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DOCUMENTING THE RELIANCE ON FOREST AND ITS PRODUCTS BY NISHIS IN AND AROUND ITANAGAR WILDLIFE SANCTUARY, ARUNACHAL PRADESH, NORTHEAST INDIA

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Introduction

The Nishi are one of the major tribes inhabiting Arunachal Pradesh. Arunachal Pradesh is located in the northeast of India and is known for its rich biological and cultural diversity and is recognized as one of the 25 “biodiversity hotspots” of the world (Myers, 1988). The State has a forest cover of about 68,045 km² (Anon, 2001a; Singh, 1995) and is also home to about 26 ethnic human communities with distinctive cultures and rich traditions (Anon, 2002). Among them, the Nishis are considered to be one of the dominant communities and practice slash-and-burn cultivation, which is popularly called jhum, or shifting cultivation. Due to the mountainous terrain and lack of sufficient suitable land for irrigation-based cultivation, this community is almost entirely dependent on slash-and-burn cultivation. Shifting cultivation usually involves cutting of secondary bamboo forests (Ramakrishnan, 1992; Raman *et al.*, 1998). Since old growth or primary forest is less extensively available and is more difficult to clear, they are not cultivated frequently. The tribe as a whole is fond of hunting and fishing. Nishis practice polygamy and the length of the hut gives an indication of the number of wives a Nishi man has. The village is a cluster of huts made of bamboo, built on stilts and habitually situated in the valley. Examples of their hunting skills are proudly displayed at the entrance of each hut. The skull of a boar is generally kept among the trophies. At some houses, monkey skulls are usually hung near the door to keep evil spirits away (Shukla, 1965). Women are involved in farming and do not go into the forest as much as men. Nishis speak their own language, which has no script; English is understood. It is believed that God wrote the script

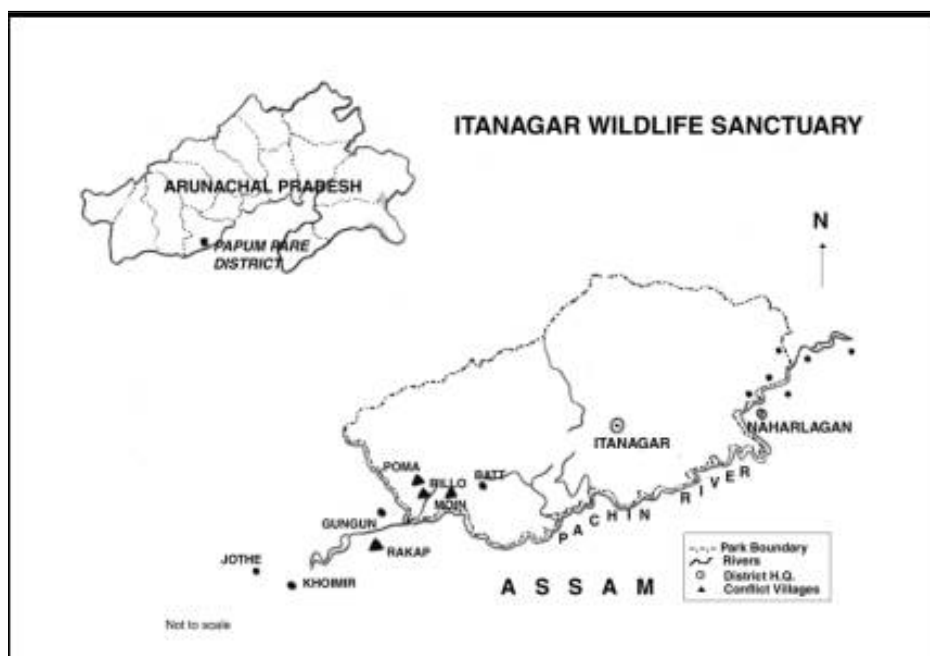
of the language of Nishis on the back of a mithun, which was eaten up by the people, so there is no written form of the Nishi language. Overall, the food, shelter and other needs of this community are met from the forest. One can notice the social, economic, cultural and even linguistic association of the forest and its products in the lives of Nishis that evolved over a period of time. The conservation of forest or wildlife or mitigating measures for Nishi-wildlife conflicts have to take these aspects into consideration. It was what motivated us to undertake a survey of the dependency on the forest and its products by Nishis in villages near Itanagar Wildlife Sanctuary in Arunachal Pradesh in northeast India.

Survey sites

The study site and the villages fall in Papum Pare district of Arunachal Pradesh. It is located between latitude 26°55' and 28°40' N and between longitude 92°40' and 94°21' E. The district headquarters is in Yupia, which is about 20 km from Itanagar. The district is approximately 3,462 km² in area with 274 villages and 2 towns. The district is divided into two administrative subdivisions – Sagalee and Itanagar Capital Complex. There are nine administrative circles- Sagalee, Mengio, Toru, Laiporiang, Kimin, Balijan, Doimukh, Itanagar and Naharlagun.

Itanagar Wildlife Sanctuary

Itanagar Wildlife Sanctuary is located in the vicinity of Itanagar, the capital city of Arunachal Pradesh, in Papum-pare district (Fig. 1) and covers an area of 140.30 km². It was established in 1978 (Anon, 2000) and is a notable biodiversity area. The region

Fig 1: Map of Itanagar Wildlife Sanctuary, Arunachal Pradesh**Table 1: Scientific names of species reported**

S.no	Taxa	Local name	Scientific name
1	Mammals:	Assamese macaque	<i>Macaca assemensis</i>
2		Barking deer	<i>Muntiacus muntjak</i>
3		Capped langur	<i>Trachypithecus pileatus</i>
4		Clouded leopard	<i>Neofelis nebulosa</i>
5		Dhole	<i>Cuon alpinus</i>
6		Elephant	<i>Elephas maximus</i>
7		Gaur	<i>Bos gaurus gaurus</i>
8		Himalayan black bear	<i>Selenarctos thibetanus</i>
9		Indian Porcupine	<i>Hystrix indica</i>
10		Jackal	<i>Canis aureus</i>
11		Jungle cat	<i>Felis chaus</i>
12		Leopard	<i>Panthera pardus</i>
13		Mongoose	<i>Herpestes spp.</i>
14		Mithun	<i>Bos gaurus frontalis</i>
15		Rhesus macaque	<i>Macaca mulatta</i>),
16		Stump tailed macaque	<i>Macaca arctoides</i>
17		Sambar	<i>Cervus unicolor</i>
18		Tiger	<i>Panthera tigris</i>
19		Wild boar	<i>Sus scrofa</i>
1	Birds	Indian hornbill	<i>Buceros bicornis</i>
2		Racket-tailed drongo	<i>Dicrurus paradiseus</i>
3		Wreathed hornbill	<i>Aceros undulates</i>

is mostly hilly (precipitous hillsides are the common feature of this area) and the average altitude of the terrain is 1,000 m above sea level. The terrain occupied by the forest gently slopes southwards and is highly rugged with mountainous ranges. Geologically, the forest area is prone to landslides during the summer months and is quite unstable. The soil on the hills is moderately deep, moist, fertile and loamy, the upper layer of which is stained with humus. The soil is very loose and heavily eroded.

The major forest types in this region are North Bank Tropical Evergreen (Nahor- Jutuli), Tropical Semi Evergreen and secondary forests. At places, the evergreen and semi evergreen forests merge with one another and cannot be described separately (Kaul & Hariharan, 1987). The region has a number of mammalian fauna. Notable among them are sambar, barking deer, wild boar, elephant, tiger, leopard, clouded leopard, jackal, dhole, Assamese macaque, rhesus macaque, capped langur and stump-tailed macaque.

Survey villages

Six villages located within and around Itanagar WLS, viz. Poma, Rillo, Jothe, Rakap, Moin and Khoimir, were the focus villages for the survey. The villages are around 10-15 km from Itanagar and can be approached by road. Most of the villages are small, with an average of 30-35 families, each with about 11 members, including children. Poma village has a Forest Range Office, a check post, an inspection bungalow, a middle school and a primary health center. Jothe and Moin have a primary and a residential school respectively. All the villages have water and electricity supply.

Methods

The surveys were carried out by visiting villages and obtaining information through questionnaires and direct observations.

Survey through village visit

The initial procedure of this approach was to establish the degree of dependency on the forest and its resources by different age and sex classes of village people. Information on their dependency

on forest products was collected from the villagers based on their visits to the forest per day, time spent and the status of human-animal conflict there. It was established that men spend more time in the forest and the survey was planned to interview two individuals of each age class (old and experienced persons, middle aged and individuals from the age class in which they start going to the forest) from each village.

Results

Reasons for visiting forests

A number of reasons were identified for a Nishi to visit the forest: i) in search of mithun; ii) to collect bamboo; iii) for jhumming; iv) for collection of vegetables; and v) to hunt animals. Sixty-three percent of the villagers visited the forest to look for mithun, 37% for collection of wood and bamboo, to jhum and to collect other forest products. With reference to specific reasons for visiting the forest, a majority (78%) went to the forest for hunting. Only a few (11%) did not go to the forest, the reason being that there were no animals in the forest. About 11% of the interviewed persons went to the forest to observe animals. Time spent in the forest varied and depended on the purpose of the visit. It ranged anywhere from a few hours (39%) to one whole day (11%) to a few days (50%); sometimes they spent many days in the forest until they found their mithun. Men usually visited the forests more often than women, to collect forest products. That the majority of the villagers, being hunters, spent a reasonable amount of time in the forest reflects the fact of heavy exploitation of forest and wildlife.

Status of human-animal conflict

Jackals represented 26% of the replies from people regarding the animals visiting their settlement. Other animals such as dhole, leopard, tiger and Himalayan black bear attacked mithun and other domestic animals. Elephant visits occurred once in a year, mainly for paddy. Jackals visited looking for chicken (57%), lambs and piglets. Villagers also reported that jackals raided their maize fields. Elephants caused more damage and the economic loss was about Rs. 5000-6000 (approx. US\$ 100-170). No human casualties due to wildlife have

occurred so far. With reference to the animal visits near human habitations during a particular season, 52% of the villagers who were interviewed felt that there was no seasonal difference in sighting animals. But 26% felt that more animals were sighted during the winter season, whereas the rest of the villagers did not have any opinion. Sightings of more animals during the winter season were attributed to the flowering and fruiting of some of the wild and cultivated species around the settlement. The conflict status does create pressure on the economy and food supply and the villagers retaliate by killing the animals.

Hunting

Hunting is a tradition among the Nishis and almost all men hunt regularly. Most of them possess guns. Traditional animal trapping/capturing methods are also used. Most of them have a set of bows and arrows in their houses. Hunting is both an individual as well as a group undertaking. The forest in its entirety belongs to the village as a whole. Thus, any person is free to hunt in any part of the forest that he likes; but he is forbidden to disturb the traps already laid by others (Shukla, 1965). Nishis, after jhum, enjoy a great deal of relaxation by hunting, tracking and stalking wild game. They wait near salt licks and near crop fields for animals. Bows, arrows, spears, self-designed mechanical traps and guns are used for trapping and killing animals. The young boys from Nishi villages frequently carried catapults, which seemed to be their favorite toy. The foundation to become skillful hunters is laid right from childhood. The entire tradition appears to focus on hunting and herbivore mammals, particularly the prey species, appeared to be on the losing end.

Forest products used

Nishis use a number of products derived from wildlife for different purposes including ornamental, medicinal, consumable and commercial. Skulls, horns and jaws of various wildlife species were displayed on the entrance of most of the Nishi houses. Nishi men carry a long flat knife called a "dao" hung around their shoulder. The knife is covered with flat bamboo strips and sometimes with the skin of wild animals, specifically of capped langur and Himalayan black bear, used as the

shoulder belt. The village headmen are called Gaon bhurrahs and they wear special headgear decorated with the beak of a hornbill and a feather is attached to the unique cane cap. There are also a few semi-precious stones embedded in their headgear.

The headgear also has other animal parts like the tail of a small mammal with light and dark orange stripes (a squirrel species). One headgear also had part of a racket-tailed drongo at the back of the cane cap. Mithun horns are generally kept in the houses, although some are displayed at the entrance of the huts. Mithun horns were used as containers to keep small things (coins, tooth brush and tablets) and were hung on the walls. Deer and mithun hides were used as mats on the floor during winters. Animals are hunted for supplementary food and for curing different ailments. Primates are killed more often, followed by deer. Monkeys (both macaques and langurs) are hunted for their skin and meat. Deer are killed for the skin, horns and meat; bears for the gall bladder, skin, claws, fur and meat; and tigers and leopards for their skin, claws, teeth and meat. Wild boar is mainly hunted for meat. Solanki *et al.* (in press) found that Nishis from 20 villages hunted 11 species of mammals.

There are some medicines derived from the animals. Tiger and leopard bones are used to treat rheumatism. Animal hides are used for ritual purposes and jaws with teeth are used to decorate the huts. Bear gall bladder is believed to cure dysentery, jaundice and intestinal troubles. Barking deer antler is believed to cure impotence, hypertension and arthritis. Primate meat is used for the treatment of malaria.

Nishis also take part in other forms of resource gathering: some men work for the forest department as casual workers, some for the Public Works Department in road construction near their villages. Women from the villages sell bamboo, wood and vegetables in the nearby markets.

Table 2: List of animal products and their usage by Nishi

S. No	Species	Body part	Ornamental	Medicinal	Edible	Commercial
1	Barking deer	Skin, horn	Mat, display		Meat	
2	Wild goat	Skin, horn	Bag, display		Meat	
3.	Hornbill	Beak, feather	Head Gear			
4.	Capped Langur	Skull	Display		Meat	
5.	Himalayan Black Bear	Skin	Shoulder belt	Bile		Sale
6.	Greater racket tailed Drango		Head gear			
7.	Mithun	Horns, skin	Display, mat		Meat	Sale

Methods of hunting and trapping wildlife

Some of the indigenous methods of trapping animals are still in use (Figures 2 & 3). During the survey two traps (noose traps) set up on a tree branch to catch canopy-dwelling animals were encountered. The trapping method is to tie the bait to the branch with a string (reed) and a loop is made around the bait. The bait, in this case a nut, is positioned within the loop in such a way that the animal is forced to walk through the loop to get the nut. The end of the string is tied to a heavy stone (around 3 kg weight). As the animal tries to feed on the nut, the loop tightens and locks the animal in the loop. The animal gets trapped and the heavy stone connected to the loop does not allow the animal to escape. The trapped animal is strangled and dies.

A trap (locally called pan) to capture/kill tigers was demonstrated during the survey by the villagers. The trap works on the principle of lever release. The trap is made up of a cane string tied on the trail at a height 6 inches above the ground. The string is then tied to a sharp bamboo spear, which is hidden in the bushes on one side of the trail. The string is held tight so that a slight disturbance in the string will immediately release the bamboo stick. Any movement of the animal over this trail dislodges and releases the bamboo spear hidden in the bushes and kills the animal. The bamboo used in this trap is a special one and is usually grown in higher regions. This particular bamboo

species is also believed to cause an itching sensation and infection in the wound, so that it will not heal quickly. There have been instances when this trap has killed even humans. In one such accident, the person who laid the trap had to give 15 mithuns as compensation to the victim's family. Now a decision has been made by the gaon burrahs not to use this type of trap any more and since then they are no longer used. Earlier, when these traps were still being used, the chance of humans getting injured/ killed was high. According to the villagers, dholes can also be killed using this trap. Currently, villagers carry guns (SBBL) when they go to the forests to protect themselves from wild animals and also for shooting animals and birds.

Conclusion

The dependency of Nishis on the forest and its products is well known (Solanki *et al.*, in press), but it has not been well documented. Nishis have been hunting animals for many years. This is a major activity for them which they enjoy and are proud of their hunting skills. There is an urgent need for assessing their dependency on the forest products and the effects of their hunting and trapping of wildlife species. This information will help to determine the status of the forest and wildlife found in the region and also help to develop conservation strategies. Other than shifting cultivation and irrigation-based agriculture, people in the area do not have any other source of income. During the survey many people expressed the need

Figure 2: Trap for capturing small canopy dwelling animals

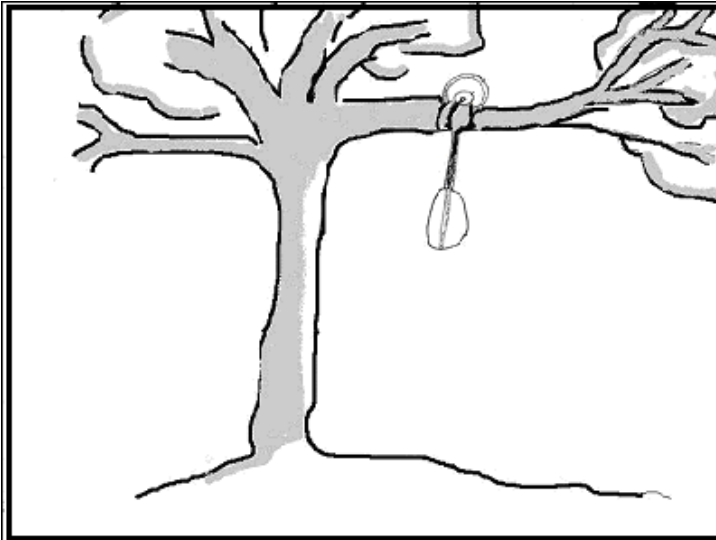
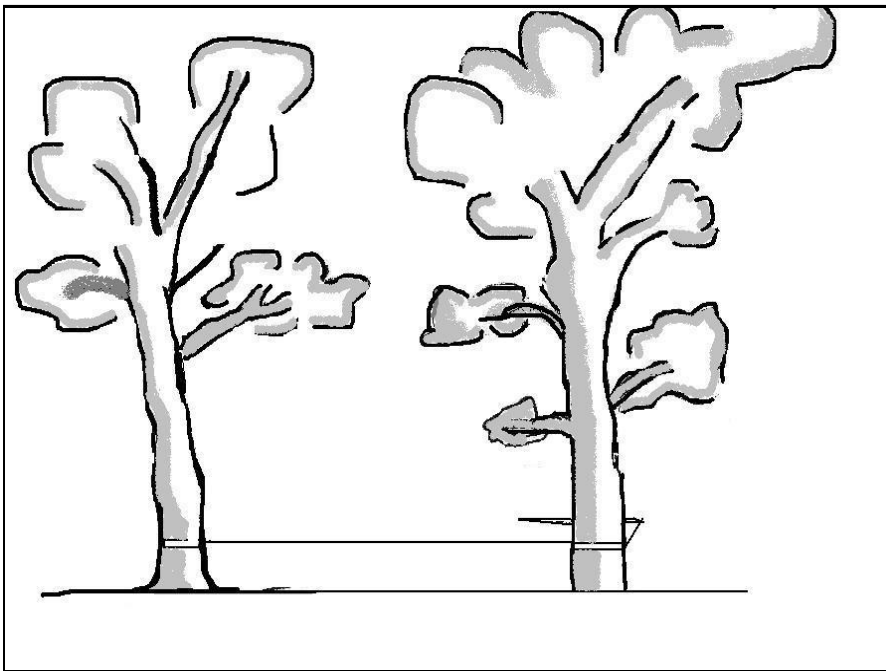


Figure 3: Trap used to capture/kill tigers and other trespassers (as demonstrated to the Field Investigator)



for alternative livelihoods. Some of the suggestions they offered were pig farms, poultry farms and fisheries, which will decrease the hunting and trapping of wildlife. Such alternative livelihoods have never been tried in the area and it would be worth attempting in at least one village on an experimental basis. The problems encountered can be rectified immediately as these villages are very close to the capital town. A handicraft cooperative society could be set up as an income-generating scheme, through which their dependency on forest and forest products would be reduced. Galle (skirt of woven fibre with designs typical to Nishis) weaving can be taken up as an activity for supplementary income. Products made of bamboo (grown sustainably) can be sold through co-operative societies run by the villagers.

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