

Role of indigenous knowledge system in conservation of forest resources—A case study of the *Aka* tribes of Arunachal Pradesh

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Indigenous knowledge is the basis for local level decision-making in agriculture, healthcare, food preparation, education, natural resource management, and a host of other activities in rural communities. Forest resource conservation is a global issue. Arunachal Pradesh inhabits about 26 major tribes and number of sub tribes. Forest is their main source of economy and livelihood. Tribes have evolved Indigenous knowledge system (IKS) that is vital in conservation of forest resources. An attempt has been made to analyze the role of IKS, beliefs and sacred groves of the *Aka* tribes in conservation of forest resources. The indigenous knowledge systems of conservation of plants, animals, sacred groves, etc. have been discussed. Primary data has been generated by conducting survey in 37 villages inhabited by *Aka* tribe.

Keywords: Forest conservation, Indigenous knowledge, Sacred groves, *Taboos*, *Aka* tribes

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Akas are a small tribal group inhabiting the sub-Himalayan part of India. The name, *Aka* has been given by the people of the plains of Assam and the British officials, which means a painted, that may be because of their custom of painting forehead, nose and chin¹. They are territorially divided into two sub-tribes namely *Hrusso* and *Korou*. Further, they are divided into a number of exogamous clans. They believe in *Nyezino* (*Nyezi* = sky and *No* = earth). They have a distinct feature of traditional dress, dialect, appearances, etc. They speak their own dialect, which is affiliated to Tibeto-Burman family of language. They belong to Mongoloid traits². The *Aka* area is located in between 27°0' N and 27°30' N latitudes and 92°35' E and 92°55' E longitudes (Fig.1). The territory is surrounded by the *Mijis* on the North, Sonitpur district of Assam on the South, the *Nyishis* on the East and the *Monpas* on the West. The altitude of the area varies from about 200–2,500 m above mean sea level. The area is traversed by the Kameng river system. Bichom (*Humtru*) and Tenga (*Hudgji*) river form the main tributaries of Kameng drainage system³. In all there are 37 *Aka* villages (Fig. 2). The population of the *Akas* increased from 3,531 (1991 census) to 5,027 in 2006 (Fig. 3). Marriage in the

society is a socially sanctioned institution. *Nyetchidow* is the major festival of the *Akas*. These people practice the traditional *jhum* or shifting cultivation.

The *Akas* have their own indigenous knowledge system useful in the conservation of forest resources. Numerous species of plants are not extracted from the forests. Similarly, some animals are neither killed nor eaten by these people. They spare the immature and pregnant animal in the forests. Small saplings of certain plants are not destroyed. Only required plant parts are collected from the nearby forests. As such, these people have developed an eco-friendly relation with the surrounding forest ecosystem. Conservation and management of plant and animal resources is not a new concept for the tribal people. Conservation of forest resources refers to the sustainable utilization of the plant and animal resources. The study deals with the documentation of vital indigenous methods of conservation of plant and animal resources. These include various faith and beliefs that are pertinent in protection of sacred groves, from which extraction of plant material is restricted or tabooed (Fig. 4). The festivals are linked to the forests. Traditionally, they practice an annual hunting ritual after worshipping the forest god. During such hunting, they spare pregnant as well as immature animals. The herbal practitioners

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belonging to the community do not promote over extraction of medicinal plants, fire and grazing⁴.

Forest and forest products have great impact on the culture and economy of the people and all the activities of the people revolve round the forests. Agriculture (*jhum* or shifting cultivation) and other associated activities like construction, implements, utensils, hunting, fishing and food-gathering have a direct link with their forests. Their diet includes various types of vegetables, fruits and nuts, hunted animals and materials from the forests. The social customs, beliefs, faiths tradition, etc. of the people reflect deep imprint of the nearby forests. Probably, it is the realization of their ancestors that they worship the forests as feeder (*Thou*) and rearer (*Gew*) to human beings⁵. The pattern of interaction with forest appears to be deterministic.

Methodology

In order to achieve authentic information, an extensive dialogue with the inhabitants of 37 *Aka* villages was conducted. The respondents comprised young and old, male & female. Interviews mainly aimed at generation of factual information about the Indigenous Knowledge Systems and assessing the role of sacred groves in the conservation of forest resources. The participatory observation method for the collection of data was adopted. In order to analyze population growth and other demographic attributes, data from census and reports of Economics and Statistics Department, Government of Arunachal Pradesh have been used. Owing to the non-availability of secondary information, the narrations of elderly people were used. The English and the Latin names of the different trees and animals have been gathered. Voucher specimens are deposited in the Herbarium of Department of Botany, Rajiv Gandhi University (HRGU), Itanagar.

Results

Akas, while making use of plants, follow certain conservative techniques (Tables 1&2). They always think for the assured future supply. They sparingly extract the required parts of the plant. It is interesting to note that numerous species of animals are found in the area. Though, hunting & fishing are the primary occupation next to *jhuming* (shifting cultivation), people restrain from killing of certain species of animals and contribute towards their conservation (Tables 3 & 4). Their traditional faith and beliefs indirectly help in conservation of forest resources.

The *Akas* conserve the fishes indirectly by practicing traditional techniques such as netting, angling, diversion of river course, *tuvo peo* (use of bamboo traps), *hujii-dow* (community fishing–diversion of big river course) *Minow* (baiting), etc. which are less accurate (Table 5). They spare small fishes even when caught. The local people do not allow the use of chemicals and blasting. Any one found violating the custom is fined and the sum is kept as the development fund of the village.

Sacred groves (*Nowu-Husu Yiew*)

The concept of sacred groves finds mention in ancient Indian literature as *Panchavati*. The plant species have their own significance; therefore, *Hindus* worship the plants that ultimately lead to its conservation and protection⁶. To *Akas*, the *Nowu-Husu yiew* means the forestland and ponds/ lakes, which are believed to be sacred and have vital significance to the mankind is used as substitute to term, sacred groves. The trees which bear a distinct character are protected. It is strongly believed that any sort of interference to such grove would lead to the death of a person involved. Further, they believe the presence of some unseen supernatural power, *ubro* or *ubram* in such grove. As such, these areas remained free from human interference. The area is characterized with hilly terrain and covered with a dense forest. *Akas* worship the forests as *Thouw-gew*, meaning one who nurses and the one who feeds. They also worship the mountains and rivers as *Huda kuwuow phuda kuwuow*; worship the nature and there are some areas at *Palizi* village, *Nechiphu*, etc. which are considered as sacred groves. Visiting and extraction of any kind of material from such groves are strictly prohibited because of its linkage with beliefs and myths. The following places are believed as sacred points by *Akas*:

Mountain *Vojo phu*

The sacred mountain is considered as the highest mountain peak in the *Aka* area (Fig. 6). Extraction of forest materials, collection of stones, hunting, etc. from the mountain is strictly prohibited. A saying goes, *one, who plucks at mountain will lose the way and will bleed to death*. This belief of the people is so strong that even today; no one dares to visit the mountain. Such beliefs have either directly or indirectly helped in the conservation of various forest products of the area.

Table 1—Traditional method of conservation of plant species and its usages

Plant name/ Family/ English name/ local name	Uses	Conservation
<i>Morus laevigata</i> Wall. Moraceae Bola <i>Kiigiitroni</i>	Tree trunks are used as a pillar in house construction.	Felling of such trees is restricted as per the customary laws. Small saplings are always cared.
<i>Terminalia myriocarpa</i> Heurck & Muell. Arg. Combretaceae Hollock <i>Shiiloin</i>	Used as house building material. Branches are used as firewood.	Small saplings collected from river side are planted on the nearby kitchen garden for their needs and requirements in future.
<i>Duabanga grandiflora</i> (Roxb. Ex DC.) Walp. Sonneratiaceae Hokon <i>Kuwogyin</i>	It is used as substitute to hollock in house building.	It is also planted on the nearby gardens for their requirements.
<i>Phoebe goalparensis</i> Hutch. Lauraceae Bonsum <i>Munyumu</i>	Wood used in house building. Fruits are eaten raw with chilly and salt.	Trees are not unnecessarily felled; planted for future requirement.
<i>Litsea cubeba</i> (Lour.)Pears. Lauraceae Mountain pepper <i>Miinyin</i>	Fruits, consumed by people.	Small saplings are allowed to grow freely and protect the tree from any kind of destruction.
<i>Canarium strictum</i> Roxb. Burseraceae Dhuna / Doopa <i>Syobrovji</i>	Aan incense tree, exudates are used as <i>dhuna</i> (incense) in <i>puja</i> .	People do not cut trees and collect the dried incense falling from the tree on the ground.
<i>Rhus javanica</i> Linn. Anacardiaceae Sumac <i>Subyutro</i>	Used for <i>puja</i> decorations/ altars. Fruits are eaten to cure dysentery.	When the trees are over utilized, New trees are planted in and around the village for future requirement.
<i>Callicarpa arborea</i> Roxb. Verbenaceae Tree beauty berry <i>Tuksonyi</i>	Tree very important for marriage and festivals. Trunk is used for sacrificing the mithun (<i>Bos frontalis</i>) for community feast.	They plant small saplings in and around the village for its multiple uses. During marriages and festivals, tree is extracted from the forest.
<i>Dendrocalamus hamiltonni</i> Nees & Arn. Poaceae Bamboo grove <i>Sitru</i>	Traditional house construction; shoot is consumed as vegetable.	People grow bamboo in their yards for future and immediate use. Only the required parts are being extracted and use of.
<i>Ricinus communis</i> Linn. Euphorbiaceae Castor <i>Migyim jyoksu</i>	Leaves used for curing joints fractures; Leaf is slightly heated and tied with a thread on the fracture.	It is protected from damage by wild animals.

Table 2—Tabooed plants and its protections

Plant name/ Family/ English name/ local name	Uses	Conservation
<i>Ficus benghalensis</i> Linn. MoraceaeBanyan tree (Fig. 4) <i>Jigymu</i>	Believed to be very useful for the life of the human beings; Anyone who cuts the tree would suffer from dreadful diseases.	Felling of the tree is restricted for every individual of the village and people worship the tree.
<i>Ficus benjamina</i> Linn. MoraceaeWeeping fig <i>Jigyochu</i>	Believed to be the house of ghosts; do not use any part of this tree.	Do not cut the tree.
<i>Entada scandens</i> (L.) Benth. Fabaceae Ghila lata <i>Kspeo</i>	Fruits, locally known as <i>liiba</i> , are burnt to prevent the entry of ghosts.	Creepers are preserved; cutting in festival and ritual is strictly prohibited.
<i>Ficus glomerata</i> Roxb. Moraceae Cluster fig <i>Syolyen</i>	Felling of the tree leads to skin diseases.	Felling of the tree is prohibited.
<i>Curcuma aromatica</i> Salisb. Zingiberaceae Wild turmeric <i>Kiistradu</i>	Tuber is consumed for curing stomachache; also used before beginning of <i>puja</i> chanting.	Preserved for future use.

Table 3—Traditional practices in conservation of wild animals

Animal name/ Family/ English name/ local name	Peoples beliefs	Mode of management
<i>Panthera tigris</i> Linn. Felidae Tiger <i>Hiitru</i>	The <i>Akas</i> do not consume the flesh of tiger and therefore it is not killed. Killing of tiger is believed to be inauspicious and there is a ritual repentance for killing tiger.	People do not venture for hunting tiger. Tiger is not killed by an individual.
<i>Elephas maximus</i> Linn. Elephantidae Elephant <i>Achie</i>	Killing of elephant is restricted in the <i>Aka</i> area. It is killed only when it causes damages and loss of life & property to the villagers.	The <i>Akas</i> worship the elephants by burning incense (<i>syobrovji</i>).

Table 4—Traditional practices in conservation of birds

Bird name/ Family/ English name/ local name	People’s beliefs	Conservation
<i>Megalaima virens</i> (Boddaert.) Capitonidae Great barbet <i>Sujo</i>	The bird is treated as equal to man. They believe that the chirping of the bird symbolizes the grief or sadness.	The bird is not killed and is conserved because it signals about the approaching bad times.
<i>Ryticeros undulatus</i> (Shaw) Bucerotidae Wreathed <i>Sugro dew</i> <i>Aceros nipalensis</i> (Hodgson) Bucerotidae Rufous-necked <i>Sugro emi</i> Bucerotidae Bicornis Linn. Bucerotidae Great-pied Hornbill <i>Gudruw</i>	The largest bird found in the area. The females are not allowed to eat the flesh of hornbill; therefore, it is not killed.	Management of the bird is done by imposing restrictions among the villagers. The fat of the birds is used by the people for curing chest pain, headache and joints pain. It is killed only when required.
<i>Corvus splendens</i> Viellot. Corvidae Crow <i>Pulwam</i>	The people believe that the bird carries numerous bad diseases.	Killing of the bird is restricted throughout the <i>Aka</i> villages.
<i>Dendrocopos hyperythrus</i> Rufous-bellied Woodpecker <i>Asii-fokki</i>	The bird is believed to be the owner of the sacred thread, which is worn by the <i>Akas</i> in their right hand. They believe that the bird is related to the myth of the creation of the earth and sky.	The birds are never killed. In the forests, when they find the bird they always try to save the bird by allowing it to fly away from the hunters.

Table 5—Traditional practices in conservation of fish

Fish name/ Family /English name/ local name	Peoples beliefs	Mode of management
<i>Schizothorax progastus</i> (McClelland) Cyprinidae Snow trout <i>Chimso</i>	The fish is considered to be the cleanest among the fishes. A dried fish piece is essential for successful completion of a <i>puja</i> , <i>Huda-Kuwuow phuda kuwuow</i> ; worship of river and mountains. It is also essential during harvesting of paddy.	Fish is considered to be lucky because it is used in good times; not killed frequently and is caught through net and other traditional methods whenever required.
<i>Aborichthys elongatus</i> Hora Balitoridae Striped sand loach <i>Trankam duwom</i> <i>Garra maclellandi</i> (Jerdon) Cyprinidae <i>Garra Humey</i>	The fish is considered as bad fish and consumption is restricted for <i>Nugom</i> (rich women) person, who had killed tiger, man, etc. The <i>Akas</i> believe that the fish will never be extinct because they conserve the eggs.	As the consumption of the fish is restricted, only the common people catch them through traditional method of fishing. Small variety of fish, which carries thousands of eggs. The fish lay eggs for at least two months in the small rivulets/streams, which are connected to main river. People catch these fishes only during their return after laying eggs.

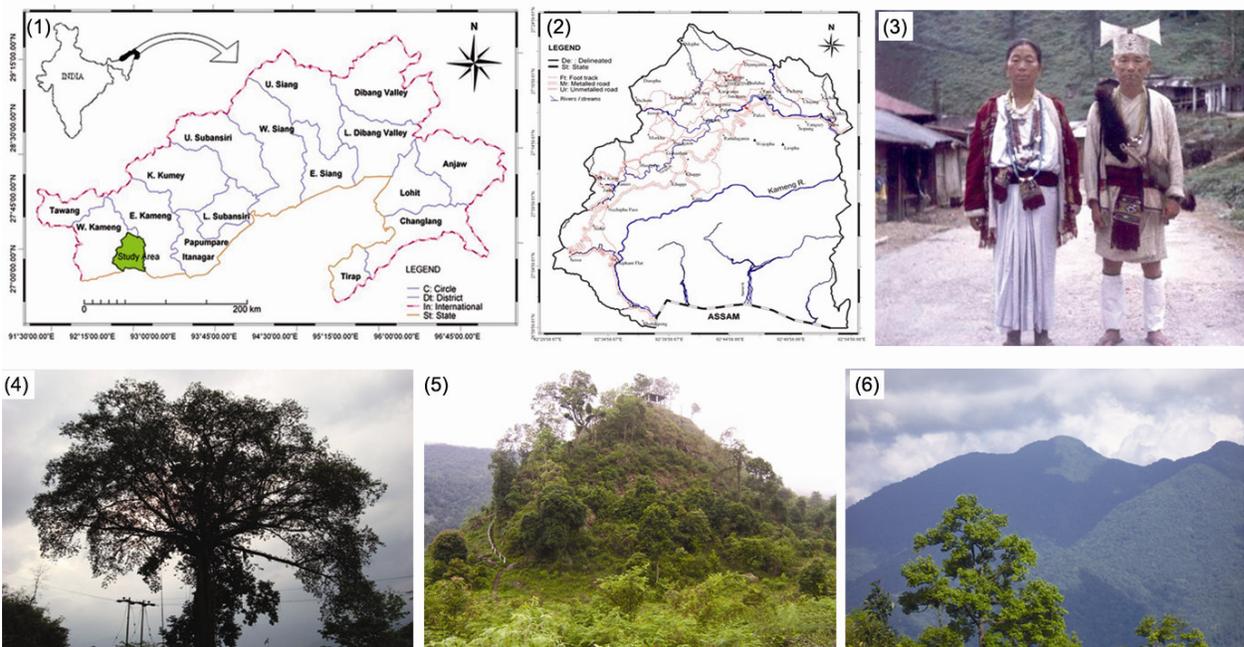


Fig. (1-6)—1. Map of the study area; 2. Base map of the study area; 3. An *Aku* couple in traditional dress; 4. Banyan tree (tabooed tree); 5. A sacred grove at Jamiri village; 6. A sacred grove at Palizi village.

Pond Nearma Husu

The pond is located near the *Nechiphu* pass, which is about 1,524 m above mean sea level. The pond is situated on the top of mountain and has preponderance of betel nut tree and betel leaves plants. These people worship at the pond but plucking of any leaves near this pond is prohibited. The belief, *one who plucks would never return home, and would keep returning here*. The extraction of forest resources from such sacred groves in any form is restricted for every individual throughout the area. There are innumerable myths, songs, folktales, proverbs, etc. regarding divine creations and existence of the forest resources. A song *Asi fokiyo* is related to a bird, named *Asi foki* and its contribution to existence of human beings. A folktale, known as *chicho fumoji* is related to the evolution of a flower, etc. Besides, some areas, such as *Jyopsinfo* at Prizin, *Nyezowoh* at Jamiri, *Paliri-Kunumro* at Palizi, etc. are being preserved and have become places of worship (Fig.5).

Discussion

The *Akas* in order to meet their day to day needs and requirements largely depend on the forests. The traditional ways of hunting, fishing, food gathering and extraction of materials for construction of house are sustainable and conservative. The in-built mechanism in their social and cultural tradition have made them thrifty on over exploitation and contributed towards protection of the forests. The contractors who are tempted to make more earnings do not follow the traditional conservation systems and continue to exploit the forest to a greater extent. The moratorium imposed on timber exploitation did effectively controlled exploitation of forest resources. However, still the illegal extraction of timber is going on covertly in the deep forests. As change is inevitable in every society, the *Aka* society is also experiencing reforms. As a forest dweller, tribes have evolved a distinct pattern of interaction with the forests which is sustainable, ensuring steady supply⁷. Hence, it is hoped that the study could help researchers and scholars working on forests in formulating plans for sustainable utilization and forest conservation. There is a growing realization throughout the world that people's participation is a

crucial factor in sustainable development⁸. Forest policy makers should consider traditional ways of management of their forest to bring more fruitful result and cooperation from local people, rather than imposition of new policies on them. No developed society has just reached the developed stage in one go, every society has to pass through the stage through which the *Akas* are now passing through. The study serves as a case study that elucidates the social change accompanying development. The developed societies should act as a catalyst in the development process without hindering the natural set up and exploitative habits.

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