

ETHNOZOOLOGY OF THE NYISHI TRIBE AND ITS IMPACT ON BIODIVERSITY IN ARUNACHAL PRADESH, INDIA

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Abstract

The paper deals with the ethnozoology of Nyishi tribe of Arunachal Pradesh. There are 18 animal species including birds, reptiles, and the mammals, utilized by the Nyishi peoples as protein supplement in their diet, in preparation of traditional medicine and during different socio-cultural as well as magical religious occasions. The use values of all the animal categories were calculated. The highest total use value found in tiger was (0.37), followed by Himalayan black bear (0.32). Tiger and bear are found to have equal use value (0.20) in therapeutic activities of Nyishi tribe. Rate of disappearance in mammals was found to be highest, (426 animals per year). The ungulates and non-human primates are the highly affected categories among mammals occurring in the area. These cultural practices are linked to loss of biodiversity in the region.

Key words: Ethnozoology, Nyishi tribe, use value, use pattern, biodiversity.

Introduction

Ethnozoology is a discipline that deals with the animals and their uses through the indigenous system. Martin (1995) defines it as 'the local knowledge and use of animals'. The human activities out-strip all other in the complexity due to its variety of socio-cultural and religious behaviours in different human populations across the world (Gadgil, 1987). The relationship between the animals and man is known at the very outset of human civilization of the world. Indigenous and traditional people have unique cultures that are closely integrated with local natural environment. Indigenous communities know the diversity and ecology of the species that exist in their ecosystem. This knowledge

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varies significantly with gender, age, and status within the communities. Arunachal Pradesh is geographically the largest state that has large ethnic diversity, having 26 major tribes and 112 sub-tribes (Solanki, 2002), in the North-eastern region. Nyishi is the most populous tribe, the second largest tribal group of Arunachal Pradesh, which constitutes, more than 22% of the tribal population of the state (Census, 1991).

North-eastern region of India is one of the twenty-five biogeographically distinctive "hotspots" of the world, having rich biodiversity and rare and endemic flora and fauna (Myers et al., 2000). Biodiversity has many values, both material and non-material. Material values have both direct uses and ecosystem services. The direct use of biotic resources meets human needs for food, feed, fiber, shelter and medicine. The importance and value of ecosystem services in providing our life support system are increasingly being recognized. Wildlife provides significant amounts of calories for rural communities as well as essential protein and fats (Bennet et al., 2000, and Townsend, 2000) and is used by man for its subsistence in different parts of the world (Bigalke, 1973; Eltringham 1984; Bodmer; 1994; Cullen Jr. et al, 2000; Pattiselanno, 2002, 2003). Asia's wildlife including India is being sold on a massive scale through out the region for food, medicine and pet, and population of many species are declining fast or facing gradual local extinction.

The different ethnic groups in Arunachal Pradesh show diversity in uses of faunal component of natural ecosystem. The faunal use pattern by the indigenous peoples in Arunachal Pradesh is little known and documented. Few primitive studies on ethnozoology of tribes of North- eastern region including Arunachal Pradesh have been done (Borang, 1996; Harit, 2001, 2002; Solanki et al., 2004 a and b; Solanki and Chutia, 2004 and 2005; Chutia and Solanki, 2005). Present study deals with the use of animal and animal products as food item, in therapeutic and in different socio-cultural as well as magical religious activities of Nyishi tribe and its impact on biodiversity of Arunachal Pradesh.

Materials and Methods

Study on Ethnozoological information and loss of animal categories, and faunal diversity was undertaken in Nyishi dominated areas viz., Papum Pare, East Kameng, Lower Subansiri, Kurung Kumey districts of Arunachal Pradesh. The information about the number of villages inhabited by Nyishi tribe the approachability and other feasibility in the villages was collected from respective district headquarters. Out of the suitable villages, 10-15% villages were identified and surveyed for this study during 2002-2004. The information collected through the survey was extrapolated for entire Nyishi community. Out of the identified villages, 80% were purely rural in nature (not much

influenced by modern development) and rest 20% was of mixed type, semi-urban as well as urban.

The information about the animal categories and their use for various socio-cultural, magical religious and therapeutic activities by the Nyishi people were collected on through Questionnaire developed for this study and compiled for development of tables. Rate of disappearance of the animal categories per year was also calculated. Data on zootherapeutics were obtained through open-ended interviews carried out with informants, both male and female. These included local healers, herbalists, midwives and elders, farmers and other residents of the area, who were interviewed for :

- Their prior knowledge about remedial practices based on animal products,
- Use of animal products in their healing practices and
- Animals' categories prescribed for and how the medicines were administered.

The information were also collected about species being used in zotherapy, the type of raw materials used, and modes of preparation, celebration and administration of the folk-medicine, as well as the diseases for which the folk medicines are prescribed. Field work was guided by an emic approach because it was aimed to record people's utilitarian knowledge of faunal resources. This kind of approach of ethno-biologists records the native people's knowledge (Posey, 1996).

The different animal categories are used for different purposes on different occasion. The use-value of each animal was calculated on modifying the formula given by Phillips and Gentry (1993):

$UV = (\sum RM \times C)/N$; Where, UV=type of use value, RM=the total number of raw materials extracted from individual animals, C=the number of times which a particular animal has been cited, and N=the total number informants.

Results

There were 18 animal species including two bird species, two reptiles and fourteen mammalian species which were recorded to be used by the Nyishi tribe for the activities viz., therapeutic, socio-cultural, and religious one in present study. Use values of each animal species in the activities and the total use value (TUV) of the species is mentioned in the table 1. The body parts of different animal species utilized for different purpose by the Nyishi tribe are given in table 2. The larger cats namely *Panthera tigris*, and *P. pardas* and bears are primarily killed for bones to be used as traditional medicine skin, toes and teeth as ornamental items for decoration; and meat as protein supplement in their food. We found in the study that tiger, leopard, Himalayan black bear, slot

bear, primates, mithun and hornbills are the most variedly used animals. However, the total use value (TUV) of tiger, Himalayan black bear, hornbill and leopard was calculated at 0.37, 0.32, 0.24 and 0.23, respectively which indicates extensive use of the these animal categories (table 1). Some species with TUV, ranging from 0.20 - 0.22 were found to be important resources for cultural and religious activities. Non-human primates dominate this category of animals. Other species were found to have lower TUV but had its important place in some of the activities mentioned in the table.

Table 1 : Use value and total use value (TUV) of different animals

Sl. No.	Animal species	Medicinal value	Socio-Cultural use value	Religious use value	Total use value
1	Tiger	0.2	0.08	0.09	0.09
2	Leopard	0.9	0.08	0.06	0.06
3	Sloth bear	0.09	0.04	0.04	0.04
4	Himalayan black bear	0.2	0.06	0.06	0.06
5	Caped langur	0.06	0.08	0.06	0.06
6	Assamese macaque	0.06	0.08	0.06	0.06
7	Rhesus macaque	0.06	0.08	0.06	0.06
8	Barking deer	0.04	0.05	—	0.09
9	Mithun	0.07	0.06	0.06	0.19
10	Hornbill	0.1	0.1	0.04	0.24
11	Jungle Crow	0.05	—	—	0.05
12	Python	0.08	0.04	—	0.12
13	Porcupine	0.15	0.04	—	0.19
14	Chinese pangolin	0.06	0.03	—	0.09
15	Monitor lizard	0.04	0.05	—	0.09
16	Civet	0.04	0.06	—	0.10
17	Lutra	0.06	0.07	0.09	0.22
18	Wild boar	—	0.05	0.06	0.11

Source: Based on survey conducted by the investigators.

Table 3 indicates the average loss of animals and animal categories in ethnozoological practices. A total of 426 individual mammals of different categories are lost every year, that makes nearly 86% of total loss of species occurred in the area. Ungulates are most affected groups of mammals that include mithun – a semi-domesticated ungulate species. Among the wild ungulates, deer is the major group that is killed largely, which constitute 51% of total ungulates and 22% of total mammals.

Primates are the next targeted group among mammals; loss for this group is 134

Name of the animals	Body Parts				
	Food	Therapeutic	Ailments	Culture	Magical religious
Mithun	Meat	Gall bladder	Malaria, Typhoid and Dysentery	Meat and whole animal	Skull and horn
		Horn	Menstrual irregularity		
		Penis	Breast pain and lactation	Teeth and skin	Teeth, skin and hoof
Tiger and leopard	Meat	Meat and bone	Malaria, Rheumatic pain, pox and wound		
		Gall bladder	Malaria, typhoid and dysentery		
		Fat	Rheumatic pain		
Bear	Meat	Gall bladder	Malaria, typhoid and dysentery	Skin, teeth and claws	Teeth, skin and Claws
Non-human primate	Meat	Meat	Malaria, typhoid and delivery pain	Skin	Skull
		Gall bladder	Malaria, typhoid and dysentery	—	—
Hornbill	Meat	Meat and Fat	Malaria Rheumatic Pain, pox and wound	Beak	Feather
Wild boar	Meat	—	—	Teeth	Teeth
Barking deer	Meat	Meat and testis	Male impotency and growth of children	—	—
Chinese Pangolin	Meat	Exoskeleton	Wounds	Skin	—

Porcupine	Meat	Alimentary canal	Abdominal Pain	Sting	—
Monitor lizard	Meat	Meat	Body weakness, malaria and typhoid	Skin	—
Civet	Meat	Meat and fat	Body weakness and abdominal pain	Skin, taws and nail	—
Python	Meat	Meat and fat	Rheumatic pain	Skin	—

animals / year (27% of total loss). If mithun is not considered totally wild, then primates would acquire top most places in the list of animal categories killed by Nyishi tribe. Carnivores includes the lesser and larger, and insectivores animals are the third largest categories of animals that are killed by this tribal group (table1). Birds and reptiles are exterminated equally i.e.35 animals/year. Cartridge gun, Snare, bow and arrow and other mechanical traps are the main hunting tools used by Nyishi tribe to kill the animals recorded in this study. Cartridge gun is the modern tool used by all economically sound members of the tribe. It is more effective and has larger impact on loss of wild faunal resources because it is also lent to others.

Table 3: Loss of animals per year

Sl. No.	Animal categories	Loss of animal	% of loss
1.	Mammals	426	85.94
	Primate	134	26.9
	Bear	9	1.77
	Carnivores	41	8.6
	Insectivores	66	11.24
	Ungulates	187	37.43
2.	Birds	35	7
3.	Reptiles	36	7

Source: Based on survey and personal calculations.

Table 4 : Details of loss of animals and method of trapping / killing

Sl. No.	Animals	Average loss	% of loss	Methods of trapping
1	Tiger	3	0.6	
2	Leopard	4	0.8	Cartridge gun, snare, bow and arrow, mechanical trap
3	Sloth bear	3	0.6	Cartridge gun, snare, bow and arrow, mechanical trap
4	Himalayan black	5.8	1.17	Cartridge gun, snare, bow bear and arrow, mechanical trap
5	Civet	14.6	3	Cartridge gun, snare, bow and arrow, mechanical trap
6	Caped langure	10.5	2.1	Gun and mechanical trap
7	Assamese macaque	50	10	Cartridge gun
8	Rhesus macaque	73.5	14.8	Cartridge gun
9	barking deer	95.5	19.2	Cartridge gun
10	Mithun	65.5	13.1	Dao
11	Wild boar	25.5	5.13	Cartridge gun, snare, bow and arrow, mechanical trap
12	porcupine	35.5	7.14	Trapping by case, suicide rope and mechanical trap
13	Chinese pangolin	20.4	4.1	Trapping by case, suicide rope and mechanical trap
14	Monitor lizard	35.5	7.14	Trapping by case, gun snare and mechanical trap
15	Lutra	20	4	Cartridge gun
16	Jungle crow	20	4	Cartridge gun
17	Hornbill	14.5	3	Cartridge gun
18	Python	16.5	4.5	Cartridge gun and snare

Source: Based on field survey and personal calculations.

Discussion

Indigenous and traditional people have unique cultures that are closely integrated with local natural environment. These communities have a strong stake in the natural resources around them due to their dependence on varied resources to sustain their livelihood and culture. Their close relationship with the natural environment makes them well informed about the type of resources available, period of their availability, approach routes and other relevant details. The ethnic groups in North-eastern part of India including Arunachal Pradesh have been observing age old traditional customs in which use of wildlife and their products is very common (Pal, 1993; Borang, 1996; Datta, 2002; Solanki et al, 2002; Solanki et al., 2004 a and b). In order to meet some festivity large scale hunting of animals for food, magical religious and for therapeutic uses is done that leads to depletion of biological diversity of the region. Large-scale killing of animal is subjected to use value of the animal category (table 1). Mammals

are intensively killed, as the rate of loss is 86% of the total kill in a year. All the species reportedly killed are the scheduled species as per the Wildlife (Protection) Act, 1972. A study by TRAFFIC (1998) in East Asia indicated that the species and their parts have been illegally traded in and outside the countries, like China, though the driving forces behind the killing vary from region to region (Anon, 1998). Larger carnivores are illegally killed for skin, fur as trading material and bone and claws are used in making traditional Chinese medicine for rheumatic and other body pains (Jackson, 1978). The tiger and leopard are the topmost carnivorous animals, which play major role in ecological balance the natural ecosystem and maintenance of healthy genotype.

The hunting of non-human primates and the utilization pattern of endangered primates for food and medicine have posed serious threats for their survival in many of African and Asian countries as reported by Butynski and Koster (1994), Ammann *et al* (2000), Angelici *et al* (1999), Bailey *et al* (2002), Bennett (2002), Bowen and Pendry (1999), Bowman (2000), and Friedmann, (2003). Ellis (1999) has published a report of commercial trade of chimpanzees and Gorillas in Cameroon. The Flecheiso tribe of Amazon regularly uses the smoked meat of various monkeys as primary protein supplements (Scott Wallace, 2003). The primates are very much essential and important in seed ecology, which maintains regeneration of natural fruit plants, thus enrich genetic/generic and ecosystem diversity. The wildlife trade is illegally flourishing in various ways (second to the narcotics trade). Its earnings are estimated at US \$ 20 million annually (Hanfee, 1997). The trade includes every thing from small songbirds as pets to reptiles and large fur bearing mammals for skin and their meat to animal parts for medicinal use.

In the Nyishi community most of the folk medicines are administered in the form of liquid/syrup, powder or plasters, and massage oil. Malaria, abdominal pain and rheumatic pain and un-diagnostic fever are the frequent ailments in which preparation from gall bladder and fat are the most commonly used therapy. Usually gall bladder of primates is used in the form of extract and syrup and fat in the form of massage oil for the treatment of strains, bruises, insect bites, boils and rheumatism. Further research is required for conformity of the medicinal value of this traditional therapy, to encourage the use of herbal therapy and make the indigenous people aware about the available plant based therapeutic system. It would prove probably a more ecologically and socially sound development.

The indiscriminate use of animals and their parts as medicine is a world wide concern. The local trade of wild products to be used as medicine becomes a source of income. The therapeutic use of animals is also common in Arunachal Pradesh. Therapeutic use to treat diseases, decoration and some magical religious aspects

associated with their culture are prime patterns of use of these animals (Table 1). The instinct of killing animals, smaller or larger, in the Nyishi tribe is the main cause for getting the faunal components invisible from the forest of their areas. The unjustified policy of issuing fire arms particularly guns, air gun and cartridge gun, no policy on submitting account of cartridges used by the gun owner, use of explosives freely for killing and capturing fishes, poor publicity of conservation education programme and enforcement of laws and act are the cause for large scale disappearance of animals. The animals perform vital roles in the forest as predators, pollinator, and seed disperser disappearing; other species will also go along and make the forest system fragile. The cumulative impact of all the above aspects will lead the reserve forest and community forest towards "empty forest syndrome".

Suggestions

Instead of taking punitive measures against the practitioners of zotherapy or creating policies which force them to abandon their traditional customaries, we would suggest to examine this human-nature interaction within its cultural dimensions. People have been using animals in their culture since time immemorial. Suppression of tradition will not save them from extinction unless possible alternative is proposed. Traditional farming system for the species that are widely used in their socio-cultural and ethnic frame work would be a viable proposition where both traditional and scientific management techniques could be clubbed together.

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