



Plant based technology among Adi tribe

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Abstract: The state of Arunachal Pradesh is one of the most diverse states in the country and is one the richest state in India in terms of material culture. The plant based technologies that they produced themselves are made out of natural resources available in their surroundings. Their products are simple but last for years and techniques for making such artifacts are indigenous in nature. They learn craftsmanship orally or just by observing from their parents and grandparents. The study documented many plant based artifacts of the Adi tribe that are made out of forest products especially bamboo, canes, and other plants. Further, the study also aimed at unearthing the kinds of possible threats that arise due to globalization which may affect traditional craftsmanship. The study finds out that most of these artifacts are not in use in their daily life anymore which is a matter of serious concern.

Keywords: Plant based Technology, Adi tribe, Indigenous, Artifacts, Material Culture

Introduction

The state of Arunachal Pradesh located in the Northeastern part of India is home to many tribes and its sub-groups. For generations, these tribes have had expertise in making a wide range of artifacts in its own unique styles and techniques traditionally. And every tribe of the state has excelled in the art of craftsmanship. From essential items used in the kitchen to making tools for hunting, they have a wide range of artifacts for every daily life activity.

Likewise, the *Adi* tribe has also developed various talents in making traditional artifacts for many generations. The community made artifacts like bamboo products, cane crafts, weaving, ornaments, and other kinds of crafts. They learn the art of making these artifacts either from their parents or grandparent during the course of their lifetime.

The menfolk in the community are well versed with artworks and they make handicrafts mostly out of cane and bamboo for domestic use. The community uses bamboo and canes for house and granary construction, household utensils, furniture, agricultural tools, hunting and fishing tools, and weapons like bows and arrows, etc. The womenfolk on the other hand possess appreciable expertise in handloom weaving and they weave a wide range of craft items like coats, skirts, bags, shawls, and traditional blankets. As the state of Arunachal Pradesh is abundant in cane and bamboo, the state is popular for cane and bamboo handicraft articles like a basket, cane belts, attractive smoking pipes, and even jewelery (Pandey et al., 2021).

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For the indigenous communities, these knowledge systems might be a casual thing that they practice in their day-to-day life. But these traditional knowledge systems are very significant as it has been developed by the elder generation after years of trials and experiences. In fact, the value and significance of such intangible cultural heritage of the worldwide tribal community are also recognized by the UNESCO and subsequently passed a convention in 2003 to protect intangible cultural heritage i.e., “the practices, representations, expressions, knowledge, skills—as well as the instruments, objects, artifacts and cultural spaces associated therewith—that communities and groups. The purpose of that convention is to create awareness about the importance of such indigenous products and the respect and mutual appreciation of the associated people and their culture.

Methodology

The present paper showcases the rich cultural heritage of the *Adi* tribe. Following the purposive sampling method, the present study was carried out in two villages of the Upper Siang district of Arunachal Pradesh viz. *Bomdo* and *Janbo* villages during the month of February and March 2021. The study is a part of the ongoing research project ‘*Documentation of Endangered Languages, Oral Narratives and Cultures of Lesser-Known Tribal Communities of Arunachal Pradesh*’ supported by the North Eastern Council (NEC), under the Centre for Endangered Languages (CFEL), Rajiv Gandhi University (RGU) and affiliated to Arunachal Institute of Tribal Studies (AITS), RGU.

Upper Siang District is one of the remotest districts of Arunachal Pradesh endowed with serene beauties of nature. It is occupying a geographical area of 6188 Sq. Km is composed of 92 villages. The Population of the district is 33, 363 as per the 2001 Census, where 18057 are male and 15306 females. *Yingkiong* is the district headquarter. The district is mountainous and enriched in rich natural resources and biodiversity. The area is characterized by deep gorges and fast-flowing streams and rivulets, which form the tributaries of the mighty Siang River. *Bomdo* and *Janbo* are medium size villages located in *Jengging* Circle of Upper Siang district, Arunachal Pradesh. The total population of *Bomdo* village is 444 of which 233 are males while 211 are females and the total population of *Janbo* village is 301 of which 147 are males while 154 are females as per Population Census 2011.

The said villages are inhabited by the *Adi* tribe which is one of the major tribes of the state. The information on artifacts was collected from these two villages. From the said villages, the respondents of various age groups and resources were selected. The field study was conducted for around a month. For the collection of the data, observations and a general survey was conducted. Comprehensive interviews with expert craftsman were also conducted with regards to plant based technology which are used for storage, drying,

fishing, hunting, storage, etc. The artifacts collected during the study have been tabulated accordingly. The images of the items are given at the end of the chapter. The item number in the table is similar to the image number.

Plant based technology

The *Adis* of Arunachal Pradesh has always been dependent on natural resources available abundantly in their immediate surroundings in order to sustain their livelihood. After centuries of being in close association with nature, they have developed for themselves the indigenous skill and technology to use these resources in various parts of their life support system (Singh et al., 2007). Apart from using plant resources for constructing houses and granaries, they also produce a number of plant based technologies. These traditional plant based technologies include handicrafts, fishing and hunting tools, storage items, utensils used in kitchen and foods system, etc. The *Adi* community crafted these valuable and low-cost traditional handicraft technologies for generations by using locally available plant biodiversity available in their forest.

The natural resources from which they produce these plant based technologies are mostly from different varieties of bamboo and canes. Other plants and woods are also used for this purpose. They use the natural resources in a sustainable and holistic way which involves careful management, control of the population, use small quantities, small surpluses, and minimum wastage. For example, bamboo is usually cut during a certain season. And they cut canes and threes in limited numbers to just meet their requirement.

These centuries tested technological skills are an integral part of the *Adi* community which are very significant. The plant based technology and its uses which are found in *Bomdo* and *Janbo* villages are described in Table 1, Table 2, and Table 3. It is important to note that the name of these artifacts may be pronounced differently in other *Adi* villages.

Item No.	Local Name	Uses	Plant Source
1.	<i>Duchak</i>	A bamboo mug is used for drinking water and wine. It is also used during the festival where rice paste is put inside it to perform rituals.	The kind of bamboo used for making this is called <i>hépo</i> . The strip tied around the mug is made of a kind of cane known as <i>Osong</i> .
2.	<i>Péko</i>	A bamboo bowl is used for keeping boiled vegetables during a meal. Now, people don't use this anymore, and instead, they use steel or	It is made of a kind of wild bamboo variety called <i>hépo</i> .

		plastic bowl available in the market.	
3.	<i>Ukung/Ékung</i>	Traditional dinner plates use for eating food made out of <i>hépo</i> bamboo variety. Now a day, people don't use this anymore, and instead, they use steel or plastic plate available in the market.	It is made out of <i>hépo</i> bamboo variety.
4.	<i>Turdung</i>	It is a kind of traditional jug. The important aspect of this jug is that rice beer is offered to the maternal uncle during the time of the festival and in return, the maternal uncle will put smoked rats in it and return it. The cap of the jug is called <i>Atud</i> .	It is made out of <i>hépo</i> variety of bamboo and the strip is made out of <i>osong</i> variety of cane.
5.	<i>Punchuk</i>	It is used to carry water when villagers go to the agricultural field or during the time of hunting. A similar kind of smaller size is used to keep vegetable seeds. It is still used by some residents in <i>Bomdo</i> and <i>Janbo</i> villages. However, the use of plastic bottles has been increasing in recent times.	It is made out of drying the pear-shaped bottle of gourd fruit. To protect it from breaking and to give it traditional look, cane usually <i>osong</i> is used to wrap it around. The strip is also made of <i>osong</i> .
6.	<i>Géri</i>	It is used for brewing millet wine. It is still used in many villages. It is also used to collect water from rivers during the olden days.	It is made out of drying the bottle of gourd fruit. To protect it from breaking and to give it traditional look, cane usually <i>osong</i> is used to wrap it around. The strip is also made of <i>osong</i> .
7.	<i>Ujuk</i>	It is used to pour water or traditional wine.	It is made out of drying the dipper gourd fruit.
8.	<i>Upun</i>	It is a traditional container for wine and water.	It is made out of drying the dipper gourd fruit. To protect it from breaking and to give it traditional look, cane usually <i>osong</i> is used to wrap it around. The strip is also made of <i>osong</i> .
9.	<i>Choket</i>	It is a waist bag worn by male members only. It is like a pouch tied to the waist of a man to carry things like salt, chili, tobacco, wild vegetables, etc. when they go to the jungle. During hunting, it is also used to carry rats, birds, etc. Women are not allowed to carry this bag.	It is made of cane known as <i>osong</i> .

10.	<i>Peh</i>	It is a Sieve used for separating finer particles of rice powder from thicker particles.	It is made of a wild bamboo variety known as <i>tagir</i> or <i>tarok</i> which is only found in deep jungles. <i>Osong</i> variety of cane is also used for making <i>peh</i> if <i>tagir</i> or <i>tarok</i> is not available.
11.	<i>Chuchak</i>	It is a basket to put paddy in during harvesting. It is also used for sowing paddy. It is also used to count amount of rice. One <i>chuchak</i> of is equal to one day wage. Both men and women can carry this.	It is made of cane known as <i>osong</i> or <i>takét</i> .
12.	<i>Perok/Perot</i>	It is a basket to keep millet or rice wine.	It is mostly made out of bamboo. Inside of the basket is covered with <i>korpuk/kompuk</i> which is the sheath of <i>hépo</i> variety of bamboo to intake the wine.
13.	<i>Lakkang/Talih</i>	It is a backpack or ruck-sag carried by men during hunting or when going to the forest or field. It is used to carry food, vegetables, etc.	It is made out of cane varieties such as <i>takét</i> and <i>osong</i> .
14.	<i>Ébér</i>	It is a basket used by womenfolk to carry firewood. The strap is called <i>Tayi</i> . Men rarely carry this basket. The back of this basket is usually made open tied with a loose strap. This loose opening of <i>ébér</i> is known as <i>barson</i> . This is to give more space for the firewood inside the basket.	It is made of <i>osong</i> variety of cane.
15.	<i>Naréng/Narang</i>	It is a basket to carry or to keep paddy and rice. The strap is called <i>tayi</i> . A small strap above this basket is called <i>rapon</i> which is used to tie stuffs when stuffs are more than its capacity.	It is also made of canes such as <i>osong</i> and <i>takét</i> .
16.	<i>Laiyéng</i>	It is a support that is put in the back of women when they carry baskets like <i>Naréng</i> or <i>Ébér</i> . It is worn by womenfolk only. It is usually worn to avoid back pain.	It is made of <i>osong</i> or bamboo.
17.	<i>Rabu</i>	It is a basket used to carry wild vegetables. It is used only by womenfolk. The design of this basket is similar to <i>Ehber</i> but this has no loose opening in the back of it and it cannot be used for collecting firewood. The strap is called <i>Tayi</i> .	It is made from a cane variety known as <i>Ramang</i> . This variety of cane is also called <i>Tare</i> . The leaves of this variety are also used for roofing traditional houses. It can also be made of <i>osong</i> or <i>takét</i> variety of cane.

18.	<i>Oppoh/Éppoh</i>	It is a winnowing basket or fan used as a winnowing tray for cleaning the rice and for separating the shaft from grain. It is parabolic in shape and one end is raised and narrow while the other end is flat and broad. The technique used is the simple twill method.	It is made of a wild bamboo variety called <i>hépo</i> . Cane varieties such as <i>osong</i> or <i>takét</i> is used to tie the edges and to give design.
19.	<i>Uchchung/Chume</i>	It is a kind of bowl to measure rice.	It is made of cane known as <i>osong</i> .
20.	<i>Lanchak</i>	It is a small basket used only by womenfolk to carry a machete, agricultural tools, tobacco, etc. It has a square bottom with a round mouth. The womenfolk tie this basket on their waist while going to the forest or paddy field. It is also used for carrying fish during fishing.	It is also made of <i>osong</i> .
21.	<i>Aapeh</i>	It is a basket to dry meat. Meat is called <i>domé</i> .	It is made of either <i>osong</i> or <i>hépo</i> .
22.	<i>Hiléng/Míngéh</i>	It is a basket to dry Millet traditionally called <i>tami</i> or <i>Mirung</i> .	It is made of <i>hépo</i> and cane variety.
23.	<i>Upuh</i>	It is a flat material to dry paddy. It is also used to dry cooked rice for making rice beer.	It is made of cane called <i>takat</i> . <i>Takat</i> is larger than the <i>osong</i> variety of cane.
24.	<i>Pítír</i>	It is a traditional chicken coop. The hen is kept here with her chicks when they are small. It has a big base with a small flat shape at the top. It has also one door to enter and exit.	It is made of bamboo.
25.	<i>Píki/Pírí</i>	It is a basket to keep hen for hatching eggs.	It is also made of bamboo.
26.	<i>Kupyak/Kumpek</i>	It is a traditional carpet.	It is made of dry banana sheaths.
27.	<i>Ébong</i>	It is a traditional umbrella. <i>Ébong</i> is first dried for long period. They last for a longer period may be more than 5 years if made carefully. This is especially for protection from sun and rain used during wet cultivation. It is worn on the backside.	It is made of <i>hépo</i> or <i>osong</i> . To prevent it from water leakage, dry palm leaf (used for roofing traditional houses) or Phyrnium leaf (locally known as <i>kokon</i>) and plastic sheets is put inside the <i>ébong</i> .
28.	<i>Laiyéng</i>	It is flat material attached with <i>ébong</i> to protect the lower part of the body from rain.	It is made of <i>osong</i> . To make it waterproof, dry palm leaves or Phyrnium leaf are put inside <i>laiyéng</i> .
29.	<i>Pékke/Pékkeng</i>	It is used to hang cloth and other materials.	It is made of bamboo or a branch of the tree.
30.	<i>Sappo</i>	It is a kind of plate used when chopping <i>tashét/tashat</i> (a variety of Sago Palm trees) which is	It is made from the skin of animal like deer.

		used as pig fodder.	
31.	<i>Dichchung/Dochchung</i>	It is a feeding plate for pigs.	It is made of <i>tashét</i> sheaths.
32.	<i>Dekkoh/Dokku</i>	It is a kind of plate to feed pigs.	It is made of a wood trunk. Usually, a jackfruit tree trunk is used for making this item.
33.	<i>Takék</i>	It is a string used to wrap food items.	It is made of <i>tarok</i> which is a wild variety of bamboo found in wild jungle.
34.	<i>Sappang/Sítak</i>	It is a piece of wood used to chop meats.	It is made of wood.
35.	<i>Éppén</i>	It is a traditional baby sling to carry the baby on the back. Firstly, a cloth is wrapped around the body and then this baby sling is put over the baby. Now a day it is rarely used in the lower Adi belt and cloth is used in place of it.	It is made of <i>osong</i> .
36.	<i>Paléng</i>	It is a kind of container used for giving water or salt to Mithun.	It is made of wood.
37.	<i>Ugur/Doggur</i>	It is a kind of plat for feeding Mithuns. It is bigger than <i>paléng</i> .	It is also made of wood.
38.	<i>Ík</i>	An agricultural tool for hand weeding and all types of weeding in the field. It is a sharpened strip of bamboo of 12-16 inches in length. It is folded in such a way that one end crosses over the other and makes a loop at the head. The two ends are to be gripped in hand. It is used by both men and women.	It is made of either bamboo or iron.

Hunting and fishing tools

Hunting and fishing are one of the most common occupation practices among the men of the *Adi* community. This practice has been followed down for many generations. This practice involves lots of experience which they learn from their parents or grandparents.

Hunting and fishing are usually practiced using tools that have been developed by themselves. These traditional tools are usually made of material available in their surroundings such as bamboo, canes, certain plant varieties, etc. Table 2 shows the list of tools used for hunting and fishing by the community.

Table 2: Hunting and Fishing Tools of the *Adis*

Item No.	Local Name	Item Description
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1.	<i>Hipeh/Ipeh</i>	It is a bow used for hunting birds and animals. It is made of bamboo. The thread is made of cane. Now a day, it is hardly used as most people opt for a modern gun over <i>hipeh</i> .
2.	<i>Yomo/Yogmo</i>	It is an arrow used to kill big animals like deer. The arrowhead is made of metal that contains poison. The traditionally made poison put in <i>yomo</i> is known as <i>omo</i> . The shaft is made of bamboo. Fletching is made of chicken feathers. When the prey is hit by <i>yomo</i> , they run away but after some time they die slowly. The hunter then traced the prey by looking at the footprint or blood on the ground. When they found their prey, they cut out a huge chunk of meat from the part where the arrow is hit. It is to make sure that the poison is not consumed by anyone in the family. Now a day, they rarely make <i>yomo</i> .
3.	<i>Pureh/Pudeh</i>	It is also an arrow that is used to kill birds, squirrels, rats, etc. It does not contain poison and metal heads. They made this arrow with bamboo.
4.	<i>Gabbung</i>	It is a sheath to keep arrows. It is made of bamboo called <i>édé</i> or <i>éré</i> . The strap is called <i>aangé</i> or <i>aan</i> usually made of <i>osong</i> .
5.	<i>Éshot/Éshét</i>	It is a traditional fish trap. The body of the trap is made out of plastic cement bag thread. The handle is made of <i>osong</i> and <i>édé</i> or <i>éré</i> .
6.	<i>Ékku</i>	It is a piece of traditional equipment for trapping rats. It is made of bamboo.
7.	<i>Ponggit</i>	It is a traditional trap to catch birds. It is made of <i>osong</i> variety of cane. The bigger one is used to catch Jungle Fowl traditionally called <i>Pirik</i> or <i>Posun ponggit</i> . <i>Pirik</i> and <i>Posun</i> are two types of Jungle Fowl found in the Upper Siang district. The smaller one is used to catch smaller terrestrial birds and is popularly known as <i>Tangku Ponggit</i> . <i>Tangku</i> refers to terrestrial birds. Terrestrial are types of birds are originally found on the ground.
8.	<i>Kitak/Petang</i>	It is a kind of catapult. It is a forked stick with an elastic band fastened to the two prongs, used by men or children for shooting small stones to hunt birds or squirrels. A small bag made of plastic thread called <i>nyogon</i> is used to carry small stones during hunting. Stone is called <i>iling</i> .

Other essential tools

Apart from the above tools and handicrafts, the people of the *Adi* community also have other tools which they use in a daily basis. These tools are very significantly used in daily activities.

Item No.	Local Name	Item Description
1.	<i>Yochik</i>	It is a traditional machete made of iron. It is one-sided sharpened. The handle of the machete is called <i>yoglé</i> which is made of dried bamboo roots. The round-shaped iron on the handle is called <i>tagé</i> which protect it from breaking.

2.	<i>Chobuk</i>	It is a traditional sheath or cover for a machete. It is also made of <i>osong</i> . The strap is called <i>aangé</i> or <i>aan</i> .
3.	<i>Chipit/Chikdo</i>	It is a traditional knife. The handle of the knife is called <i>yoglé</i> which is made of dried bamboo roots. The round-shaped iron on the handle is called <i>tagé</i> which protects it from breaking.

Conclusions

The present study witnessed that the importance of traditional artifacts is diminishing day by day. In recent decades, rapid modernization and acculturation process developed in traditional livelihood system of tribal community has practically endangered their age-old biocultural heritage and traditional skills, knowledge and technology in alarming proportion (Singh et al., 2007). The survey conducted has found that so many artifacts of the *Adi* community are not in use anymore. It might not be incorrect to say that this may lead to the loss of traditional knowledge associated with making these artifacts. The traditional artifacts are now being replaced by modern items made of iron, steel, and plastics which are commonly available in nearby markets. The kitchen utensils are being replaced by modern appliances made of plastic and steels, hunting and fishing tools being replaced by modern guns and fishing nets and traditional ways of weaving are being replaced by readymade clothes available in modern markets. This is a matter of serious concern as this might result in losing the knowledge system associated with these artifacts that have been passed down from generations. Therefore, there is a need to identify this kind of heritage and protect them, especially in an era of globalization.

In order to sustain this traditional knowledge system or traditional plant technology, the government, NGO's and community organisations can bring upon some integrated and holistic approaches such as entrepreneurship development, ecotourism, and economic empowerment to the concerned indigenous community. This will not only help the community in protecting their age-old knowledge system but it will also help them economically. In fact, these plant based technology of the community can be alternative innovative, and sustainable solutions for plastic and metal products that we used in day-to-day life. It is not too late to take proper initiative in this regard as there are still many people who are experts in making traditional artifacts among the *Adi* community.

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Table 1 photographs: Plant Based Technology





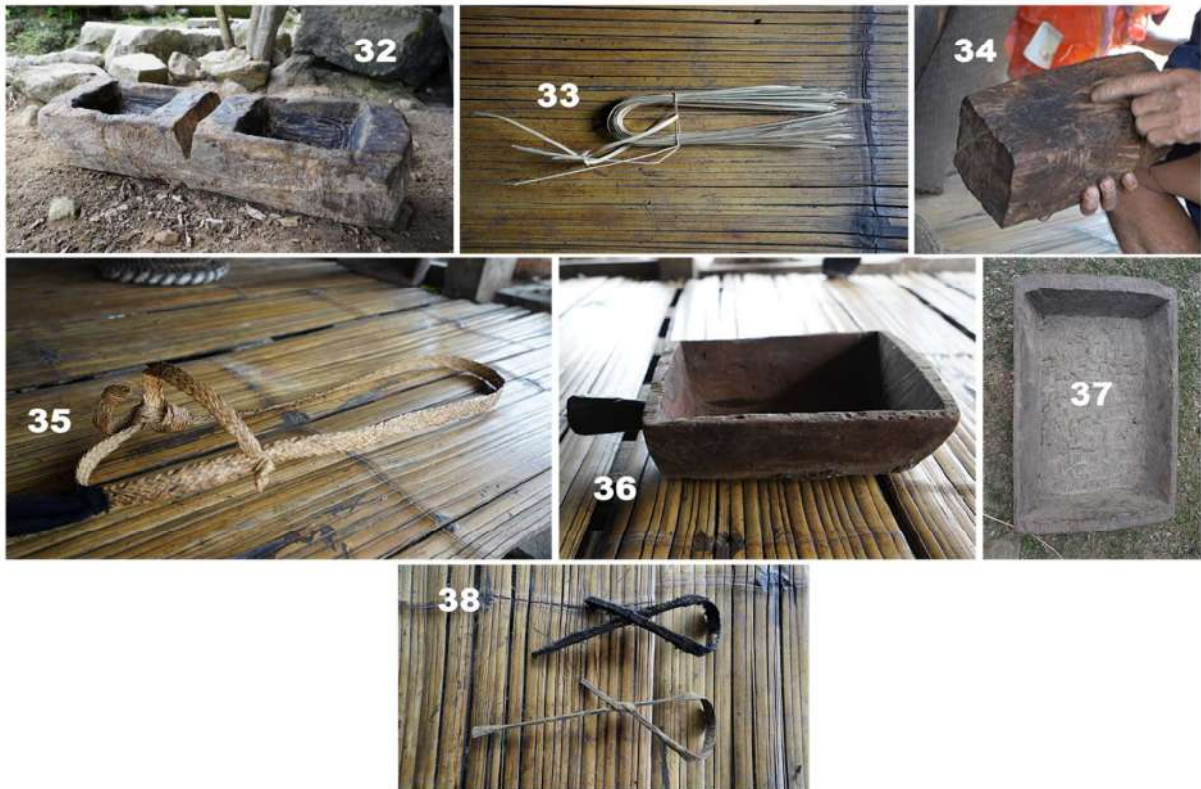
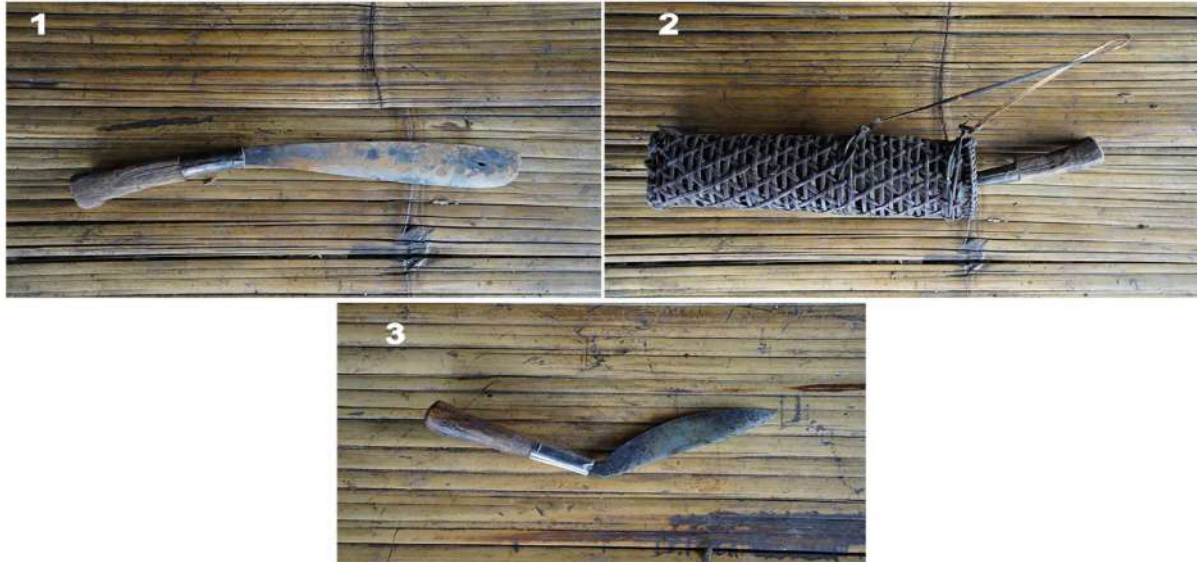


Table 2 photographs: Hunting and fishing tools



Table 3 photographs: Other essential tools**References:**

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