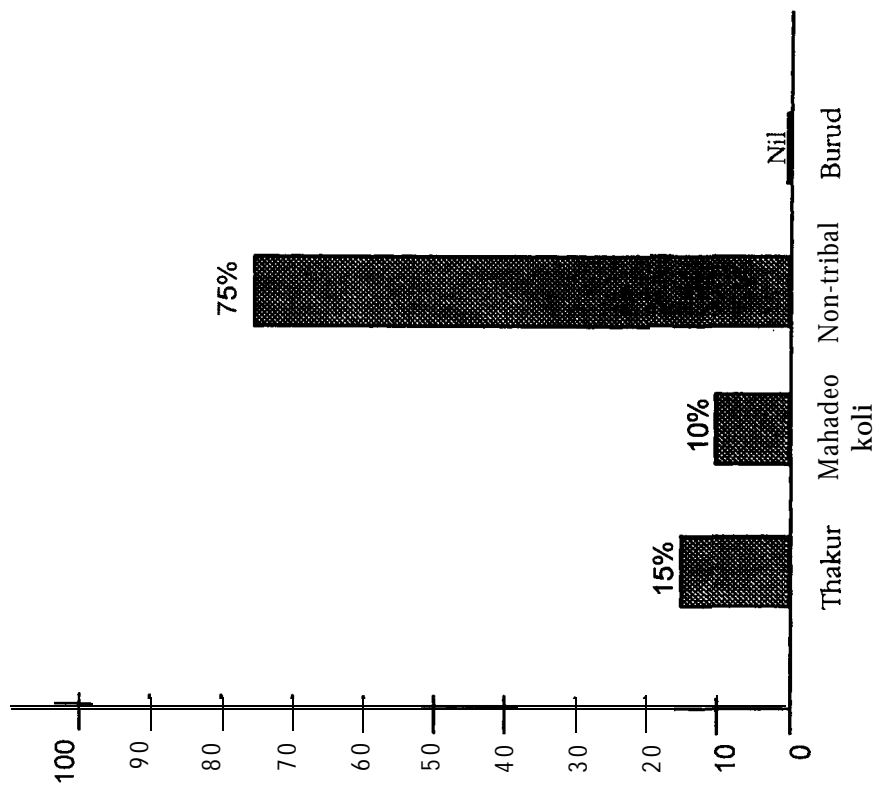


Fig. 7: Community-wise ownership. of cultivated bamboo

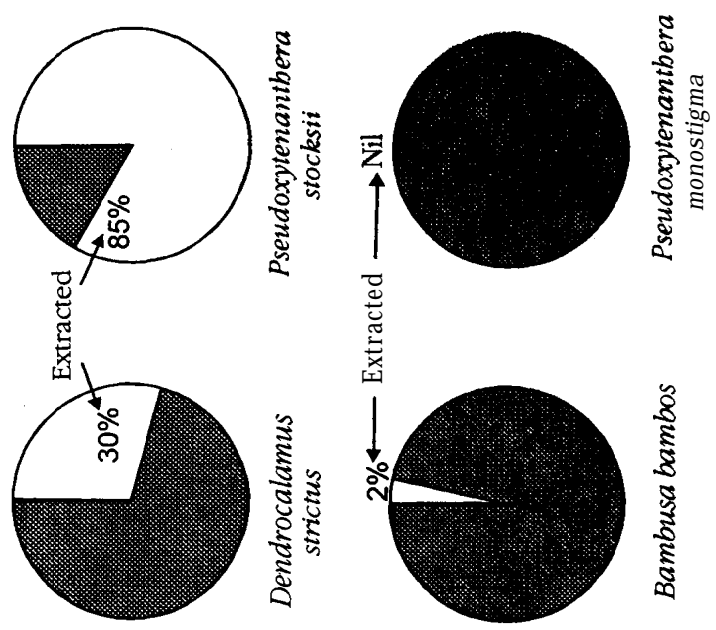


Fig. 8: Percentage of bamboo extracted from harvestable stock (both forest and cultivated bamboo)

Since forests today are managed and controlled by the Forest Department, extracting forest bamboo is illegal. Nevertheless, small headloads are extracted surreptitiously by the tribals for their own use (Fig. 8). Trying legally to obtain a licence or permit to harvest forest bamboo is nearly impossible for them. Not only is the procedure long-winded, but also the effort often futile as forest rangers and guards still expect their customary bribes.

Access

There are three ways in which a craftsperson obtain cultivated bamboo. When the volume of bamboo involved is small (for instance, five culms), it may be brought at one time by the craftsperson as a headload, paying for it in cash. The culms are selected by the buyer, but cut and extracted by the owner of the stand. Often, the entire stand is taken on an annual lease by a particular craftsperson, with the payment made in instalments. Small quantities are extracted by the craftsperson himself as and when required. The bamboo may be transported as a headload or by bullock cart, depending on the quantity extracted. This mode of extraction favours the craftsperson (at almost half the market price); however, stand owners are reluctant to enter into lease arrangements as, sometimes, an unscrupulous buyer may extract young culms (less than one year old) and thus reduce future yields. The third way is followed when the quantity of culms required is large. There are some tribal villages, about 10 in the region, clustered around the main highways, where people practise bamboo craft in a big way. They require large quantities of bamboo regularly (a village of 125 families consumes three truckloads every week, each truckload carrying approximately 800 culms). Having exhausted resources in their vicinity, they are forced to transport raw material from long distances, and may purchase 2-3 truckloads at a time (Table 4).

Table 4: A comparison of different bamboo sale arrangements

Item	Small-scale	Lease agreement	Large-scale
<i>Pseudoxytenanthera stocksii</i> (cost/culm)	Rs. 12.00	Rs. 6.00	Rs. 10.00
<i>Dendrocalamus strictus</i> (cost/culm)	Rs. 9.00	Rs. 4.50	Rs. 3.50
Mode of transport	Head-load max=4 culms	Bullock cart max=25 culms	Truck max=25 culms
Avg. distance travelled	Up to 5 km	Up to 10 km	20-60 km
Avg. transport cost (per km)	nil	Rs. 3.50	Rs. 16.00

Utilization

Craftspersons prefer cultivated bamboo to forest bamboo. Fibres of cultivated bamboo are even and easy to split. As forest bamboo is untended, the culms are

often crooked, the fibres uneven, and the very hard nodes make long splits impossible. A comparison of the characteristics of bamboo used is given in Table 5.

During the eight dry months of the year (November/May), bamboo is harvested as and when required. There is no tradition of storing. Craftspersons decidedly prefer to use green bamboo for their work, often discarding dry pieces altogether.

Table 5: Relative characteristics of different bamboos used

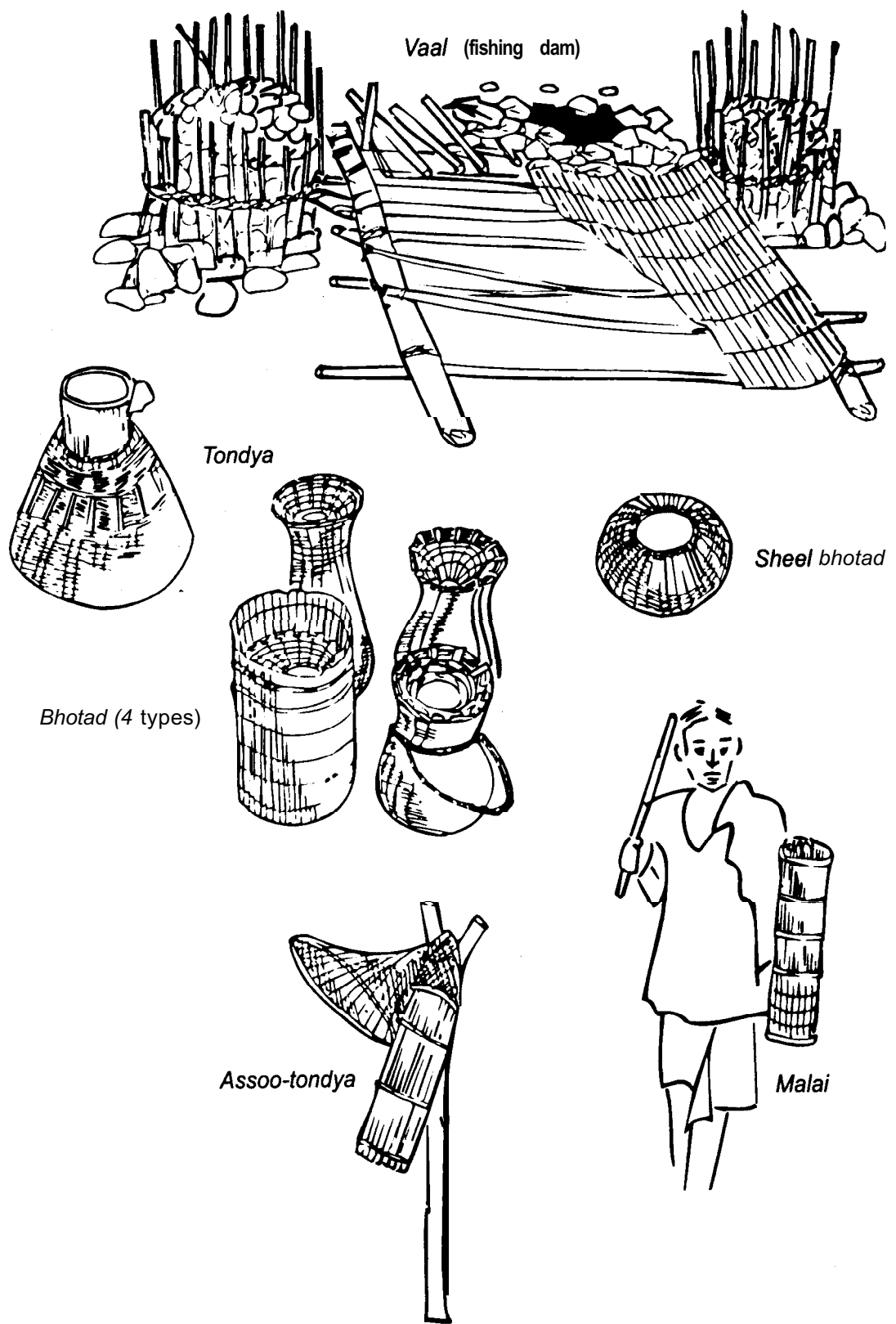
Species	Fibres	Culm cavity	Nodes	Distance of source (km)	Uses
<i>D. strictus</i>	Average	Small	Inconspicuous	up to 5	Baskets, bins, implements, tools, weapons and toys
<i>P. stocksii</i>	soft	Absent	Inconspicuous	5-10	Winnowing fans, fish traps, baskets and flag posts
<i>B. bambos</i>	Hard	Large	Prominent	Beyond 10	Bullock carts, shelters, cradles, ladders and weapons
<i>P. monostigma</i>	soft	Absent	Inconspicuous	N. A.	Baskets

For craft, (a) soft fibres allow fine splits to be made, (b) absence of culm cavity provides more number of splits per culm, (c) inconspicuous nodes allow longer splits without cracking or breaking, and (d) availability nearby reduces transportation costs. These may be the reasons why *P. stocksii* is the most extracted and preferred bamboo for craft work.

Bamboo Products of the Region

Fish traps

Among the many bamboo products made in the region, the most common and ingeniously fashioned are fish traps (Fig. 9). The bamboos used for the purpose are usually *P. stocksii* and *D. strictus*. Fish is an important part of tribal diet. The fishing season begins from August (mid-monsoon) and lasts till November (when the rivers stop flowing). Throughout the active fishing season the fish captured are salted, smoked, dried and stored for consumption during the rest of the year. Today, the practice of fishing and storing has reduced considerably and much sea-fish, fresh as well as dried, reaches the nearby markets.



Vaal (fishing dam)

Tondya

Sheel bhotad

Bhotad (4 types)

Assoo-tondya

Malai

Fig. 9: Different fish traps made of bamboo

Being primarily forest dwellers, tribals have a keen sense of observation and understand minutely the behaviour of plants and animals, particularly that of fish. There are different traps to catch fish up-river and down-river, in paddy fields, and in fast and slow-flowing streams. There are also traps exclusively meant to catch crabs and prawns.

First a fishing dam (uaal) is constructed in a suitable location in the stream. These locations have been selected over generations for their abundant yield. Fishing rights in a particular spot are inherited from generation to generation within the extended family.

The dam consists of gabion-like pillars made of branches and vines and filled with rocks; these are spanned by larger logs. The rivulet/stream is channelled through a spillway which raises the water using a framework of branches, teak leaves and sand. Different types of traps are placed at specific locations in the spillway, depending on the type of fish to be caught:

- *Bhotad* and *tondya* are used to catch large fish coming downstream;
- *Malai* and a differently constructed *tondya* are used to catch smaller fish;
- *Sheel bbotad* catches fish climbing up river;
- Assoo is added to the *tondya* in fast-flowing rivers or when the flow is turbulent;
- *Gadga*, an ingeniously fashioned crab trap, is placed in shallow waters or on the banks of the river. It has a separate chamber for placing bait, usually a frog, which lures many crabs into the trap; and
- A smaller *tondya* is used to catch prawns that breed in the waters of rice fields. The *tondya* is placed at the point of overflow of the field.

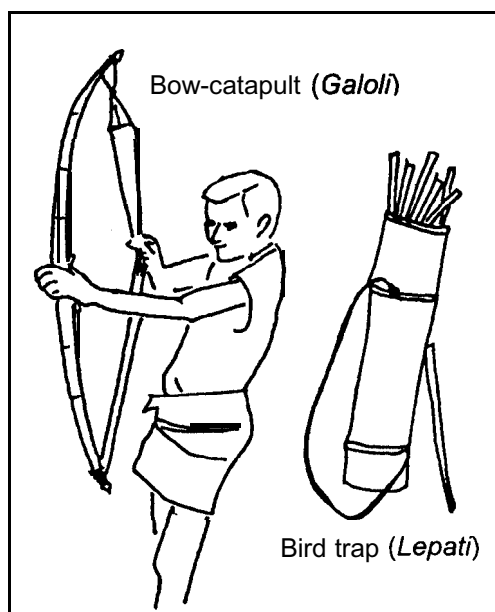


Fig. 10: Hunting implements

Hunting is an enjoyable social activity, often involving an entire village, as wild boar, hare and birds also form a part of the tribal diet. Bow and arrow (*dbanush-baan*), spear (*bhala*), stick (*kathi*), bow-catapult (*galoli*), net (*waghur*) and snare (*phas*) are some of the weapons used for hunting. *Lepati* is used to trap birds (Fig. 10). It consists of pointed bamboo sticks dipped in the sticky sap of *Moh* (*Madhuca indica*) and placed strategically on the branches of the trees. *B. bambos* (Kalak), with its hard fibre, is preferred to make these weapons and implements.

Baskets and containers

P. stocksii and *D. strictus* are used extensively to make the following containers for household use (Fig. 11):

- *Topli*, an open basket, ranges in diameter from 5 inches to 2.5 feet and are used to store and transport a variety of items;
- *chaap* a large open-weave basket, is used to collect and transport leaves. Overturned, it also doubles as a chicken coop;
- *Kirkinda*, a small loosely woven cylindrical basket with lid, is used to keep onions, potatoes, garlic, etc.;
- *Kangi*, a storage bin, is used to stock milled rice; and
- *Kanga* is a large bin used to store rice paddy. It is an upright cylinder of bamboo mat without lid or bottom. Mud and cow-dung plaster is used to seal both ends. The size of a *kanga* is measured in *haath* (cubits) and is usually 3 cubits by 10 cubits. A household may have 1-3 *kangas*, each holding up to 2.5 tons of rice paddy.

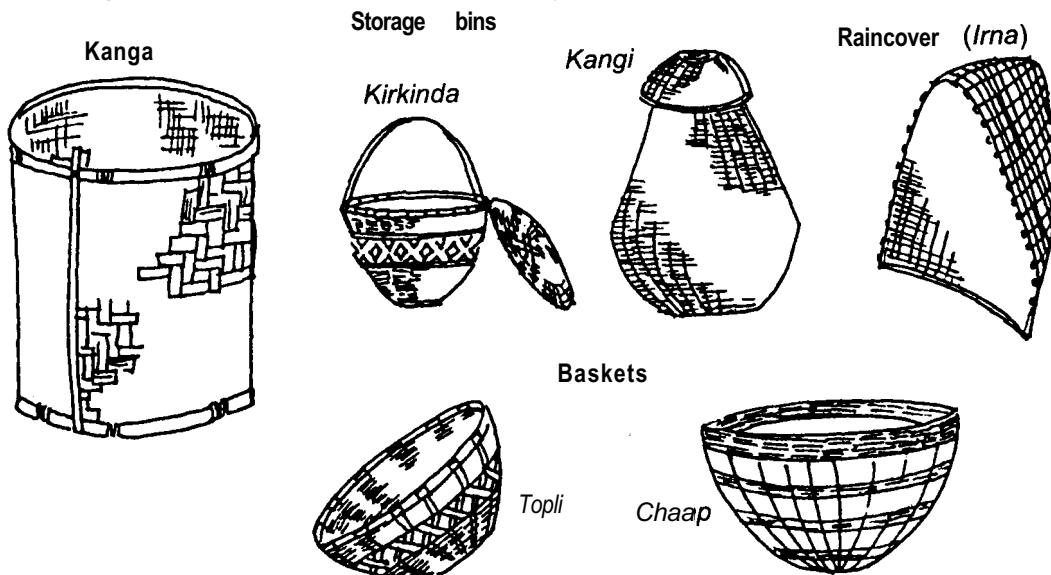


Fig. 11: Some bamboo containers produced in the region

Baskets V/s. Bags

Till about a decade ago, it was common for craftsmen to carry a bundle of 30-odd baskets up the Ghats and barter them for pulses, oilseeds, spices, onion and potatoes. Each craftsman had a fixed beat and supplied a few villages only, with his visits timed to coincide with the harvest in the uplands. Today, the demand for bamboo baskets has diminished somewhat owing to the popularity of plastic and Nylon shopping bags, metal storage containers, etc. The craftsmen too find it tedious to spend an entire day climbing the Ghats with a load of baskets. These days they prefer wage labour nearer home as it fetches cash income.

Other products

It is interesting to note that the Thakurs are reluctant to make winnowing fans (soops). As a result, the Buruds have a monopoly over this product.

B. bambos is preferred whenever bamboo is needed for structural purposes. The only exception seems to be the temple flag-post (*diwal kathi*) for which a long, well-formed culm of *P. stocksii* is used.

The bottom and sides of bullock-cart carriages are made of bamboo strips. Bamboo is also used to make handles of various tools and implements. *Jbari* (a rake) is often made entirely of bamboo. Bamboo splits are twisted into thin ropes to tie harvested sheaves of rice paddy.

Irna is a double-weave bamboo frame used as a rain-cover (Fig. 11). Palas leaves (in olden days) or a plastic sheet is inserted between the two weaves to make the inside waterproof.

Cattle shed (*gotha*), temporary shelters (*mamdav*) for summer days, ceremonies, banquets and festivals, and the traditional decoration above idol of the family deity (*makhar*) are usually made of bamboo.

When Karvi reed (*Strobilenthes ciliatus*) is not available to construct the walls of the house, bamboo splits may be used. Bamboo batons are often placed on wooden rafters when making the roof.

Ladder (*slbidi*), cradle (*palna*) and bird-cage (*pinjra*) are some of the other household articles made of bamboo.

In the past, whole-culm bamboo containers were used to store lentils, salt, dry fish, etc. Ladles (*dow, dowli*) and lids (*cheba*) were made from leftover bits of bamboo. Today, these items have been completely replaced by plastic and metal products.

Occasionally, one comes across flutes and toys made of bamboo. Cowherds are often skilled musicians and make their own flutes. Two types of flutes can be seen today: the shorter, hand-held, j-holed flute; and the longer (up to 5.5 feet), 4-holed flute that is long enough to be rested on the ground while playing.

Bamboo toys made today include small bow & arrow (*dbanush-baan*), catapult (*galoli*), water pistol (*pichkari*), and a bamboo tube-and-piston device (*chitakru*) in which a small fruit is inserted and used like a gun.

Preservation and Finishing Techniques

Bamboo baskets and storage containers are treated with a thin coat of cow-dung plaster before use. This not only reinforces the container, but also provides protection against borers and fungus. The coat is reapplied every year, usually after the long monsoon. Bamboo splits and woven articles are occasionally dyed with yellow earth or turmeric to give them a yellow tint. An extract of Palas (*Butea*

frondosa) flower is used to impart an orange colour to baskets. The Palas plant flowers during January-March, which coincides with the annual temple fairs at Mhase and Bhimashankar. Coloured baskets sold at these fairs fetch a higher price. A heated iron rod is sometimes used to burn patterns on the strips that make up baskets, bins and containers, but this is not very common today.

Tools

Since bamboo craft is not a specialized activity, no specific or unique tools have evolved. Tribals use the ubiquitous machete (*koyta*) for harvesting, preparing culms and making splits. Sometimes, a small blunt chisel is used to turn-in and finish the rims of baskets. No other tools are used. The machete is fabricated and repaired by local blacksmiths and costs Rs. 30-50.

Occupational Hazard?

Most craft workers believe that working with bamboo causes a condition diagnosed by traditional healers as *dhanur vaath*. Because of the need to sit in a crouched position for long hours, working intensely, the back becomes rigid and taut like a bow, and the hands and feet cramped. A remedy popular among older craftspersons is to consume locally brewed liquor every evening. The younger artisans prefer to visit a doctor and get an injection of a pain killer.

Markets for Bamboo

A cursory glance at bamboo trade shows that there is a perennial demand for bamboo articles. Despite seasonal variations, trade is always brisk. Bamboo articles are inexpensive as, unlike metals and plastics, they have no hidden costs and subsidies. As a result, profit margins are also quite low.

Bamboo products are always sold from pavements and temporary shelters. Craftspersons and sellers do not have permanent shops in market places; however, they do have fixed locations to which they return every time on market days. Buyers prefer to patronize one particular craftsperson instead of buying from different people each time. Craftspersons too go out of their way to custom-make articles for their patrons.

Profile of bamboo markets

Bamboo products are traded through a wide variety of systems, ranging from barter within a neighbourhood to high-volume cash transactions between craftspersons and traders. Markets for bamboo articles can be broadly classified into four types:

- Informal village sales
- Town markets
- Annual fairs
- Transit markets

Informal village sales

Every village has at least one skilled craftsman. He satisfies most of the needs of his village. Since skill levels vary considerably, villagers might travel up to 10 km to specifically order certain items. The variety of products sold in the villages range from fish traps, baskets, bins to other household articles.

Articles are usually made to order and are paid for in cash or kind. A large basket may be exchanged for 4 kg of rice paddy or a rooster. In case the buyer grows his own bamboo, the craftsman is invited over to make the article. His daily wage includes two meals, Rs. 25 and a quarter bottle of country liquor. Often, the craftsman himself does not own bamboo and has to purchase it from the nearest source.

A craftsman often makes articles for own use or as gifts for relatives and friends. When there is a surplus, he takes the wares for sale to the nearby town market. This usually happens when there is more than one good craftsman in the village.

The demand for different articles varies with each season. For example, in the post-harvest season, there is great demand for baskets and paddy storage bins; since it is also the fishing season, traps are also sold.

Town markets

These are located at Karjat, Neral, Kalyan and Murbad which lie on the main access routes bordering the region. In all these towns, except for Kalyan where bamboo trade takes place every day, one day of the week is reserved for trade in local village produce like ropes, pottery items, firewood and bamboo articles. The tribal craftsmen usually bring an assortment of baskets and bins to this market.

The Buruds have a strong presence in town markets; they have fixed places where they sit with their winnowing fans and baskets. The tribal craftsman may not have the patience to sit all day until the goods are sold, and may prefer to sell them to a Burud at a lower price and return home early.

Besides the town residents, villagers from a radius of 15-18 km come to the market for their needs using the bus network. The craftsmen also make use of the State Transport buses to bring the goods to the market. Kalyan being a large vegetable and fruit wholesale trading centre, the volume of trade in baskets here is higher than in other town markets.

Earlier, small-scale, seasonal produce was efficiently distributed and exchanged among people in a locality through the weekly village market mechanism. Today, this mechanism has broken down and villagers are forced to go to the town markets to buy or sell produce that is made in the same locality.

Festival Products

Throughout the year, various festivals are celebrated to mark the beginning of a new year or the end of a season, to honour a particular god or deity, etc. Such celebrations also entail mundane activities such as cleaning out and repairing one's house, cleaning and maintaining tools, acquiring clothes and household articles, and so on. Certain bamboo products are associated with particular festivals and ceremonies. For example, during the Gowri-Ganapathi festival (in August or September), it is customary to buy new winnowing fans and replace old baskets. Before Lakshmi Pooja (October or November), new brooms are purchased. At weddings, baskets and winnowing fans are purchased for the feast and certain rituals.

Annual fairs

Important temples in the region annually celebrate certain days that mark the anniversary of consecration of the idol, or a particular event in mythology. In January, the temple at Mhase celebrates its annual *jathra*. A similar fair takes place in March at Bhimashankar on Shivaratri day. Smaller such celebrations occur at Tungi and Kadav temples.

On such occasions, people gather in large numbers. There is usually a large cattle fair, a big colourful bazaar, amusements, theatrical shows, etc. which lasts for 7-10 days. In most such fairs, there is a separate corner where lively trading of a wide variety of bamboo articles occurs. Ordinary baskets and containers are enlivened with dashes of colour that add to the carnival atmosphere and the price. Products fetch up to double their normal prices on these occasions (Table 6). Trade is brisk and articles get sold even before they are unloaded from the trucks.

Craftspersons who participate include tribals and the Buruds from a radius of 30 km, who come with their families and camp on site for the entire duration of the *jatra*. Farmers, traders and pilgrims come from as far as 100 km away. Some regular visitors patronize particular craftspersons who specially cater to their needs year after year.

Transit markets

The transit market at Tokewade represents a very different type of trade in bamboo. It is located strategically on the Kalyan-Ahmednagar highway. On every Friday, traders and agents come to Tokewade to buy large quantities of baskets. They, in turn, sell these to vegetable and fruit growers in the upland districts of Pune, Nagar and Nashik. Baskets are the main item traded; in season, some storage bins can also be seen.

Baskets are made by Thakur families who live within 20 km on either of the highway. These families are different from other bamboo craftspersons in that they practise bamboo craft as a primary occupation. Often, the entire family is engaged in weaving baskets, producing nearly 30 baskets per week, 10 months of the year,

leaving barely enough time to grow one paddy crop. Since the scale of production and sale are so high, all the bamboo resources nearby have been exhausted. As a result, craftspersons have to transfer bamboo from as far as 60 km away, thereby now increasing the cost of raw material by Rs. 2.00 per culm. A representative sample of the economics of bamboo craft is given in Table 7.

Table 6: Comparative prices of bamboo products

Articles	Prices (Rs .)			
	Village sales	Town markets	Annual fairs	Transit markets
Small basket	8.00	10.00	15.00	10.00
Large basket	15.00	18.00	30.00	25.00
Paddy storage bin	100.00	120.00	250.00	250.00
Rice bin	40.00	—	—	—
Vegetable basket	10.00	12.00	25.00	20.00
Winnowing fan	—	20.00	50.00	—
Loose-weave basket	35.00	—	—	—
Fish traps	20.00	—	—	—

Note: product is not sold in the market.

Table 7: The economics of bamboo craft for one large basket

Item	Village sales	Town markets	Annual fairs	Transit markets
Distance of raw material sources (km)	0-5	0-5	60	60
Distance of markets (km)	0-10	15-18	30	20
Selling price (Rs.)	15.00	18.00	30.00	25.00
Cost of bamboo (Rs.)				
Cost of transport (raw materials and finished goods) (Rs.)	4.0	4.00	6.00	5.00
Returns (Rs.)	11.00	11.00	12.00	8.00

The most salient aspects of the markets for bamboo items can be summarized as follows:

- It is most profitable for craftspersons to engage in informal village trade and take the surplus to town markets.
- Annual fairs provide a good profit margin; however, such fairs occur only once a year.
- Returns from transit markets are low (raw material sources are distant as local bamboo is exhausted) but the volume of sale compensates (about 30 large baskets per week compared with 8 during village sales and 15 in town markets).

summingup

After completing a year's survey of bamboo resources, bamboo products, traditional skills, and existing markets and links in the region, the following picture emerges.

- 1 Bamboo is natural to the region and is abundant in the forests. Even though the potential available stock of forest bamboo is over 60 000 tons, the full quantity is not accessible to the craftspersons.
- 2 There is an existing tradition of cultivating bamboo in backyards and village common areas. Ownership of cultivated bamboo is decentralized and dispersed.
- 3 Only two species (*Dendrocalamus strictus* and *Pseudoxytenanthera stocksii*) are cultivated and little attention is paid to improving the quality of the culms.
- 4 Most bamboo stands are owned by non-tribals. Craftspersons, mainly Thakur tribals, are forced to purchase bamboo at high costs.
- 5 The area has a live tradition of bamboo craft, and the knowledge of the craft is common, experimental and accessible to all. There is a wide variation in skill levels.
- 6 Almost all craftspersons are elderly. The younger generation does not seem attracted to craft and manual work is no longer valued.
- 7 There is considerable demand for bamboo articles at the village level. This was being met by the now-inoperative institution of weekly village bazaars.
- 8 The town markets of Karjat, Neral and Murbad are geared towards supplying mass-produced industrial products. As a result, the craftsperson with his occasional, modest, small-scale activity is left to his own devices and is thus marginalized.
- 9 Education and exposure are causing a change in the lifestyle and aspirations of the people in the villages. The craftsperson is unable to alter his range of products to suit this change and hence, inferior metal and plastic products have taken over.
- 10 Although the region is strategically located between Mumbai and Pune, the potential demand of such large urban centres for bamboo products has not been identified.
- 11 Bamboo work is seasonal, sporadic and one of a diverse range of livelihood activities. Such diversity provides considerable economic stability, and allows the individual to integrate family and community obligations, follow seasonal rhythms, and eliminate monotony and boredom.
12. The vital link between the individual, community and nature is fast disintegrating owing to the pressures of modernity.

It is evident that there is immense scope for bamboo-related development activities in the region. While the positive features need to be retained and reinforced, the problem areas offer an excellent opportunity for reflection and remedial work.

3 FUTURE STRATEGIES

The strategies outlined below are neither entirely new nor path-breaking. The attempt has been to cull, sift and weave together different ideas and locate them in a context.

The survey has highlighted the following thrust areas for planning and intervention in the future:

- Enhancing bamboo resources;
- Finding new uses for bamboo;
- Reviving existing markets;
- Creating new vocations; and
- Searching for appropriate structures.

The strategies should:

- Enable bamboo craft to become a vital complement to present livelihood activities of the people of this region;
- Provide the space to explore and utilize the multifarious uses of bamboo; and
- Revive and rekindle the craft tradition as a functional and creative medium of expression.

Enhancing Bamboo Resources

Assuring adequate supplies of quality bamboo

The potentials and problems of the existing stock are as follows:

Dendrocalamus strictus

- Sufficient quantity exists.
- Needs to make it more accessible to tribal craftspersons.
- Applications in mat weaving, crates for packaging industry, house constructions.

Pseudoxytenanthera stocksii

- Urgent need to increase stock through vegetative propagation techniques.
- The problem of “flowering yet no seed-set” must be addressed.
- Applications in intricate woven articles, attractive packaging for retail finished goods, and furniture.

Bambusa bambos

- Abundant in forests.
- As new applications are found, more bamboo could be cultivated.
- Applications in furniture, construction and structural use.

Pseudoxytenanthera monostigma

- Nearly extinct today. As it is a useful, indigenous species, there is urgent need to extensively propagate and cultivate it.
- Applications in weaving, elegant furniture and fittings.

Present harvestable stock of bamboo in the region is given in Table 8.

Table 8: Harvestable bamboo stock in the region

Type	<i>Dendrocalamus strictus</i>	<i>Pseudoxytenanthera stocksii</i>	<i>Bambusa bambos</i>	<i>Pseudoxytenanthera monostigma</i>
Forest	70%	Absent	100%	Absent
Cultivated	30%	100%	Negligible	Negligible

There is a need to ensure sufficient quantities of good quality bamboo stock over which craftsmen have control. Mechanisms that would make this possible include:

- Allotment of forest bamboo;
- Community management of forests;
- Encouragement of backyard plantations;
- Introduction of new species suitable for craft; and
- Improving clump management and preservatives treatment.

Allotment of forest bamboo

In some Indian states, such as Madhya Pradesh, communities and panchayats have historically possessed a range of legal rights over forest produce. This system is called *Nistar* and is recognized by the State Forest Departments even today. Bamboo workers obtain most of their raw material through this customary arrangement. A fixed quota of bamboo is allotted to each family at cost price or at marginally higher rates.

As 95% of the stock of bamboo grows in the forests, a similar arrangement might work well in Karjat region. Through this mechanism large quantities of bamboo at low cost will become available, substantially increasing the profit margins of craftsmen. The measure can begin with forest *D. strictus* and later, as the product range widens, *B. bambos* can be added.

While implementing this arrangement, several problems may arise. Being a top-down, centralized planning and policing outfit, the Forest Department will find it difficult to cope with so many diverse, dispersed craftsmen: how and on what basis do they identify craftsmen? Craftsmen may be reluctant to deal with the Forest Department owing to its bureaucratic and corrupt image. Another problem is that as felling of culms under such a scheme is likely to be left to contractors, harvested culms may be crooked and unsuitable for craft purposes.

In view of these and other such problems, an organization or group may be needed to help identify craftspersons, represent their interests, and mediate between them and the Forest Department.

Community management of forests

While forest allotment of bamboo is a short-term measure, community management of forests (also known as Joint Forest Management or JFM) is a more long-term and sustainable measure to restore the rights of local communities over forests.

Forest allotment entitles tribal craftspersons to a quota of bamboo harvested from the forest, whereas JFM also provides the craft community the opportunity to influence species selection, cultivation and management of bamboo.

In the last few years, JFM has become popular in several states. This program is designed as a long-term agreement between rural communities and the government that allows the community access to forest resources in exchange for serious responsibilities, such as preventing grazing, poaching and illegal felling, controlling fires, protecting forests, and reclaiming degraded forest lands.

In Maharashtra, sporadic efforts have been made by people's groups and NGOs to secure for tribals rights over forests, land and water resources. However, JFM has not been taken up in any serious way despite national and state level policy directives. It is necessary to implement the JFM concept creatively and in a substantial way in the state.

Encouraging backyard plantation

In Karjat region, backyard cultivation of bamboo is more desirable than large-scale plantations. Plantations may displace existing food crop patterns, usurp common grazing lands and tend to be monocultures. Wherever plantations are possible, bamboo can be interspersed with other valuable tree species. In this connection, the agro-forestry models developed in China and elsewhere need to be studied.

Traditionally, rhizomes have been used to propagate bamboo. Since rhizomes are inadequate to rapidly increase the extent of backyard plantations, it is necessary to set up nurseries. Nurseries can be established using either culm cuttings or seed in open spaces around the village, preferably near a water source (river, well or hand pump) where wastewater and spillage may also be used for irrigation. Women and youth, especially the Katkaris, can be trained to take up nursery work.

Initial capital may be provided in the form of a bank loan and not a subsidy. Experiences show that subsidized nursery schemes generally tend to create dependency.

As private suppliers are often unreliable, the Forest Department can be roped in to assist in providing planting material at a fee. Research institutes can supply rhizomes of potentially useful species.

Saplings can be sold to tribal cultivators keeping a profit margin for the nursery owner. Differential pricing for tribals and outsiders will prove useful. Development agencies, the government and NGOs might use these nurseries to obtain plants for their forestry and horticulture schemes.

Introduction of new species

Rapid introduction of new species suitable for craft will require mass propagation techniques. Although tissue culture method is capable of providing a large number of propagules from a limited stock, it is unsuitable for use at the village level since it requires a centralized and energy-intensive establishment, a controlled environment, trained personnel, and intensive supervision. Moreover, since tissue culture produces clones from one mother plant, growing these clones on a large scale may adversely affect the genetic diversity of the species. Although some attempts have been made to bring down costs and simplify the technique, it is still a difficult method to implement in most rural locations.

An Experimental Bamboo Nursery

The following method has been tested by the author.

A raised bed of 5 x 6 feet was prepared with good loosened soil, and 150 g of *D. strictus* seed was sowed and covered with a thin layer compost. Germination began in 5-6 days and continued up to 20 days (90% germination occurred).

Plastic bags were filled with a mix of 50% rich soil, 25% leaf compost and 25% river sand. Large bags (6 x 9 inches) were used to provide sufficient space for rhizome growth as the plants were to be kept in the nursery for at least 15 months. The 6-8 inches high saplings (about 45 days later) were transplanted into the plastic bags. These were kept in a partially shaded area and watered daily. Rhizomes began to form in 3-4 months. After 15 months in the nursery, the plants were ready to be planted out.

The best time to start the nursery is February-March. The expenditure incurred for 100 saplings was:

Cost of seed, soil, manure, tools, plastic bags, filling and transplanting	: Rs. 0.80/sapling
Labour costs for watering de-weeding (at the end of 15 months)	: Rs. 2.00/sapling

As only 85% of the plants survived after 15 months, the cost per sapling increased to Rs. 2.35.

Two other techniques of mass propagation seem more applicable at the village level:

1. Propagation from bi-nodal culm cuttings, a technique developed at the Kerala Forest Research Institute. Nodes of culm cuttings are treated with a solution of naphthalene acetic acid (NAA) and planted in a nursery bed. Roots and shoots develop at each node.

2. Rapid clonal propagation. Seed treated with NAA accelerates rhizome formation, and tillers can be separated every 4 months. Thus, a large number of plants can be generated from a single seed.

The species potentially useful and most suited to the agro-climatic zone are listed in Table 9.

Table 9: Species that have the potential for introduction into Karjat region

Species	Features	Potential use	Natural habitat	Source
<i>Bambusa tulda</i>	Long internode, thin-walled, inconspicuous nodes	Kitchen & household items, furniture	C & E Bengal, Assam	Botanical Garden, Calcutta; FRI, Dehradun
<i>B. nutans</i>	Thick-walled, inconspicuous nodes	Woven products, packaging	Lower Himalayas	-do-
<i>B. balcooa</i>	Thick-walled, strong, prominent nodes	Construction, packaging	Assam, lower Bengal, Bihar	-do-
<i>Dendrocalamus hamiltonii</i>	Long internode, thin-walled	Woven products, containers, furniture	NE Himalayas, Assam, Darjeeling	-do-
<i>D. giganteus</i>	Very large culm diameter, thin-walled	Containers, kitchenware	Malay Peninsula	-do-
<i>D. asper</i>		Edible shoots		TFRI, Jabalpur
<i>Ocblandra travancorica</i>	Narrow, very thin-walled	Furniture	Tirunelveli, Parts of Kerala	KFRI, Thrissur

Note: = information is yet to be collected

Improving clump management

Valuable work on clump management and harvesting techniques has been done by various agriculture, research and forestry institutes. However, this information has not reached bamboo growers and craftspersons as most dissemination and extension programs are aimed at literate, organized segments of the population. There is an urgent need to make available this information in local languages, especially for neo-literates, and disseminate this material effectively so that it reaches farmers and cultivators in remote places. Some networking may also prove useful.

Many field-level problems that the growers and artisans face (pest attack, no seed-set, high die-back rate, etc.) today remain unaddressed and unsolved. It is essential to develop a forum where growers and artisans can interact with botanists, agronomists, foresters, etc. to solve such problems. In return, field-level problems can become the starting point for future research.

Preservative treatment

This is essential to increase product durability and quality. Most reliable preservative treatments are highly toxic and hazardous at the treatment site. It is claimed that once the treated culms are properly dried, there is no hazard while handling the material or even when the product is in use. Nevertheless, people have resisted the use of chemically treated bamboos for house construction, water-storage structures, furniture and household articles. This is a major limitation when attempting to make products that are for long use.

Preservation techniques need to be well-tested before being prescribed. Also, as treatments are most effective on green bamboo, preservation must become a part of the harvesting and storing process. There is a definite case for exploring preservatives derived from natural sources (usually plant) as they are often non-toxic.

Listed below are some prophylactic and preservative methods suggested by tribal people and some experts.

- Harvest during low-sugar (in the culm) period (August-December);
- Harvest during waning moon;
- Harvest only mature culms;
- Keep culms upright after felling with branches and leaves intact;
- Soak culms for 4-12 weeks, preferably in running water;
- Apply a coat of cashew-shell oil;
- Steep splits in a decoction of tobacco and water;
- Steep splits in decoction of fruits of Bor (*Zizyphus jujuba*) or heartwood of Khair (*Acacia catechu*);
- Apply Biba (*Semecarpus anacardium*) seed oil to finished products and smear with wood ash; and
- Bamboo poles in contact with the earth are to be given a lime wash or tar coating when used structurally.

Finding New Uses for Bamboo

New markets at the urban and regional levels

Despite many homogenizing and levelling tendencies operating in the society today, the world of the tribal craftsman is very different from the urban and industrial world. It is difficult for the craftsman to perceive let alone address the needs of such a distant world.

If bamboo craft has to cater to the needs of urban and industrial users, there is need for a bridge in the form of some link organization or group. This will initially be a platform for urban and industrial consumers, designers and craftsmen to meet, understand each other, and work together. Later, it can assist craftsmen market new products developed and represent their interests when dealing with industry or large-scale urban customers.

The urban consumer tends to have a bad opinion of bamboo. It is seen as a poor man's timber, and the products as crude, impermanent objects. There is need to demonstrate that this bias has no basis and that countless articles of striking beauty and utility can be fashioned from bamboo.

There is immense potential, as yet unexplored, for the bamboo sector to serve the following industries: packaging, furniture, interiors, household durables and house construction. The availability of bamboo treated with non-toxic preservatives will become a critical factor as a variety of products are made for new markets.

Artisan-designer interaction

During such interactions, well-informed designers will begin to appreciate and understand bamboo as a material and explore its potential use. Industrial designers, architects and interior designers can further test and refine their ideas along with craftspersons. The craftsperson, in turn, will be exposed to many new ideas and useful tips, and get a glimpse of markets that these designers serve.

Design workshops could be a step in this direction. These could be general exposures or highly focused and specialized designer-artisan interactions. For example, a chair designer may come forward to work with craftspersons to make good bamboo chairs, or an architect may design bamboo doors and windows with craftspersons.

Artisan-user interaction

User feedback is one of the best ways to propel a craftsperson to redesign his product and generate new ideas. The power of this mechanism should not be underestimated. Getting negative comments from a customer will set any craftsperson thinking. There must be occasions when the craftspersons and end-users come face to face. This might take the form of an interactive exhibition-cum-sale in which craftspersons themselves participate, not just link agencies and other intermediaries. Interactive exhibitions and exposure camps that feature a range of bamboo products can help dispel any bias or resistance on the part of urban buyers to use bamboo products.

Artisan-artisan interaction

Training, exchange programs and exposure workshops with skilled craftspersons from other parts of the country, or even the world, will help stimulate ideas and upgrade skills considerably. Tips on fabrication, preservation, storage and different marketing techniques may be shared and exchanged at these meetings. Relevant and appropriate product design will be the natural outcome of such diverse interactions.

Reviving Existing Markets

Increasing interactions between craftspersons and users

Craftspersons are unable to fully meet the high demand for bamboo articles that exists today in villages and small towns. The reasons for this probably are:

- Traditional avenues for sale and interaction with buyers have closed;
- The number of craftspersons producing articles for the market is drastically dropping; and
- Those who are active are unable to adapt to the changing needs and tastes of the village people.

There is ample scope to revive the weekly village bazaar that provides a close link between craftspersons and buyers. Regular, repeated interactions with a relatively homogeneous group of residents provide immediate Teed-back on the quality of goods sold and the design appropriateness of the product. As the artisan is able to gauge preferences and needs, significant product development can take place following such direct interactions.

Weekly Markets

The tradition of weekly markets has died out in Karjat over the last 15-20 years. These markets provided local people with a wide range of products and services for which they now have to travel 15-20 km. Local agricultural produce, dry fish, salt, spices, cloth, pottery, iron-ware, bamboo articles, trinkets, toys, sweets, etc. were some of the merchandise sold at these bazaars. The barber, tailor, travelling dentist, traditional healer, acrobat, tinker, etc. provided necessary services and added to the ambience of this gathering. A system of barter was extant, where a fish trap or basket could be exchanged for two measures of rice paddy. Such markets were active centres where not just daily necessities, but also news, gossip and ideas were traded.

A catalyst- an artisan co-operative, a marketing outfit or a local NGO-is required for such a revival. There is a need for detailed case studies of existing weekly markets in other parts of the state; this will help shape and direct ideas for revival.

Even if the outcome of the revival effort is quite different from what existed earlier, craftspersons may find it worth their while to take up bamboo work for the market. Today, selling their products is a painful affair-going long distances to town markets, being harassed by bus conductors, beat constables, etc.

Demarcating a separate space within existing town markets for village produce (seasonal and regular) might be a strategy worth considering. The feasibility and implications need to be analysed.

Simultaneously, it is necessary to reassess the buying potential and preferences of the village and small town buyers. Bamboo can easily replace many crude, high-volume industrial products, commonly found in middle-class homes. Focused market surveys can reveal details and possibilities.

While active product design for this sector is necessary, it is equally essential that this process takes place through close interactions with craftsmen, keeping in mind their skills and abilities.

Tool upgrading

Appropriate tools will become necessary as different products are generated for new and existing markets that seek new looks and details. One way to address this requirement is to adapt tools from other trades. Hand tools are the easiest to adapt and use as they can be made and repaired by local blacksmiths.

Mechanization may be used for certain processes that require mindless mass production or a high degree of standardization. However, while mechanizing any process, the focus must be the craftsmen who should have full control over the entire production process.

Pedal-powered devices and machines that have a low energy consumption are more suited to rural locations where power supply is intermittent and unreliable.

Creating New Vocations

Encouraging more people to take up bamboo craft

The confidence and self-image of tribals have suffered a breakdown over the years. Not only has their traditional relationship with their environment been destroyed but they are also made to feel backward and inferior. Today they are quick to emulate mainstream behaviour and cultures. They have become more individualistic and self-centred, shedding their earlier community-oriented ways. Land and forest-based activities and craft skills are being discarded for semi-skilled and blue collar jobs. Education and consumerist forces have drastically altered the attitudes and aspirations of craft working communities.

It is necessary to explore for tribals alternative vocations and new occupations that reflect some continuity with their past and encourage them to retain their valuable traditions. At the same time, new skills and abilities need to be inculcated in them to help them cope with existing problems and integrate in a rapidly changing world. Bamboo craft can be the beginning of such an effort.

Since most tribal children drop out by middle school, a carefully designed apprenticeship scheme with bamboo craftsmen might provide them with viable occupation. Apart from craft skills, the elements of account-keeping, costing and marketing should also be taught in this scheme. Besides a planned structure that takes into account the needs, capabilities and potentials of both the craftsman

and the apprentice, such a course will also require external information and monetary supports.

On another plane, it is equally necessary to sensitize urban and mainstream populations to the importance of craft and manual work in a humane, healthy society. It is possible to include bamboo craft in a lively and useful way within the work-experience curriculum at school level. Many states have introduced bamboo work into the curriculum, but this is not being implemented as teachers are ill-equipped to handle the subject. Short-term teacher orientation camps are necessary to rectify this or the idea will continue to remain just on paper. Bamboo craft and design modules can be introduced also in polytechnics, industrial training institutes, and architecture and design schools. Serious thought and planning should go into the organization of bamboo craft courses. The relevance of such an approach is considerable in this age where “work” has become dehumanizing, alienating and exploitative on the one hand, and physically stressful and emotionally debilitating on the other.

Searching for appropriate structures

While the thrust areas present several avenues for constructive and relevant work, there is a pressing need for an agency that will facilitate the critical interventions called for. Such an agency would ideally represent the interests of bamboo craftspersons and cultivators, and promote the interests of the bamboo sector in this region. Its scope may range from raw material procurement and solving field-level problems to skill upgrading and marketing of finished products.

Experience has shown government development agencies to be ineffective in addressing these issues. NGOs that usually take on the role of a facilitator are unable to do justice as their sustenance is often dependent on outside sources that are not directly connected to bamboo or craft sectors.

Among the present range of institutional structures, that of a cooperative society seems better suited to serve the needs of bamboo and craft sectors. Craftspersons and bamboo cultivators from the region would constitute the society. As their sustenance is directly dependent on the health of bamboo and craft sectors, it would be in their interest to keep the society economically viable. Such a cooperative society would also provide the facilities for “non-commercial” activities, such as training and networking, which will enrich the sectors.

Focused studies and trials are necessary to see how the cooperative society framework can be imaginatively used to further the interests of bamboo and craft sectors.

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ANNEXE

Some Key People and Organizations

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Indian Council of Forestry Research & Education,
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Unmesh Kulkarni (Designer),
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