



FIELD FORESTER

Voices from the Field



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FORESTS AND PEOPLE

Significance of sacred groves in conservation of floral diversity

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Remnants of ancient sacred groves containing 10-20 trees, amidst denuded lateritic expanses were found in almost every tribal village in the Western Midnapore district of West Bengal

INTRODUCTION

Patches of vegetation protected on religious grounds are called sacred groves. Sacred groves occur in India and in other parts of Asia, Africa, Europe, America and Australia. In India, they are mainly distributed in the states of Andhra Pradesh, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Orissa, Rajasthan, Tamil Nadu, Uttarakhand, West Bengal and the Union Territory of Puducherry (Malhotra *et al.*, 2001; Ramanujam *et al.*, 2007). Sacred groves are priceless treasures of ecological, biological, cultural and historical value. As a result of the high conservation and biodiversity values, increasing attention is being paid to their potential as a tool

and model for biodiversity conservation (Gaikwad *et al.*, 2004). According to the National Environment Policy of India, ancient sacred groves should be treated as possessing "Incomparable Values" (Government of India, 2006).

The institution of sacred groves dates back to the pre-agrarian hunting-gathering phase of human civilization (Kosambi, 1962) and they can be considered as one way of expressing the gratitude of man towards the vegetation which sustained and supported their life. They represent the past status of vegetation and biotic as well as the abiotic diversity of the region and are abodes of rare, endangered and threatened species. Many valuable medicinal plants and wild relatives of cultivated species are present in the groves which may have a definite role to play in the future species improvement programmes.

Though the tradition of sacred groves is reported from most parts of India, very less number of them are enumerated, documented and studied (Gokhale, 2005). The total number of sacred groves in the country is likely to



be between 100,000 and 150,000 (Malhotra, 1998) and the latest number of sacred groves known is 13,720 (Malhotra *et al.*, 2001). The vast diversity of India has given different names to them as *Than* or *Madaico* in Assam, *Matagudi*, *Devgudi* or *Sarana* in Chattisgarh, *Dev Van* in Himachal Pradesh, *Jaherthan* or *Sarana* in Jharkhand, *Devarakaadu* or *Kans* in Karnataka, *Kaavu* in Kerala, *Devrai* or *Devgudi* in Maharashtra, *Umang Lai* in Manipur, *Law Kyntang* or *Law Niam* in Meghalaya, *Jahera* or *Thakuramma* in Orissa, *Orans* in Rajasthan, *Kovilkaadu* in Tamil Nadu, *Bugyal* or *Dev Van* in Uttarakhand and *Garamthan* or *Jahiristhan* in West Bengal. They may vary in size from a few trees to dense forests covering extensive tracts of land.

Pioneering Studies

Despite many references to the sacred groves and sacred trees of India in early literature, the scientific study of them was initiated by Gadgil and Vartak (Gadgil and Vartak, 1975). Gadgil (1985) pioneered the view that sacred groves and sacred trees belong to a variety of cultural practices which helped Indian society to maintain an ecologically steady state with wild living resources.

New Reports

A new genus and species of climbing legume, *Kunstleria keralensis*, was identified from a sacred grove in Kerala (Mohanani and Nair, 1981). Four threatened species *viz.*, *Buchanania lanceolata*, *Blepharistemma membranifolia*, *Pterospermum reticulatum* and *Syzygium travancoricum* have also been

rediscovered from the state (Nair and Mohanan, 1981). Kushalappa and Bhagwat (2001) reported a new species of fungal genus *Xylaria* from the sacred groves of Kodagu district, Karnataka.

Wild Cultivars

Presence of wild cultivars of crop plants which have better pest resistance and productivity has been documented from the sacred groves of Kerala (Ramachandran and Mohanan, 1991). Some of the notable wild relatives of cultivated plants found in the sacred groves of Western Ghats include *Garcinia* spp., *Artocarpus* spp., *Piper* spp. and mango. Wild turmeric (*Curcuma* spp.), wild ginger (*Zingiber* spp.) wild rice (*Oryza* spp.) and wild nutmeg (*Myristica malabarica*) have also been reported (Chandran *et al.*, 1998).

Good Balance

Chandran and Gadgil (1993) gave an account of the two categories of sacred groves of Karnataka, (a) smaller groves which are entirely protected with no tree felling or biomass extraction and (b) larger groves which function as resource forests, offering both livelihood sustenance and ecological



security. The villagers may gather fallen deadwood, non timber forest produce or tap toddy from *Cayota urens*. In Rajasthan, sacred groves in the western arid tract are a major source of green fodder and water. In other parts of the state, the resources in groves are used in controlled fashion or only in case of emergency (Pandey, 1998). There are numerous groves in Kerala from which no plants are removed (Pushpangadan *et al.*, 1998) whereas some of the groves provide livelihood to many artisans (Unnikrishnan, 1990).

Conservation

Following the studies on arboreal plants and lianas which showed exceptional growth in sacred groves of Maharashtra, Upadhye *et al.* (1987) emphasized the need for conservation of these groves. Studies made by the Botanical Survey of India in general and contributions of Dr. V.D. Vartak, in particular, have greatly helped in understanding the importance of sacred groves and their conservation in Maharashtra state. Increasing pace of deforestation owing to increase in population and commercialization of agriculture was identified as the major reasons for the deterioration of many sacred groves in the state.

Kulkarni *et al.* (1993) reported that avoidance of human and animal interferences in a sacred grove in Orissa resulted in rich varied and storeyed vegetation when compared to the adjoining areas. Field surveys conducted in several villages of West Bengal and Orissa revealed that strict

cultural taboos existed in the harvesting of plant biomass and hunting of animals in sacred groves and no forest produce was exploited for commercial purposes. Though no policing or monitoring was carried out by humans, most of these groves were found undisturbed (Malhotra *et al.*, 1998). With reference to the sacred groves of Karnataka, they fall under two categories. The smaller groves are entirely protected; no tree felling or other biomass extraction may be allowed. On the other hand, larger groves function as resource forests offering both livelihood sustenance and ecological security. The people of the village may gather fallen deadwood, non-wood produce such as pepper, mango, jackfruit etc. and tap toddy from *Cayota urens* (Chandran and Gadgil, 1993).

Among the Gangte tribe in the state, extensive tracts of land were traditionally not subjected to shifting cultivation since these were considered to be sacred groves and believed to be abode of spirits (Malhotra *et al.*, 2001). There are also forest belts protected as sacred around the habitations called as *gamkhap*. Gangte tribals also have small reserves of bamboo called *mauhak*. Extraction of bamboo shoots from *mauhak* is totally prohibited (Gadgil and Vartak, 2004).

Forests and Biodiversity Conservation Division, WWF-India attempted a preliminary documentation of the sacred groves and their locations in the states of Sikkim and Arunachal Pradesh (Chatterjee *et al.*, 2004). In Meghalaya, considering the vast areas under the

sacred groves, big size of individual grove, their location on critical sites and the religious taboos attached to them, the concept of sacred groves conservation seems to be an indigenous knowledge system conceived, developed and perpetuated by the indigenous tribal people of the state. It was found that generally, 70% of the local people around the sacred forest areas are quite ignorant about the available resources and its status (Singh and Bora, 2004).

Around 150 groves have been reported from Jammu and Kashmir. In larger groves normal forestry operations are carried out and the income goes to shrine. Small groves are highly protected and any removal is a taboo. Protection of the groves are offered voluntarily by the people living around.

Floristics and Ecology

Vartak (1983) gave an account of the climax type of vegetation in the sacred groves of Western Maharashtra and enumerated 38 species of endangered endemic plant species from 12 selected groves. Sacred groves from an important landscape feature in the deforested hill ranges of the Western Ghats of Maharashtra. About 790 species of plants belonging to 352 genera were reported from the groves. Felling of timber and killing of animal in sacred groves is a taboo in Maharashtra. However, the local community can use twigs, leaf litter, fruits and herbs that grow in them. The Mahadev Kolis tribe of Maharashtra follow slash and burn

cultivation. The sacred groves are the only piece of forest in their area that is kept untouched. Mohanan and Muraleedharan (1988) have enlisted the rattan resources of the sacred groves of Kerala. A unique mangrove sacred grove of about 18 acres has been reported from Kannur district of the state (Unnikrishnan, 1995). Presence of sacred mangroves has also been reported from Gujarat, Goa, Maharashtra West Bengal and Karnataka (Untawale *et al.*, 1998; Chandran *et al.*, 1998). A total of 60 mangrove species belonging to 41 genera under 29 families are known from the Indian coasts. Myristica swamps which form one of the unique ecosystems in the Western Ghats have been represented by sacred groves in Uttara Kannada district in Karnataka (Chandran and Mesta, 2001).

As the existing forest classifications are not suitable to reflect local variations on a smaller scale, Induchoodan (1996) devised a new classification to describe the sacred groves of Kerala and identified 21 different associations. He has also documented the presence of 722 species of plants spread over 474 genera and 128 families from 761 sacred groves of the state.

Madhya Pradesh is one of the tribal dominated state in Central India (19.9%) and they conserve a large number of plants in sacred groves commonly known as Deogudi/Sarnas. The tribals have immense knowledge on the medicinal uses of these plants. They believe that if the plants are not maintained properly or destroyed, natural calamity will ruin their clan.

There are about 25,000 major orans in Rajasthan covering about 600,000 hectares (ha). About 1100 major orans covers 100,000 ha, and in Thar desert alone 5,370 sq.km is covered by orans. These orans fulfill the real needs of local people (Singh, 2011).

A baseline floristic survey conducted in 79 sacred groves in Meghalaya revealed that at least 514 species representing 340 genera and 131 families were present in these groves (Kharshi-ing *et al.*, 2005). The status of sacred groves was ascertained through canopy cover estimate. Khan and Barbhuiya (2011) reported that about 166 sacred groves occur in different parts of Manipur. Rajendraprasad *et al.* (1998) reported the results of the study on the life forms of angiosperms in 200 groves sampled throughout Kerala. The similarity between Raunkiaer's normal life form spectrum (Raunkiaer, 1934) and that of the sacred groves indicated that the vegetation of the groves represents a relic of the evergreen tropical rain forest. Pushpangadan *et al.* (1998) also demonstrated that the biological spectrum of sacred groves in Kerala closely resembles the typical spectrum of tropical forest biodiversity.

In Tamil Nadu, the eastern districts without any forest cover have more number of sacred groves than forested districts on the western side and a total of 448 groves have been reported from the state (Amrithalingam, 1998). Britto *et al.* (2000) studied the ethnobotany of the sacred groves in Shervaroy, in the state. In a study of sacred groves of Kodagu, Karnataka, it was identified

that well-conserved sacred groves had higher densities (5120 seedlings per ha) of the threatened flora than the disturbed sacred groves (4288/ha) as well as reserve forests (4800/ha). However, in terms of species richness, conserved sacred groves were comparable to that of reserve forests (Boraiah *et al.*, 2002). Comparative studies conducted between sacred groves and natural forests with reference to the richness and regeneration of medicinal plants in central Western Ghats region revealed that the density of regenerating medicinal plants among sacred groves was almost twice as that of reserve forests (Boraiah *et al.*, 2003). These results suggested that informal management systems such as sacred groves have not only conserved useful species, but people have tended to discover medicinal values more often among plants unique to sacred groves, than those found in other landscapes.

A survey conducted by WWF-India recorded over 800 sacred groves from Andhra Pradesh, spread over 23 districts. They also found that, 100 of these groves were rich in bio-diversity and reported about 134 species of medicinal, rare and endemic plants (Das *et al.*, 2004). In Madhya Pradesh, many valuable medicinal plants have been conserved in sacred groves by tribals. Sixty rare, endangered and threatened (RET) species from 40 families were recorded from the sacred groves in Kanyakumari district, Tamil Nadu. Forty-two species were found endemic to the Western Ghats and their study pointed out that even climax vegetation of various altitudes and

latitudes could be conserved *in-situ* in sacred groves.

One hundred and seventy-three plant species representing 145 genera under 70 families were recorded through baseline floristic survey of the sacred groves in Manipur. 96% of the species are being used as medicines (Ashalatha *et al.*, 2005).

Floristic diversity studies in *Iringole Kavu*, an important sacred grove of Kerala having an area of 20 ha revealed the presence of 94 plant species belonging to 85 genera and 52 families with Euphorbiaceae as the dominant family. Analysis of flora of this grove proved similarity to pure climax evergreen vegetation typical to the lower altitudes of the Western Ghats. Eight species endemic to Western Ghats were also recorded from the grove (Subramanian *et al.*, 2005). Vidyasagaran *et al.* (2005) undertook vegetation studies in a highly specialized freshwater swamp sacred grove near Thrissur in Kerala and reported the dominance of an endemic species, *Syzygium mundagam*. Warriar *et al.* (2008) reported 1128 sacred groves from Alappuzha district in Kerala where no natural forest exists. Floristic inventory carried out in all the sacred groves recorded a total number of 687 plant species belonging to 493 genera and 127 families.

Most of the sacred groves in Kerala are veritable sanctuaries of flora and fauna. Many of them can be seen in combination with sacred ponds and they also act as micro-watersheds of freshwater systems. Some groves give

birth to streams and even rivers as in case of river Kavvai originating from Theyyottukavu in Kannur district (Mohanan and Prasad, 2004). A study conducted by the Tropical Botanic Garden and Research Institute, Thiruvananthapuram, Kerala revealed that structurally, the vegetation of the sacred groves is typically of tropical evergreen forest in general with several tiers or types of trees, climbers, shrub and undergrowth. Floristic diversity indices of the sacred groves of Kerala are equal or nearly equal to the forests of the Western Ghats (TBGRI).

Sacred groves of the state are mainly owned and managed by ancestral families, cluster of related families, village communities or temple trusts. Some are under the control of Devaswom Board, Government of Kerala.

Major Threats

Severe damage and destruction to many sacred groves has been reported from a number of areas in India (Nair *et al.*, 1997). Singh (1997) conducted a socio-cultural evaluation of sacred groves in North Western Himalaya (Kullu district, Himachal Pradesh) and reported that social change and agricultural development such as monocropping were the major reasons leading to the destruction of these remaining patches virgin forests. Remnants of ancient sacred groves containing 10-20 trees, amidst denuded lateritic expanses were found in almost every tribal village in the western Midnapore district of West Bengal (Deb *et al.*, 1997). The WWF-India, examined

the status of the sacred groves in Andhra Pradesh and identified threats for their existence. Changes in religious beliefs, socio-economic scenario, increasing human population and developmental pressures have been identified as the major reasons for deterioration of groves (Das *et al.*, 2004). Uncontrolled inflow of visitors and soil excavation works were found to upset the balance of a rare freshwater swamp sacred grove ecosystem in Kerala (Vidyasagaran *et al.*, 2005). Ghate (2011) reported that many sacred groves in Maharashtra were converted to green lands under social forestry by planting species like *Acacia auriculiformis*.

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