

## Plants in material culture of tribals and rural communities of Rajsamand district of Rajasthan

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While early studies into material culture often concentrated on items collected from archaeological investigations, current studies demonstrate an increasing interest in the *artefacts*, or man-made objects of existing traditional societies. For the material culture of a given society refers to the total range of objects produced by that society, including functional items such as tools, shelter and clothing as well as more decorative arts and crafts. Traditionally, many of these items have been made from plant materials. The use of plants in traditional art and technology remains an important aspect of traditional botanical knowledge (TBK). The paper discusses the current roles of plants in the manufacture of traditional goods, and outlines some of the specialist skills which are involved in the production of such items.

**Keywords:** Ethnobotany, Traditional knowledge, Traditional goods, Traditional *artefacts*, Tribals, *Bhil*, *Garasia*, Rajsamand, Rajasthan

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Man from the beginning has had a tendency to draw material from nature for his use. The identification of plants useful to man from among natural stands commenced in pre-historic times. Several of these plants catering to basic human needs, such as food, clothing, shelter, etc. were domesticated. Rajsamand district having an area of, 4564.12 sq km is situated in between the parallels 24-46' to 26-01' North latitude and 73-28' to 74-18' is East longitude. The total population of the district is 10,14,137, out of which the tribal population is 7,04,790. The district includes seven *Tehsils*, i.e. Rajsamand, Amet, Kumbhalgarh, Nathdwara, Railmagra, Devgarh and Bhim. The district is situated in the southern part of Rajasthan. Chittorgarh and Bhilwara districts lie on its eastern side whereas on its North, West and South lie the districts of Ajmer, Pali and Udaipur, respectively. As the district is dominated by the rural and tribal population, it is an ideal district for taking ethnobotanical studies. A lot of work has been done on ethnobotany of wild plants in Rajasthan, no such work has been done on the district of Rajsamand which forms part of the hilly tracts of Aravalli hills<sup>1-9</sup>. Some of the hilly tracts of the district especially Jargah hills, Parsram Mahadev, Kumbhalgarh, Kamlighat, Gorumghat, etc. are

endowed with rich vegetation and the tribals of these hilly tracts have learnt to utilize their plant diversity to meet their basic needs.

### Methodology

Ethnobotanical survey was carried out in the district of Rajsamand during 2004 to 2006. Besides the surveys, information was also gathered through secondary sources from the district. The survey was primarily of two types viz. intensive (involving detailed studies of one or two villages at a time by staying there for a week or so) and extensive making the village as a camp and doing extensive work within several villages or localities in its radius. Data were collected by interviews, observations and participation. On reaching a village or locality, rapport was established with one or two persons preferably the chief and contact was then established with other tribals of the locality. Enquiries were made on the plant material used in different artefacts. Generally, two types of interviews were taken, firstly of individuals and secondly of groups. Of individuals, persons were selected at random on the way or entering a hut finding out knowledgeable individuals from the village or also the *Bhopa* (village priest) or the headman. In group interviews, more than one individual were approached. In forests with the ambient vegetation before them the tribals were

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prompted to remark on the utility of species especially when accompanied by a group. In smaller groups womenfolk were lesser in number, but both the sexes were represented in larger groups and resulted in heterogeneity of information. Persons mostly above the age of 60 have accurate information regarding their old traditions. Participation in their feasts, festivals, other social events, etc. was of great use in collecting information on plants and observing how they are used. The samples of such plants were identified and herbarium sheets prepared. The herbarium specimens of such plant species have been deposited in the laboratory of Ethnobotany and Agrostology, Department of Botany, College of Science, Mohanlal Sukhadia University, Udaipur.

## Observations

### Plant materials used in construction

#### Timber plants

As in most societies, timber remains fundamental to traditional life particularly in the construction of both temporary shelters and more permanent homesteads. The characteristic dwellings built by different peoples very enormously in their design and construction, according to both the material available, and the prevailing environmental conditions. Locally available plants from the nearby forests are used for the construction of the skeleton of the hut. Broadly, a hut consists of pillar, beam, rafter, poles, purlins, plank, door frame, lintel, wall, and thatch, etc. The woods of various plants used in the different parts of huts are given (Table 1).

#### In and around huts

Near the huts, 2.4-3.0 m high platform is erected which helps in storage of fodder as well as keeping an

eye over the fields. During the day, cattle are tied below this platform, which is called a *Daglo*. The huts have generally only one room. In a partition made by bamboo mats, cattle are tied in a corner. Usually in the middle of the hut close to the wall, 2-3 granaries are kept for storing grain. From the ceiling of the hut, storage bins, hanging baskets and *Lagenaria siceraria* fruits storing seeds may be seen. Inside huts, near the gate, 2-3 cots usually exist, below which is the mortar and nearby a hand grinding mill. Some domestic articles like the bow and arrows, *Gophan*, etc. hang from the walls. Near the hut gate on the outside, vessels holding water on stands may be seen. A fencing using various live plants or dead ones or their wood is generally seen with an opening which forms the gate. Some of the plants constituting the fencing are *Euphorbia nerifolia*, *Jatropha curcus*, and *Dendrocalamus strictus*. Some of the useful climbers spread over the fencing planted ritually by tribals are *Lagenaria siceraria*, *Dioscorea bulbifera*, etc.

### Traditional agriculture implements

Agriculture is one of the important occupations of the tribals. Their fields are close to their huts. During early days they used to carry out slash and burn agriculture, which compromise of cutting trees from the ground to clear it and burning the same. After 45 yrs, they would choose another place for growing their crops, but this practice is in vogue now. Usually, traditional techniques and implements are used by them. They construct their own implements or take the help of a carpenter. The plough, yoke, harrow, cutter, seed drill, etc. are chief agricultural implements.

#### Plough

The implement has generally three parts, viz. body, shaft, and share. The body or the handle is roughly 1.21

Table 1 — Plant species and their uses by the aboriginals of Rajsamand district

Mode of use	Plant species used
As timber	<i>Azadirachta indica</i> , <i>Acacia nilotica</i> , <i>Acacia leucophloea</i> , <i>Aegle marmelos</i> , <i>Albizia lebbek</i> , <i>Bombax ceiba</i> , <i>Butea monosperma</i> , <i>Cordia ghara</i> , <i>Derris indica</i> , <i>Ficus racemosa</i> , <i>Holoptelia integrifolia</i> , <i>Madhuca indica</i> and <i>Mangifera indica</i> .
As constructive material	<i>Butea monosperma</i> , <i>Dendrocalamus strictus</i> , <i>Tectona grandis</i> , <i>Azadirachta indica</i> , <i>Calotropis procera</i> , <i>Madhuca indica</i> , <i>Mangifera indica</i> , <i>Acacia nilotica</i> , <i>Jatropha curcas</i> , <i>Ficus bengalensis</i> , <i>Bombax ceiba</i> , <i>Saccharum bengalense</i> , <i>Desmostachya bipinnata</i> , <i>Themeda quadrivalvis</i> , <i>Apluda mutica</i> , <i>Saccharum spontaneum</i> and <i>Phragmites karka</i> .
Other implements	
<i>Medvaa</i>	<i>Acacia nilotica</i> , <i>Butea monosperma</i> , <i>Madhuca indica</i> <i>Cordia gharaf</i>
<i>Rehat</i>	<i>Acacia catechu</i> , <i>Acacia leucophloea</i> , <i>Anogeissus latifolia</i> <i>Boswellia serrata</i> , <i>Butea monosperma</i>
As ropes, cords and strings	<i>Phoenix dactylifera</i> , <i>Butea monosperma</i> , <i>Hibiscus cannabinus</i> , <i>Crotalaria juncea</i> , <i>Bombax ceiba</i> , <i>Derris indica</i> , <i>Holoptelia integrifolia</i> and <i>Abelmoschus-moschatus</i> , <i>Phoenix sylvestris</i> and <i>Typha angustata</i> .

m in length by which the farmer holds the plough. Below it is a share, the wood of which is roughly 0.30 m in length at an acute angle towards the shaft. The latter is attached at the middle of the body and is 2.13-2.43 m in length the fore part of which is attached to the yoke. To the share at its lower end which digs the soil, an iron structure, called *phalia* is attached. The usage of the wood depends on its availability and preference.

#### Yoke

The yoke is the structure by which a plough is tied to the neck of the oxen. Generally 3 kinds of yokes are found. In the simplest type, 1.21- 1.52 m long of wood is tied to the neck of the oxen with the help of sharps of fibre called *Jotri*. *Crotalaria juncea* is the most commonly used fibre. In the other two types of yokes, the wooden log is tied to the neck of oxen with the help of *Acacia nilotica* and *Azadirachta indica* or other wooden structures. The choice of the wood rest on the consideration that it is light and does not cause wounds.

#### Harrow or Kalpi

The function of this implement is to break the clods, etc. after ploughing. It fundamentally consists of a 3.5 m long metal blade fixed to the lower end of a wooden plank which has a 7.01 m long handle. With the aid of two long wooden poles, the harrow is tied to the yoke.

#### Leverller of Pata

After the first ploughing, to level the field, a 2.13-2.74 m long wooden plank tied to the yoke with ropes or iron chains is pulled by the oxen. Generally to add weight, the farmer stands on the leveller while the oxen pull it. In another form of a leveller, instead of wooden or metal chords, two long wooden poles may be used.

#### Seed-drill

This comprises of a long hollow bamboo pipe with a funnel shaped opening at the upper end made by splitting the bamboo and using iron rings and leather. After levelling along with ploughing, the seed drill is tied behind the plough or held by an accomplice of the farmer who walks behind the plough, trickling seeds from the upper end which fall in the furrows.

#### Vitani

For watering the field, beds are created with the help of an implement, which consists of a wooden piece with comb like serrations at its lower end and a long pole at its other. For harvesting the crops a sickle (*daranti*) is

used. Sometimes, underground parts are removed with the help of a spade (*phawda*). The harvested crop is collected with the help of long forked sticks.

#### Medvaya

There is the central wooden pole on the threshing floor (*medi*) around which the harvested grain with husk is piled and oxen tied to this pole are made to move round and round comprising the act of threshing. The oxen are tied to the pole with the add of a bow like implement along with ropes called the *medvaya*. The traditional plant materials used in the construction of the implements enumerated above are listed.

#### Irrigation

In the absence of modern amenities in the vast majority of the area, they are only able to grow the *kharif* crop. In some places, wells are dug and persian wheel, *charas* and *rehat* are used for irrigation. Several woods are used for the construction of a well site, the chief ones being *Acacia catechu*, *Anogeissus latifolia*, *Diospyros melanoxylon*, *Terminalia tomentosa*, *Wrightia tinctoria*, and *Ziziphus nummularia*. The drain leading from the well to the place, where water is collected in buckets and pots is carved out of the bole of *Boswellia serrata*, *Butea monosperma*, and *Phoenix sylvestris*.

#### Persian wheel or Rehat

Some wells have quite a complex kind of irrigation mechanism which involves a circular wheel like structure to which are tied, at regular intervals clay pots. The *Rehat* is operated by men or by oxen (Fig. 17). Woods of *Acacia catechu*, *Acacia leucophloea* and *Anogeissus latifolia* are used for the construction of spokes of wheel; *Acacia catechu* and *Anogeissus latifolia* are used for the construction of axle of wheel; *Boswellia serrata*, *Butea monosperma* and *Phoenix sylvestris* are used for the construction of water drain; root fibre of *Butea monosperma* is used for preparing rope.

#### Dhenkli

In ponds, when the water dries in winters in some areas, *Jaiyad* crops are raised. In the ponds, a *kuccha* wall is dug, near which a forked pole is planted. From between the forks, another long pole 3.65-4.57 m in length is made to pass. On one end of this pole away from the well a heavy stone is tied while with the aid of a rope a bucket or any other vessel is hung. The rope is pulled down till the vessel is immersed in water (generally at the depth of 2.43-3.04 m) and when

released the vessel full of water comes up by the weight of the stone at the other end.

## Transport

### Cart

In the hilly areas as the topography of the land is undulatory, the use of bullock carts is not very much prevalent; however, the situation is different in plain areas. The various parts of the cart are made of wood. Woods of *Acacia catechu*, *Acacia nilotica*, *Azadirachta indica*, *Diospyros melanoxylon*, *Tectona grandis*, *Terminalia tomentosa*, *Ziziphus mauritiana* and *Albizia lebbek* are used for the construction of the body of the cart. The wheels are made by joining several curved pieces of wood. The rim of which at many places is fixed using iron. The woods used in Rajsamand are *Acacia nilotica*, *Cassia fistula*, *Dalbergia sissoo* and *Azadirachta indica*.

### Wheel barrow or Gada

The simple construction is used to transfer grass, bundles of wood and rubble from one place to another. In its simplest form it comprise of two small wheels, which are tied to the yoke with the help of two diverging sticks and tied to the oxen. Bully is constructed from the wood of *Acacia nilotica*, *Butea monosperma*, *Diospyros melanoxylon*, *Syzygium heyneanum*, *Tamarindus indica* and *Azadirachta indica* and wheel is constructed from the wood of *Butea monosperma*, *Diospyros melanoxylon* and *Wrightia tinctoria*. For transferring materials in the fields, large planks with the help of ropes are strictly tied to the yoke and are pulled by the oxen.

## Devices against farm enemies

The farms of tribals are either near the huts or far away situated in the midst of forests or in its proximity. The crops in the fields are prone to attack and damage by various animals and birds. Different techniques are used by tribals to frighten away or prevent farm enemies.

### Gophan (Sling)

*Gophan* is a sling, woven of plant fibres (usually *Crotalaria juncea* and *Hibiscus canabis*) with a broad collar in the centre forming a sort of a loop (Fig. 18). A stone is placed in this collar and the distal ends of the strings of either side are held in the hand. The person then whirls it with an increasing speed which produces a whirring sound or releases one of the strings which causes the stone to fly like a projectile both effective in frightening birds.

### Rakhavala / Manis

The tradition of effigies resembling human forms in farm to save the standing crop from birds and other animals is centuries old. They are known by several names *Bijuka*, *Rakhawala*, *Howa*, etc (Fig. 19). In tribals villages, various kinds of figures resembling human are erected in the crop fields, generally at a height of 3.04-4.57 m. Bamboo or other wooden sticks are tied crosswise and planted in the ground by tying grasses and leaves to these sticks giving the shape of hands and head. These are given human shapes and even covered with long clothes. In some places, these may even be decked with bows and arrows. Sometimes clothes stuffed with grasses, etc. tied with bows and arrows are suspended from trees growing in the fields.

## Other techniques

Amongst certain crops as wheat, bamboo sticks with dried *Butea monosperma* leaves tied at their upper ends are planted at several places in the field. With the blowing of wind, the leaves colliding against each other produce a sound that frightens away birds and animals in the night. Instead of *Butea monosperma*, one or two mature leaves of *Tectona grandis* may be tied instead. In principle this technique of frightening pests is similar to the *Halan* of the *Sahariya* tribals, though the latter is a more elaborate form<sup>4</sup>.

## Domestic articles

### Kitchenware

#### Doila-katora

This is designed to carry fire from one place to another. It is made of *Butea monosperma* leaves rolled into a funnel shape and tied with string derived from the buck of *Helicteris isora*.

#### Head rest or Aduni

*Aduni* round in shape in cushion form is made of *Butea monosperma* leaves. In the Rajsamand, an *Aduni* is woven out of string from *Crotalaria juncea* fibres (Fig.20).

#### Flour kneading through or Kasrot

To knead the flour a large circular utensil with raised margins generally made of a single wooden block is curved. Woods of *Acacia leucophloea*, *Azadirachta indica*, *Boswellia serrata* and *Wrightia tinctoria* are used for making a *Karat*.

**Bread rolling board-Chakla**

Circular in shape and generally 2.54-5.08 cm in thickness is the bread rolling board of the tribals. It is generally made up of *Delbergia sisoo* or *Acaia nilotica* woods.

**Bread roller pin or Belan**

Generally for making bread from the dough of maize flour, no roller pin is required as the rounded dough ball is beaten between the hands into round flat shapes. However, during surveys, an about 0.22-0.25 m long hollow culm of bamboo was seen in use for the purpose. Roller pins are also made of the woods of *Albizia lebbek* and *Acacia nilotica*.

**Wind blower or Phunkni**

To ignite or increase the flame of a fire, air is blown with the help of a hollow bamboo cylinder by the tribal women.

**Funnel**

To pour a liquid from one vessel to another, a unique funnel is used designed by boring a hole at the tip of the narrow end of a hollow *Lagenaria siceraria* fruit cut into a half.

**Churner or Ravaiya**

Generally, two kinds of churners are seen amongst the tribals. One designed from a long bamboo culms, one of the ends of which is split into several portions which are separated from each other (away from the central axis by thrusting a wooden piece or stone); the other type of churner has two portions, viz. a long shaft and a cross shaped piece fixed at its base. Woods of *Acacia nilotica*, *Acacia senegal*, *Calotropis procera*, *Clerodendron phlomides*, *Ficus bengalensis*, *Mangifera indica*, *Wrightia tinctoria* and *Dendrocalamus strictus* are used for making such a type of churner. The pot, in which curd is churned, is covered by a circular lid at its mouth. The lid has a central hole through which passes the shaft of the churner, made of *Wrightia tinctoria* wood (Fig. 21).

**Chatu**

*Chatu* is generally made of a single wooden piece with a broad carved end and a narrow long handle. The woods of *Acacia senegal*, *Bombax ceiba*, *Calotropis procera*, *Capparis decidua*, *Prosopis cineraria* and *Wrightia tinctoria* are employed in the making of a *chatu*. Two other types of *chatu* can also be seen in a Tribal kitchen. One comprises of a dry hollowed fruit shell of *Lagenaria siceraria* with a hole of a suitable

diameter cut in a belly. A split half of *Cocos nucifera* fruit fixed to a long bamboo stick may also be used as a ladle.

**Patters, bowls**

Just like metal dishes and bowls, leaves of particular plants are sawn and fashioned into platters and bowls which are in daily use or used in feasts. For their construction, *Butea monosperma*, *Diospyros melanoxylon*, and *Ficus bengalensis* are used.

**Winnowing fan or Supra/Sup**

For removing chaff from the grain, the winnowing fan (Fig. 22) is indispensable in a tribal and rural people household. While in the hilly areas these fans are fashioned by knitting bamboo splints lengthwise, *Saccharum bengalense* culms are used in the Rajsamand.

**Hand grinding mill**

The circular stone pieces of hand grinding mills are made by members of the *jogi* community. The handle and the pivot of these mills are essentially made of *Acacia nilotica*, *Butea monosperma* or *Dalbergia sissoo* woods.

**Mortar or Okhla**

The use of an *okhla* is made for pouring maize or other grains. In some places, it is made of stone, in others it is made of the woods of *Acacia leucophloea*, *Wrightia tinctoria*, *Acacia nilotica* and *Albizia lebbek*. Generally, a mortar is embedded in the ground forming the floor of a hut.

**Pestle or Musal**

The pestle is carved out of a single wooden piece and is a cylindrical structure primarily though there may be some variations region wise e.g. a broad basal end or a lesser diameter in the centre. Wood of *Acacia catechu*, *Azadirachta indica*, *Butea monosperma*, *Cassia fistula* and *Dalbergia sissoo* are chosen for making a pestle.

**Tiffin**

The cowherds or the goatherds going to the forests for the whole day carry their food with them in tiffin like structure prepared from fresh *Butea monosperma* leaves.

**Storage****Water vessels**

Dried fruit shells of *Cucurbita moschata* or *Lagenaria siceraria* are sometimes employed for storing water (Fig. 23).

### *Pitcher stands*

Generally, the forked woods *Anogeissus latifolia* are planted in the ground and the pitcher is held between the forks at the upper end. A split hollow stem from a species like *Boswellia serrata* held into place horizontally by two forked wooden branches at either ends serves to keep 2 or 3 pitchers with the aid of some stone (Fig. 24). On the ground, *adunis* made of *Crotalaria juncea* fibres or leaves of particular plants are used.

### *Granaries or Kubla*

Granaries are designed by slender twigs or stripes of the stem of particular species like *Calotropis procera*, *Clerodendrum phlomides*, *Dendrocalamus strictus*, and *Nyctanthus arbor-tristis*. In some places, when storage for a longer time is planned, these granaries are plastered with clay and cow dung often sealed above (Fig. 25). Storage bins of a similar size may be designed from *Butea monosperma* leaves. Sometimes such bins may have beautiful round shapes with a hole, while the structure is reinforced by the split portions of long *Abelmoschus esculentus* and *Abelmoishus moschatus* fruits. The latter may be hung from the ceiling and store items like dry *Cassia tora* leaves<sup>4</sup>.

### *Seed storage vessel*

Dried hollowed fruit shells of *Lagenaria siceraria* or small circular bamboo baskets with lid are used for storing seeds to be used in the next season (Fig. 23). The seeds of certain *Cucurbits*, while still with some pulp adhering, are stuck on the walls of the hut, where they remain till they are removed for sowing in the next season.

### *Baskets or Topla*

Bamboo culms are the chief materials for making baskets of various shapes and sizes (Fig. 26) and functions like keeping clothes, bread, fodder, or even poultry (by keeping them upside down over the chickens or hen). The plant equivalent to bamboo for basket making in the Rajsamand is *Clerodendrum phlomides* and *Dendrocalamus strictus*.

### *Baskets or Chinka*

Hanging basket is made of bamboo strips, which is disk shaped and with the aid of strings hung from the ceiling (Fig. 27).

### *Koiza*

To keep chickens and hens safe from cats and other animals, structures are designed from bamboo, which may be funnel shaped with a long stem planted in the

ground or cylindrical, which are hung from the ceiling. Both are covered by circular lids to keep poultry inside (Fig. 1).

## **Furniture**

### *Ladder or Lahani*

To climb up to the roof of a hut one may see wooden ladders leaning against the wall of hut. Three kinds of ladders could be seen in tribal villages. Woods of *Butea monosperma*, *Diospyros melanoxylon*, *Acacia nilotica*, *Holoptelia integrefolia* and *Dendrocalamus strictus* are used in ladder making.

### *Cot or Macha*

A cot generally has, besides its fundamental framework, a matting of strings woven from such species as *Crotalaria juncea* or *Hibiscus cannabinus*. Tribals of the hills even weave this matting with long strips of bamboo. Following species constitute the framework of the cot: legs of *Delbergia sissoo*, *Derris indica*, *Acacia nilotica* and *Azadirachta indica*; body of cot by *Acacia nilotica*, *Azadirachta indica* and *Cordia gharaf*.

### *Cradle or Palna*

Cradles are made of bamboo strips and may be hung from such places as the ceiling of the hut, stout branches of a tree or a horizontal pole held by two conjoining wooden poles holding it into places at its either end (Fig. 2).

## **Hygiene**

### *Scrubber*

The fibrous mesocarp of *Cocos nucifera* is used for scrubbing pots and utensils. Coconuts are brought from distant places for many social or religious ceremonies.

### *Brooms or Buhari*

The culms, twigs, fronds of certain species or even the whole plant in case of herbs are tied into a bundle which serves as a broom. *Dendrocalamus strictus* (splitted culms), *Phoenix dactylifera* (fronds, inflorescence) *Eremopogon foveolatus* (whole plant) are used for making brooms.

## **Daily life**

Normally, strips from the culm of *Dendrocalamus strictus* or *Phoenix sylvestris* fronds are used for making mats. A mat is a very useful article in a tribal hut on which he may sit, sleep or use it as a gate or even a

shed. Fanciful hand fans are woven out of *Phoenix sylvestris* fronds (pinnae). One internodal length of a stout bamboo with one of its ends chiselled into a sharp edge tapering in to a point is used as digger for digging underground parts of plants in the forests. *Biran* is used for felling down fruits of *Mangifera indica*, *Diospyros melanoxylon* and *Syzygium cumini*. It consists of a long pole, usually of bamboo-split at one of its ends which is given the shape of a network (Fig. 3).

#### *Rope twiner or Rentiyo*

A hole is made in the stick of *Butea monosperma* or *Acacia nilotica* into which a bamboo is inserted. Typing fibres to one end of the stick and holding the bamboo, the stick is revolved continuously which results in the twining of a rope from the crude fibres (Fig. 4).

#### *Rope twiner or Dheru*

A piece of *Derris indica* wood is inserted and fixed in the hole passing through two sticks held crosswise. The fibre is tied to the upper end of the *Derris indica* wood, while the *Butea monosperma* and *Acacia nilotica* sticks are continuously rotated (Fig. 5).

#### *Rain hood or Ghughdi*

The rain hood is commonly seen amongst the tribals of Rajsamand and appears like an elongated winnowing fan in shape with an extra raised margin. The skeleton of this hood is made of bamboo which is covered by a thick mat of *Butea monosperma* leaves held in place with the help of strings (Fig. 6).

#### *Dengla*

To check young calves from running away beyond audible distance, a heavy cylindrical piece of wood is tied to a rope the other hand of which is tied around the neck of the calf. In the deciduous forest with dried leaves littered on the ground, the movement of the calf remains audible on the one hand and the wooden piece of *Dengla* impedes its free movement on the other. *Acacia nilotica* and *Butea monosperma* wood is used for *Dengla*.

### **Weapon**

Tribals since the very beginning had resided in dense forests and had undergone the necessity of protecting themselves from various wild animals and also hunting them using various weapons. The necessity of weapons has declined. They have also played a role in warfare in historical times. Most households of tribals today do have weapons as ornamental purposes only. The bow and arrows are the chief weapons identified with the

*Bhil* tribe. The bow consists of a longitudinally split half of a long strip of bamboo culms with two grooves carved at either ends. Another long strip of bamboo with the aid of strings is tied to the carved bow and thus held in tension. A simple string comprising of fibres from plant materials may also be used without aid of a bamboo (Fig. 7). The arrows are also made of slender culms of usually young bamboo with wooden or metal tips varying with the purpose. The tips when of metal may be of different shapes. At the base of arrow, feathers of birds like kites and vultures are fixed chiefly for maintaining balance (Fig. 8). Next to the arrows, the axe besides serving other purposes also serves as a weapon at times for instance in mutual conflicts. Then comes the *Lathi*. In the past lances and the *Dhariya* were the other chief weapons. The handle of these, though varying in length are usually of bamboo only. The tips and blades are of metal generally procured in weekly markets, which the *Gadoliya lohars* also visit, who fashion these iron parts.

### **Musical instruments**

Songs and music add to tribal life. They possess a wide variety of musical instruments, chiefly made of wood from the forest trees. Some of which are common in almost every household of the tribal territory in India, while some are restricted to particular regions for example Parvi, Thalison, Gangi and Tarpi (the latter two employing dried hollowed fruits of *Lagenaria*) found in Rajsamand. The flute is the proud possession of almost every tribal child, while an instrument like the *Dhol* has a great significance in the social life and occasions. A brief description giving emphasis on the plant ingredients employed in the construction and working of 12 musical instruments has been enumerated.

#### *Pungi/Pipiya/Punpi*

The leaves of certain plants are folded (sometimes keeping a wooden chip in between) held between the lips and blown like a whistle. The leaves of *Butea monosperma*, *Casearia tomentosa*, *Carissa congesta*, *Cassia tora*, *Derris indica*, *Ficus benghalensis*, *Ficus racemosa*, *Ficus religiosa*, *Holoptelia integrifolia* are used in these whistles, which may be called one of the simplest musical instruments of tribals. The *pungis* are primarily designed by children.

#### *Dhol and Mandal*

It is a tribal instrument of music. It produces very powerful sound and is mainly used during community dances of *Bhil* and *Garasia* tribes. Both the instruments

are cylindrical constructions employing wood of a single block from the trunk of a tree. They have parchments of animal skin on both the ends held by strings. While the length of the *dhol* is smaller with a bigger diameter of the cylinder (Fig. 9), the *mandal* is played by the hands (Fig. 10). *Azadirachta indica*, *Boswellia serrata*, *Dalbergia sisso*, *Madhuca indica* and *Mangifera indica* are used in these instruments. The stick of *dhol* is made from *Calotropis procera* or *Clerodendrum phlomides*. Now a days, instead of wood, a metal sheet is used for the construction of a *dhol*. Both the instruments, when played, are hung from the neck of the player by a sling.

#### *Dholak*

*Dholak* (Fig. 11) is a miniature form of the earlier two musical instruments found nearly in every household. Its diameter at the middle is greater than that at the two opposite ends of the cylinder which may be carved out of a single wooden block or of several long strips joined length wise. The hide of a goat forms the parchment at both ends, the surface of which is beaten with hands. The wood of *Acacia nilotica*, *Azadirachta indica*, *Dalbergia sissoo* and *Mangifera indica* is used in this instrument.

#### *Flutes*

*Dendrocalamus strictus* is the most popular and perhaps the only material of which tribal flutes are made, which are of several sizes (with the varying length and diameter) along with the number of holes at the opposite end of mouth piece by which the sound produced by the blowing of air is regulated with the help of fingers.

#### *Sarangi*

This instrument is essentially made of a single wooden block of *Gmelina arborea* wood, whose belly is hollowed and covered by parchment comprising of animal skin. It is held by the narrow end. The instrument is played by moving a bow usually of bamboo with a stretched string of the hair of horse tail (Fig. 12).

#### *Ravanhthta*

This instrument also played by a bow over a stretched string is made of a shell of a coconut, to which a long piece of bamboo is fixed (Fig. 13).

#### *Tambura*

This instrument is also a popular one, carved out of a single wooden block with a slender neck broadening

into a large oval belly with strings running along its upper end (Figs 14,28). The instrument is played by plucking the string with ones fingers. On the upper side of the belly of this instrument, a raised 10.16-12.7 cm long piece of wood (called the bridge or *ghodi*) is fixed over, which pass the several strings. These strings are tightened with the help of wooden pegs called *Merna*. The wooden material used for the construction of the body are *Bombax ceiba*, *Boswellia serrata*, *Mangifera indica* and *Moringa oleifera*; *Dalbergia sissoo* and *Tectona grandis* for bridge; *Acacia leucophloea* and *Tectona grandis* for *merna* (pegs).

#### *Chhang*

This is a circular instrument with a 5.08-6.35 cm broad rim around its entire periphery. A goat hide forms the parchment of the instrument, which is played by thumping ones hands on the same. *Bauhinia racemosa* and *Tectona grandis* are used in the making of the rim of *Chhang*.

#### *Paizar*

The equivalent of the wooden *paizars* of tribal *Bhagats* is *Khartals* of stains in non tribal communities. A single *paizar* comprises of a 94 block of wood of a not a very great thickness narrowed at the centre with a hole for holding it. The *paizar* also has two slits at either end, in which circular metallic discs are fixed. Two such *paizars* are held in a hand and clapped together rhythmically, while singing devotional songs (Fig. 15). Wood of *Alianthus excelsa* and *Dalbergia sissoo* is used in the construction of *paizar*.

#### *Dheru/Dhak*

This instrument is like an over sized *damru* seen in Hindu temples or a miniature form of a *dholak*, but with both its ends gradually narrowing in a semi conical form to meet at the centre, whose diameter is nearly half as compared to that of either of the arms. The instrument is usually made of *Mangifera indica* wood (Figs 16,29).

#### *Algoza*

*Algoza* is an instrument of the Rajsmand tribals comprising of two flutes with varying number of holes, the mouth pieces of which are joined at one place, from which by holding between ones lips air is blown. Hollowed dry stem of *Calotropis procera* or bamboo are used for the pipes of the instrument, which may be tied by string or held at an angle (Fig. 30). Another instrument, called *Nagada* or *Kundi*, a hemispherical

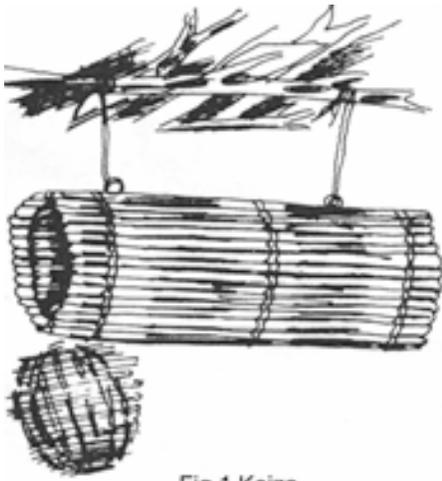


Fig.1 Koiza



Fig.2 Cradle



Fig.3 Biran



Fig.4 Rentiyo



Fig.5 Dheru



Fig.6 Rain hood



Fig.7 Bow

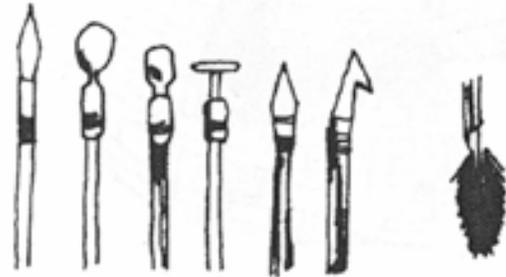


Fig.8 Arrows



Fig.9 Dhol

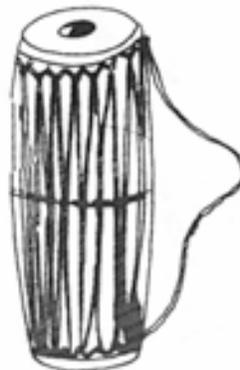


Fig.10 Maandal



Fig.11 Dholak

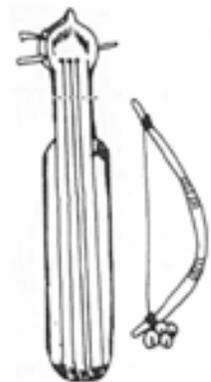


Fig.12 Sarangi

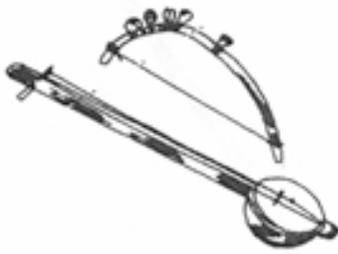


Fig.13 Ravanhattha

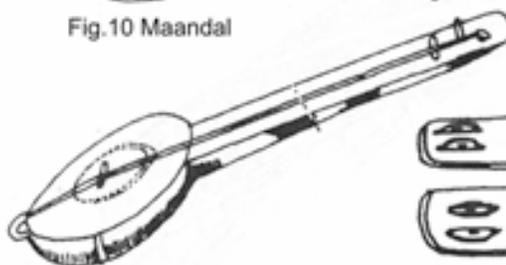


Fig.14 Tambura



Fig.15 Pajjar



Fig.16 Dhak

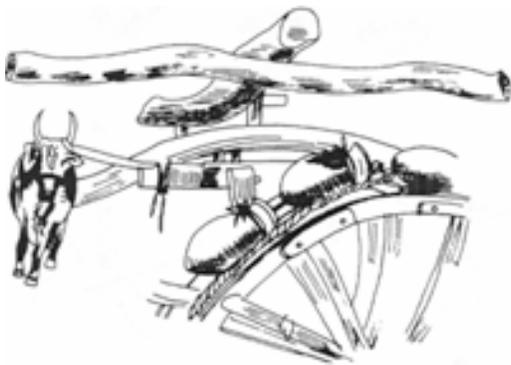


Fig. 17 Rehat



Fig. 18 Gophan



Fig. 19 Rakhavala (Scare Crows)



Fig. 20 Aduni

Fig. 21 Churning rod



Fig. 22 Winnowing fan

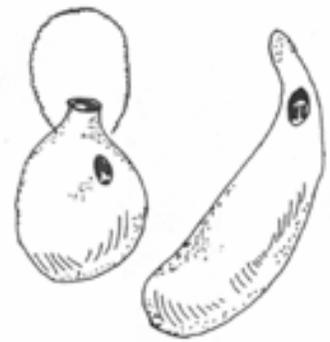


Fig. 23 Storage vessels

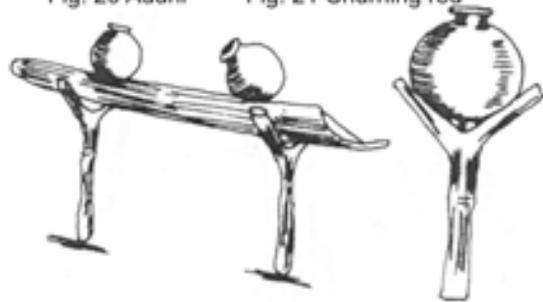


Fig. 24 Pitcher stands

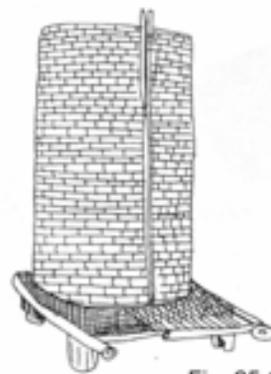


Fig. 25 Granaries

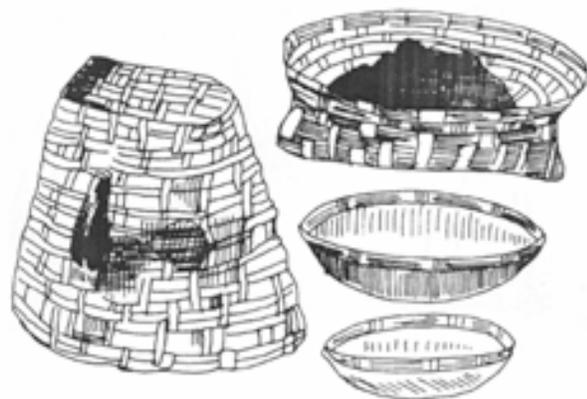


Fig. 26 Baskets

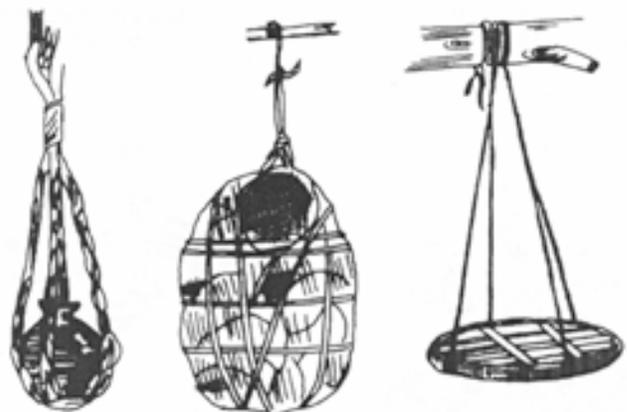


Fig. 27 Hanging baskets



Fig.28 Tambura of *Bombax ceiba*



Fig 29 Dhak of *Mangifera indica*



Fig.30 Algocha of *Dendrocalamus strictus*

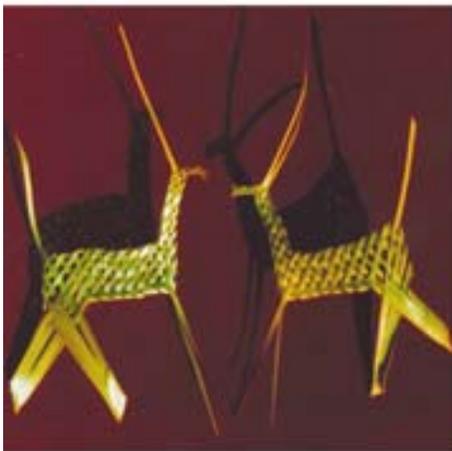


Fig.31 Deer of *Phoenix sylvestris*



Fig.32 Roof of *Dendrocalamus strictus*



Fig.33 Top inner view of hut



Fig.34 Inner side view of hut



Fig.35 Hut roof of grasses



Fig.36 Hut roof of grasses

structure made up of clay with animal hide parchment is struck by sticks.

### Ropes, cords and strings

Ropes, cords and strings come of a great use in tribal life, even is the construction and maintenance of the various structures and articles they own (Figs 31-36). These are derived from plants and employed in an unprocessed or processed forms. Stems of climbers, long narrow peelings/strings from the barks of trees and shrubs may be used in simple ways e.g. tying head loads. These may however be woven from fibres with or without elaborate processing and derived from some part of the plant species e.g. barks of trees, shrubs and lianas, strips of bamboo, leaves of *Phoenix dactylifera* and *Agave*, roots of *Butea monosperma* & bark of *Hibiscus cannabinus* and *Crotalaria juncea*. Various plant species, from which fibres are made along with their uses are enumerated (Table 1).

### Discussion

Items like huts, wells, constructions in the field, construction of *mandap* or bier are made by cooperative efforts of the village members. A whole household gets engaged, when constructions of granaries, cots, cradles, some agricultural implements are involved. Items like leaf utensils, storage vessels of fruits, brooms, baskets, fans are made by individuals in a tribal family. There are one or more specialists in the village, who design musical instruments on requests. Sometimes, tribals have to turn to non tribal artisans, who may be nomadic or sedentary (*Gadoliya Lohars*) for iron parts of their weapons, agricultural implements, etc., Potters for pitchers and pots, terracotta etc., stone workers for their mortars, memorial stones for the dead and effigies of gods and goddesses. Tribals are not entirely untouched with modernity. Traditional earthen lamps employing oil extracted from locally available plant seeds have been replaced by kerosene using glass bottle *chimneys* (lamps). One comes across glass bottles, polythene/plastic begs and canes and fertilizer sacs

servicing as storage bins. The presence of flour mills and oil expellers within village or vicinity has lightened the task of tribal women. Fishing nets of plant fibres employing fanciful natural colours are replaced by plastic nets. Some tribals possess cycles for transport and the role of the cart has been shadowed by the network of roads and the growing number of plying buses day by day. Traditional methods of irrigation and agriculture have been replaced by diesel pumps in wells and hand pumps, synthetic fertilizer in fields etc. The foregoing account gives a brief overview of the changed life of tribals in several regions much of which may not carry healthy currents in their lives. In an impoverished environment with agents of change tribals crafts and indigenous technology face disruption day by day.

### Acknowledgement

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