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Sacred Groves of Ziro Valley Dominated by Apatani Tribes in Arunachal Pradesh

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ABSTRACT

Sacred groves (locally known as *ranthii*) protected by the unique ethnic society of the Apatanis in Arunachal Pradesh are based on traditional, cultural and religious beliefs. These sacred groves are reservoirs of culturally valued species representing relict biodiversity rich ecosystem and are valuable for environment conservation. Sacred species (*Prunus persica*) noticed near the household dwellings assist the onset of the Myoko festival as well as in preparing a platform for executing rituals during the festival. Imparting awareness about the intangible benefits and ecosystem balance provided by the groves to the common man and its utmost significance related to forest ecosystem dynamics and management, protection from excessive human activities, fires, limited extraction of products from these groves, likewise judicious blending of the traditional belief system along with scientific knowledge of modern forest management practices would aid in sustainable ecological conservation.

1. Introduction

Sacred groves are one of the most primitive, but a valuable practice of nature conservation by the traditional societies and are generally governed by religious beliefs and taboos (Arunachalam *et al.,* 2004). In general, the groves represent the climatic climax vegetation of the locality (Gadgil and Vartak, 1975). Nonetheless, it is reported that it might form a clump of trees to hectares in scale. Even individuals of a few plants are attributed to belief system whereby they are considered sacred species as well (Arunachalam *et al.,* 2004). However larger groves are a veritable treasure-trove for the naturalist, supporting many species of plants that are rare in that area, and are becoming rare and rarer with increasing rate of deforestation. They also often act as the last refuge for arboreal birds and mammals especially monkeys, and undoubtedly for other forest loving animals per se. Overall, the 'sacred groves' can be defined as a patch of vegetation, ranging in extent from a few trees to hectares or more, which is left undisturbed because of its association with some deity. In its original form this protection forbade any interference with the biota of the grove whatever, and not even leaf litter was removed from it, nor was grazing or any hunting permitted within the grove. Even when the protection has become less stringent, any removal of the live wood continues to be taboo. These groves therefore represent a sample of the vegetation in its climax state. Arunachal Pradesh in the Indian eastern Himalaya biodiversity hotspot has been embodied with several traditional societies (>100 tribes) that represent a comprehensive landscape for cultural integration on biodiversity conservation (Barbhuya *et al.,* 2007). This paper highlights the inventory of sacred species and sacred groves and their conservation strategies in the Lower Subansiri district inhabited by 'Apatani' tribe in Arunachal Pradesh.

2. Study area

Arunachal Pradesh the 'land of rising sun' formerly known as NEFA (North Eastern Frontier Agency) is situated in the extreme north–eastern region of India. It extends between 91° 30'- 97° 30' E longitude and 26° 28'- 29° 30' N

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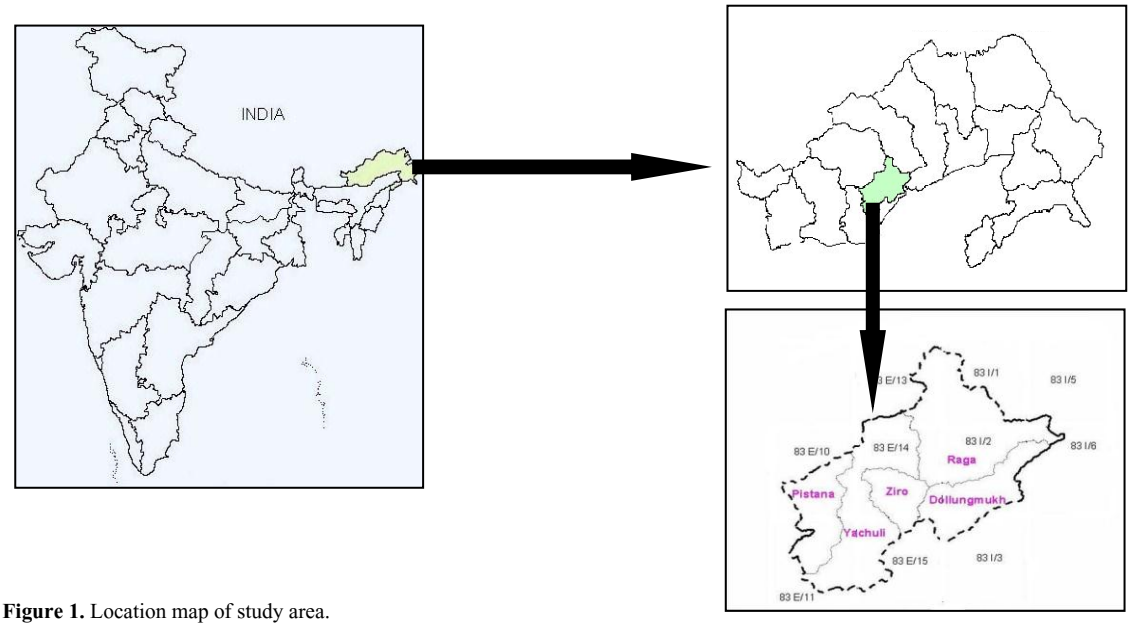

Figure 1. Location map of study area.

latitude covering an area of 83,743 km². The study was conducted in Lower Subansiri district of Arunachal Pradesh (Figure 1). The topography of the study district is mostly mountainous terrain, where the hill range varies approximately from 1000 to 1600 metres above sea level. Ziro, the district headquarter is located at about 1564 m asl. One of the major rivers of this district is Kamala. The origin of the river is from snow ranges of China (Tibet), which flows towards south-east and meets the Subansiri River at Raga Circle. It ultimately joins the mighty Brahmaputra plains in Assam. Khru, Panior, Kime, Panya, Selu, Pugo, Persen, Rein Sipu, Pange, Kiile *etc.* rivers are also worth–mentioning. The economy of Lower Subansiri district is primarily agrarian. But people also involved in rearing livestock, forestry, mining, manufacturing, construction and the trade sector. Vegetation is primarily subtropical to semi–temperate type dominated by *Abies densa*, *Quercus* spp., *Michilus vilosa*, *Schima wallichii*, *Cinnamomum cecidephne*, *Prunus cornata*, *Taxus baccata*, *Cephalotaxus*, *etc.* in the top storey with *Acer* spp., *Rhododendron*, *Pieris ovalifolia*, *Gaultheria*, *Rubus niveus*, *Prinsepia utilis*, *Indigofera* spp., ferns, orchids, medicinal plants, *etc.* as understorey vegetation. Conifers like *Abies densa* and *Pinus wallichiana* are also abundant.

The climatic condition is moderate in the foot hills of the district than in the high altitude areas. Winter is very cold and chill, and summer is pleasant. December and January are generally the coldest month, and July and August are warmest months with heavy rainfall. The annual temperature varies from a maximum of 31˚ C in summer to a minimum of 0˚ C in winter. The relative humidity is relatively greater (>90% during the rainy season. Average annual rainfall of the district headquarter, Ziro has been recorded as 940.86 cm during 2002-2007.

A tremendous volume of quaternary unconsolidated sediment derived by erosion of bordering hills found in the study area. The beds of gravel, inter-bedded sand, grit, clay and peat are almost horizontally deposited. The base of the valley is made of gneiss and schist. The altitude of the valley is ranging in between 1540m to 2684m above mean sea level. The relative relief is ranging from level to 520m. The low relative relief is found in and around Hapoli–Ziro locality which falls in the plain area whereas, higher relative relief is found towards the hills. The average slope ranges from level to 28.40. Level slope covers a big patch within the central portion of basin, which is almost flat (Joshi *et al.,* 2006). Due to high rainfall and humidity earth material weathered very fast and the soils were loamy to clayey in nature with a thick layer of humus at the top, and generally rich in nutrients, especially carbon. Soil acidity ranges from medium to high.

A total of 51 villages are there in Ziro circle, with a total population of 24,703 (male-12,478 and female-12225) and the sex ratio being 980:1000 according to last 2001 census.
In the area,

(i) The low-lying areas are used for wet-rice cultivation,

(ii) Slopes surrounding the wet rice fields are used as garden (*yorlu*) where fruits and vegetables are grown,

(iii) The land further higher than *yorlu* is used for house constructions, bamboo garden, *etc* and the uplands are generally kept aside as pine forests or natural where hunting is normally practiced by the villagers.

3. A bird's eye-view of literature on sacred groves

Gadgil and Vartak (1975, 1976, 1981) made an inventory of the sacred groves or 'devrais' of the state of Maharashtra. They collected the information on the location, area and associated deity for 233 groves from different districts of Maharashtra. Vartak and Gadgil (1981) folklores and traditional belief about sacred groves along the Western ghats from Maharashtra and Goa. Gadgil and Chandran (1992) investigated the sacred groves of Western Ghats and reported that these are the repositories of biodiversity. They found that *gurjan* tree, *Depterocarpus indicus,* has northern limits in the Western Ghats in a couple of sacred groves of Uttar Kannada. Similarly *Myristica* swamp, a rare and threatened habitat, belonging to southern Kerala, has its northern limit once again in a sacred grove of Uttar Kannada. A rare tree species, *Myristica mangifera* and *Pinanga dicksoni, a* beautiful slender endemic palm from the Western Ghats are characteristic plants of this swamp. A new species of a leguminous climber *Kunstleria Keralensis has* been reported from one of the sacred groves of Kerala (Gadgil and Chandran, 1992). Another grove had five species of the evergreen tree *Hopea* of which three are endemic to southwest India. Four more threatened species of plants *Blepharistemma membranifolia, Buchanania lanceolata, Pterospermum reticulatum* and *Syzygium travancorium* has been discovered surviving in the sacred groves of Kerala. A sacred grove in the Maharashtra was found to preserve two magnificent specimens of *Canrium strictum* which otherwise is present only in Uttara Kannada. Gadgil and Chandran (1992) have also noticed a small pocket of endangered primates, lion-tailed macaques, in and around sacred groves, Katlekan of Uttara Kannada Khiewtum and Ramakrishnan (1989) have carried out the socio-cultural studies of the sacred groves at Cherrapunjee and adjoining in the Khasi hills of Meghalaya. About 21 sacred groves locally known as 'Law Kyantang' and 21 reserve forest locally known as 'Law adong', both of which are relict in nature, are reported by authors from Cherrapunjee and adjoining areas. Of the 21 sacred groves, six are highly disturbed and five moderately disturbed. Ramakrishnan and Ram (1988) emphasized that sacred groves help in preserving the indigenous flora of the Cherrapunjee, which otherwise is highly degraded, and desertified. Boojh and Ramakrishnan (1983) argued that with the ongoing deforestation activities at large scale, the religious beliefs are the only hope and way of conserving these relict vegetation. These forests form a storehouse of many endangered plant species such as *Dendrobium, Cymbidium* and *Vanda* (Ramakrishnan, 1978) including useful medicinal plants.

Khiewtum and Ramakrishnan (1993) have also studied the vegetation, litter and fine root dynamics, and nutrient flow in a sacred grove at Cherrapunjee. Earlier, Hazra (1975) published a taxonomic account of the sacred grove at Mawphlang in Meghalaya. Khan *et al.* (1987) studied the regeneration status of tree species of Mawphlang. Barik *et al.* (1996) and Rao *et al.* (1990, 1997) studied community composition, gap phase regeneration, and regeneration ecology of dominant tree species in this sacred grove. Khan *et al.* (1997) assessed the effectiveness if the protected area network in biodiversity conservation in Meghalaya. They reported that 133 (4%of the total plant species in state) are confined to sacred groves. Tiwari *et al.* (1998) inventoried the sacred groves of Meghalaya and studied for their biodiversity value, status and vegetation characteristics. They reported seventy-nine sacred groves. Authors tried to ascertain the status of sacred groves through canopy cover estimate. According to their estimate, 1.3 % of total sacred grove area was undisturbed, 42.1% had relatively dense forest, 26.3% had sparse canopy cover, and 30.3% had open forests. They also reported higher species diversity indices for the sacred grove than for the disturbed forest. The species composition and community characteristics were also reported significantly different for the two forests.

A total of 166 sacred groves were inventoried recently from Manipur valley (Devi *et al.,* 2004). They stated that various ethnic groups of northeast India have preserved and protected several forest patches and even individual trees due to their belief in nature-worship. However, due to population explosion and various developmental activities, forests are being destroyed thereby altering the composition and diversity of species, leading to a rapid loss of many important species, including rare and endemic ones. Besides, in many areas the forestland has been converted into wasteland and the natural environment has been adversely affected. It is in this context that the traditional ecological knowledge and resource management systems, practiced by the indigenous communities, need to be properly understood and revived in order to conserve such relict vegetation. Dedicating a patch of forestland to deities is a common practice with the Meitei community of Manipur. This practice assumes great significance in biodiversity conservation. In ancient Manipuri culture, people worshipped natural phenomena like the sun, moon, sky, water and fire. They followed ancestral practices of animism with the central focus being on the worship of forest patches that they regarded as sacred abodes of various deities. According to their belief, these forest patches (or sacred groves) are the property of gods/deities and must therefore not be damaged in any way. The *'Umanglai'* (sacred deities or sylvan-deities) are the only mysterious deities believed to reside in sacred groves of Manipur.

Umanglais are worshipped annually through celebrations called *'Lai-Haraouba'* on the pleasing of God in their dwelling groves.

4. Global presence of Sacred groves

Sacred groves are a very ancient and widespread phenomenon in the old world cultures. They are mentioned in Greek and Sanskrit Classics and are reported to exit today in a number of countries besides India, *e.g.* Ghana, Nigeria, Syria, Turkey. In India, they have been reported from the entire length of the North-Eastern India, Western Ghats, and some parts of Orissa, Garhwal Himalayas, and West Bengal. The reigning deities of the groves in Karnataka and Kerala are cobras rather than Mother goddesses as in Maharashtra. Aravalli hills in Rajasthan have groves dedicated to a mother goddess Jog Maya. A bird's eye view on available information on sacred groves in the two biodiversity hotspots *viz,* Western Ghats and Eastern Himalaya has been summarized in Box 1. Sacred groves of northeast India are dedicated to some spiritual super powers and in particular, Nagaland groves are preserved as because peoples believe that some ghost is residing in such patches. Arunachal Pradesh in the north east was so far unexplored for which bestowed feature of natural habitat conservation. Recently, Barbhuiya *et al.* (2008) had undertaken a pilot study on documentation of sacred groves in Arunachal Pradesh and is being continued by the present research group.

5. Sacred groves in Ziro

A survey was undertaken in the sacred groves in Ziro valley as part of a major research project on 'Cultural Landscapes: The basis for linking biodiversity conservation with sustainable development in Arunachal Pradesh' sponsored by UNESCO, New Delhi. A total of six groves were observed having sacred values associated with traditional societies living nearby (Table 1). Sacred groves (locally known as 'ranthiis') are located in the periphery of the Apatani villages and each 'ranthii' is associated with the corresponding village and may be single or as more as 3 in case of Hari village (Table 1). Thus each clan has their own Ranthii. Some of them are Nani–Tajang Ranthii, Hong Ranthii, Mudang Tage Ranthii, Dutta Ranthii, Bamin–Michi Ranthii. The myth of these groves lies in the fact that the plants on that particular plot were planted by the forefathers of the villages in the past and which in due course of time were abound with many naturally growing flora. The people as a respect for their forefather's task preserve these groves. The people also believed that these groves dwell many spirits and their destruction would have ill effect on the person who disturbs these spirits. These groves aren't used for economic purposes, but are rather kept undisturbed being sacred. According to a few educated people in the traditional society, their forefathers knew about the conservation process so they had discouraged the destruction of these groves. They further envisaged that in times of disaster these sacred groves could be used as a resource, hence their forefathers forbade them from destroying these sacred groves.

Box 1. Opportunities and threats

Sacred groves have been a significant traditional forest management practice that people have followed since time immemorial as also a mode of nature conservation. Such conservation practice has brought us aware about the species diversity most of which are otherwise under endangered/threatened category. However, apart from increasing population and massive burden over the land, owning to expanding awareness among the people and education to some extent have contributed significantly in overcoming these superstitions and have resulted in the erosion of religious beliefs ending up in destruction of these groves too. In spite of all these, some patches are still being conserved as sacred groves mainly due to ethics behind traditional folklores and beliefs. This kind of preservation of entire vegetation associated with a deity is quite distinct from the preservation of sacred plants by Hindus viz., *Ficus religiosa* or *Ocimum sanctum.* The belief as a system of faith and worship of supernatural in the form of nature was practiced with full faith till Christianity was introduced into the region. However, even now in interior villages' people still practice the old tradition and continue with their belief system.

It may be cautioned that due to intrusion of modern culture the aboriginals are shifting to the urban culture. Further, with the weakening of the religious structure, the old custom and beliefs are being ignored and are likely to be forgotten in the near future. Hence, neutral ecosystems like the sacred forest are likely to be denuded. Hence, there is always the danger that unless conservation measures are taken along with suitable of resources, north–east India in particular may lose its valuable plant biodiversity that have medicinal, recreational, horticultural and crop value, apart from other goods and services provided by these traditionally protected systems.

Table 1. Sacred groves in and around Ziro, Lower Subansiri district of Arunachal Pradesh.

Sl. No	Name of villages	Name of sacred groves	Latitude(N)	Longitude (E)	Altitude (m asl)	Population(in persons)	No. of sacred groves
1.	Bamin-Michi	Bamin Michi *ranthii*	27º34'07"-27º34'21"	93º49'33"-93º49'39"	1615	Bamin-157 Michi -188	1
2.	Dutta	Dutta ranthii*	27º34'39"-27º49'40"	93º49'47"-93º49'46"	1548	404	1
3.	Hari	i)Puming pubiang ii)Suthii pach eko iii)Yapun yapyo	27º35'02"-27º35'08" 27º35'48"-27º34'58" 27º35'00"-27º35'52"	93º51'40"-93º51'46" 93º51'02"-93º51'05" 93º51'10"-93º51'13"	1618.50 1623.25 1625.80	Hari –I 436	3
4.	Hong	Saro samii	27º33'12"-27º34'09"	93º50'35"-93º51'34"	1568	Hong I-1019 Hong II-512 Hong III-704	1
5.	Mudang -Tage	Dilang posa	27º34'22"-27º3428"	93º50'04"-93º50'11"	1564.50	M.T.-I 177 M.T.-II 370	1
6.	Nani-Tajang	Nani-Tajang ranthii*	27º36'02"-27º36'09"	93º50'18"-93º50'20"	1563	Tajang-612	1

Note*: Some sacred groves have their traditional name or often called as 'Ranthii' along with the name of the village.*

6. Sacred species

The sacred species are used as a platform for performing rituals during the Myoko festival. Each Apatani clan has a common sacred tree, *Prunus persica* (as found in most of the Apatani villages). This tree is believed to be sacred and its destruction is discouraged. Apart from the clan's common sacred tree, each house or family also grow this tree at the backyard, sometimes adjacent to frontyard or even in kitchen gardens. From time immemorial, this particular tree has been regarded as a sign to commence the celebration of the Myoko festival when it flowers during the last of February or the onset of March. People perceived the direction of flowering that has been regarded as an indication for which clan to celebrate the Myoko festival. The Apatani tribe for the convenience of celebrating the Myoko festival has been divided into 3 groups (Table 2).

Table 2. Village group for Myoko festival

Group name	Village (s)
Talyang- Hao	Hari, Kalung, Reru and Tajang
Niichi–Niilii	Hong
Tiini-Diibo	Hija, Dutta, Mudang-Tage, and Bamin- Michi

In the recent days, these groups have been celebrating the Myoko festival alternately that however does not correspond to the flowering of the peach tree.

The Myoko festival is celebrated for the welfare of the village and community, usually from March 20th onwards. Monkey is the most auspicious part of the festival. Monkey head is offered and it is believed that without monkey head their ancestral God will not be happy, and therefore would not shower blessings. And finger of the monkey is distributed among each '*NAGO'* (tribe) if finger is not enough even the ear is shared. The month long '*MYOKO'* festival is hosted by single village for the whole Ziro valley. In the last part of the festival, community hunting for about 2-3 days is permissible in the community/village forest.

7. Conservation strategies

The ancestors of the tribal societies had recognized the fragility of the ecosystem, which had thin topsoil with low carbon nitrogen contents. They had presumably realized the significant role of forests in such fragile ecosystems and perhaps, appreciated the conservational value of forests, particularly in protecting water resources and maintaining viable populations of game animals, which is evident from the location of the groves. The beliefs and rituals associated with sacred groves were probably used as a means of conservation. They perpetuated and transferred this knowledge accumulated over thousands of years of cultural experience to subsequent generation (Harp, 1994). The religious beliefs and rituals are central to sacred groves preservation and are now fast eroding and therefore these treasure houses of biodiversity cannot be protected

indefinitely only through religious beliefs. Urgent external intervention has become inevitable if these forest patches, providing valuable ecosystem services to the local communities, are to be saved and conserved for environmental sustainability. Following could be some of the adaptive strategies to achieve the same.

- Complete inventory of sacred groves in the region and digitizing the information creating a data bank.
- Appropriate valuation of biodiversity resources in sacred groves and envisaging the ecological economics thereof.
- Introduction of community resource mapping and people's biodiversity register for documentation and self–governance.
- Creation of mass awareness about the intangible benefits and ecosystem services (Cairns and Pratt, 1995) provided by these forest patches and their biodiversity value would be another essential components of the proposed conservation programme.
- Developing and means of measures for limited extraction of produce to sustain the interest of people in preservation of the groves is also required.
- Protection from fire, cattle grazing and unauthorized product extraction is paramount to any conservation programme, and this can only be achieved through active people's participation.
- Site specific conservation/restoration strategies need to be evolved that consider the status of the groves and socio-economic condition of the people responsible for its management.
- Practically, a judicious blending of traditional knowledge and beliefs with the modern forest management practices can help in sustaining the undisturbed groves. However, the degraded sacred groves will need a higher level and more influential intervention requiring higher cost in terms of material and personnel for their restoration.
- One of the strategies of external intervention may be providing economic incentives to the people who are protecting/managing the groves and also to the people living in the surrounding area.

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