

Article

Analysis of Local Attitudes Toward the Sacred Groves of Meghalaya and Karnataka, India

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Abstract

The sacred groves of India represent a long-held tradition of community management of forests for cultural reasons. This study used social science research methods in the states of Meghalaya and Karnataka to determine local attitudes toward the sacred groves, elements of sacred grove management including restrictions on resource use, as well as ceremonies associated with sacred groves. Over a seven-month period, 156 interviews were conducted in 17 communities. Residents identified existing taboos on use of natural resources in the sacred groves, consequences of breaking the taboos, and the frequency and types of rituals associated with the sacred groves. Results show that numerous factors contribute to pressures on sacred groves, including cultural change and natural resource demands. In Meghalaya, the frequency of rituals conducted in association with the sacred groves is declining. In both Meghalaya and Karnataka, there is economic pressure to extract resources from sacred groves or to reduce the sacred grove size, particularly for coffee production in Kodagu in Karnataka. Support for traditional ceremonies, existing local community resource management, and comprehensive education programs associated with the sacred groves is recommended.

Keywords: sacred grove, community management, sacred forest, traditional conservation practices, sacred natural sites, Meghalaya, Karnataka, India

INTRODUCTION

Sacred forests, often referred to as sacred groves, are sites that have cultural or spiritual significance for the people who live around them. They have been protected by communities around the world for a variety of reasons, including religious practices, burial grounds, and watershed value (Lebbie and Freudenberger 1996; Chandran and Hughes 1997; Malhotra et al. 2007; Sheridan and Nyamweru 2007; Ormsby and Bhagwat 2010; Ormsby and Edelman 2010). India has the highest concentration of sacred groves in the world—estimated to be over 100,000 sacred groves (Malhotra et al. 2007)—yet

these are disappearing due to cultural change and pressure to use the natural resources that they contain (Chandrakanth et al. 2004). The size of the sacred groves varies greatly from small plots less than one hectare to larger tracts of hundreds of hectares (Ntiemoa-Baidu 1995; Malhotra et al. 2007). In some cases, these fragments represent the sole remaining natural forests outside of protected areas and may be key reservoirs of biodiversity. Sacred forests are known to conserve habitats that are not represented in the current protected area system (Bhagwat and Rutte 2006), and serve as refugia for endemic species (Jamir and Pandey 2003). These have been reported to be relict forests and may be the only remaining climax vegetation of an area, although many are now disturbed as a result of human actions (Gadgil and Vartak 1976; Khiewtam and Ramakrishnan 1989; Kalam 1998; Tiwari et al. 1998; Upadhaya et al. 2008). Traditional rules support conservation by limiting activities within sacred forests. Sacred groves also provide ecosystem services, such as erosion control and maintenance of water quality (Tiwari et al. 1998). This paper presents the results of a comparative study of sacred groves carried out in two states of India, Meghalaya and Karnataka.

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Whereas numerous ecological studies of sacred groves in India have been conducted, the cultural dimensions of sacred groves have not yet been studied in detail. Gauging how local residents and managers perceive sacred groves is essential to determining how these forest areas may be protected and managed in the future. Therefore, to add to the existing scholarship on sacred groves in India, an analysis of the ethnographic aspects of the sacred groves and changing practices is still needed. In addition, since India is such a diverse country, an in-depth treatment of regional practices (like the one presented in this paper) is a valuable contribution to the literature. In addition, in India religious aspects of sacred groves vary depending on the region. The regions of this study were intentionally chosen to contrast two very different religious associations with sacred groves in India.

Qualitative, semi-structured interviews were conducted with 156 residents near the sacred groves in two regions of India to investigate past and current management of the sacred groves including rituals conducted, restrictions on resource use, and pressures on sacred grove resources. What is unique about this study is that it offers a comparative analysis of these two regions, which were selected as study sites due to the fact that both areas have high biodiversity and number of sacred groves, yet have contrasting religions and cultures.

METHODS

Research was conducted from October 2009 to May 2010 in two main locations in India, in the states of Meghalaya and Karnataka (Figure 1). During the research period, 72 interviews were conducted with residents of 8 villages near the sacred forests in the East Khasi Hills, the West Khasi Hills, and the Jaintia Hills districts of Meghalaya (42% female, 58% male),

and 84 interviews (44% female, 56% male) were conducted with residents of 7 villages near the sacred forests in Kodagu district (also called Coorg) in southern Karnataka. Study villages were selected with the assistance of local sacred grove experts affiliated with the North-Eastern Hill University, Meghalaya and the College of Forestry, Ponnampet, Karnataka, based on locations that were known to have sacred groves. For the Kodagu district Karnataka, the Forest Department has a list of sacred groves, which was used to narrow study site selection. An attempt was made to select some sites that had previously been studied for their botanical richness, in order to get a fuller picture of the management and the conditions of the sacred groves.

A qualitative, mixed methods ethnographic research approach was used, including interviews, participant observation, and focus groups (Weiss 1994; Morgan 1997; Creswell 2003; Bernard 2011). Semi-structured interviews were conducted with a translator using a 30-question interview guide in each of the communities associated with the sacred groves studied. The questionnaire contained questions relating to sacred grove management and resident attitudes, as well as basic demographic information. First, a map of each community was created. Interviewees were selected using a variety of approaches—key informant, snowball sampling, and stratified sampling by village neighborhood and by occupation (Babbie 1990). In each location, the sacred grove manager, the community leader, and/or the temple committee members (key informants) were approached for permission to conduct research and to seek a person with whom to visit each sacred grove. In some cases, focus groups were held. The research sample was stratified by occupation and by gender. In order to obtain a diversity of perspectives, residents representing a variety of occupations were sought, including farmer, priest, teacher, and herbalist. In particular, people who might use or manage the sacred grove were interviewed. An attempt was made to get an even gender distribution of interviewees, but this was not achieved in every community due to unavailability of interviewees at the time of the interviews.

Most interviews averaged one hour in Meghalaya and two hours in Karnataka due to the detailed explanation of festivals related to sacred groves. Each community was visited for a minimum of two days, and several communities were visited numerous times over a period of several weeks. The following three main themes were investigated using the 30-question interview guide to offer insight on past and present practices relating to the sacred groves:

- Restrictions on the use of resources in the sacred groves;
- Rituals associated with the sacred groves; and
- How the sacred groves are managed, and by whom.

Many communities have more than one sacred grove. According to past Forest Department surveys, in Kodagu district, each of the villages surveyed had at least one sacred grove, and up to 15 sacred groves associated with it. The sacred groves were visited with a community member when possible, to get a sense of the sacred grove size, the level of disturbance,

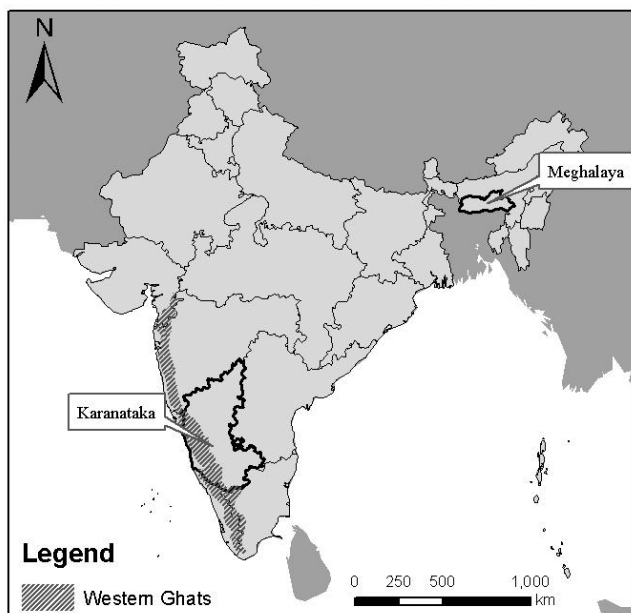


Figure 1
Locations of study regions within India

the presence or absence of a shrine, and the location of the sacred grove in the community. Over 35 sacred groves were visited in the study areas of the two states. Site selection and access was limited by some logistical constraints, including availability of translators and transportation. In Kodagu district, Karnataka, nine sacred grove festivals were observed in March and April 2010. The sacred grove festivals offered an opportunity for participant observation (DeWalt and DeWalt 2011). In addition, during these festivals, the inclusion of sacred groves in the festival activities was observed.

Description of study sites

The states of Meghalaya and Karnataka were selected as focal study areas for a variety of reasons. First, both regions have numerous sacred groves, and local scholars have already conducted studies of the biological richness in some of these sacred groves. The Kodagu district of the Western Ghats alone contains over 1,200 sacred groves, with one forest grove for every 300 ha of land (Boraiah et al. 2003; Bhagwat et al. 2005b). Both sites are globally recognised biodiversity hotspots—Kodagu district lies in the Western Ghats region, and Meghalaya lies in the Indo-Burma region—meaning that these areas have high concentrations of unique species and at the same time are under extreme resource use pressure (Myers et al. 2000; Jamir and Pandey 2003). Both of these regions have been identified as key areas for biodiversity conservation due to their high species diversity and high levels of endemism (Khan et al. 1997; Kushalappa and Bhagwat 2001). In addition, the areas represent contrasting forms of land management, as well as different cultural and religious traditions. While the residents of Meghalaya are currently predominantly Christian, in contrast, the residents of Karnataka are Hindu.

In Meghalaya, the traditional religion in the East and West Khasi Hills districts is Niam Khasi or Seng Khasi, and in the Jaintia Hills district is Niam Tre. According to traditional beliefs of the region, a forest deity resides in the sacred groves. For example, *labasa* is the name for the god of the Mawphlang sacred grove, described by interviewees as taking the form of a tiger or leopard. There is a strong belief that this deity inhabits the sacred grove and offers protection to the community (see Nongkynrih 2007 and Shangpliang 2008). Misra and Rangad (2008) also explain that *Basa* or *Ryngkew Basa* is the sacred grove deity, which is benevolent and provides for the wellbeing of the people in the village. In general, protecting a sacred grove is a form of respect for its deity.

Christian missionaries came to Meghalaya in the 1800s. A Welsh Presbyterian Mission opened a school in the Jaintia Hills in 1852, and other schools in the Khasi region during the same time period (Mishra 2007). These missions and their associated schools provided training in trades including blacksmithing and accounting. Missionaries also recorded the Khasi language using Roman script, creating the first publications in the Khasi language (Syiemlieh 2005; Mishra 2007). Thus, Christian missionaries made a significant contribution to the education system in Meghalaya.

According to Mishra (2007: 2), “Christianity has played a great role in the religious, social, cultural, educational, medical and health, and political life of the community.” However, according to Shangpliang (2008), “the advent of Christianity played an important role in changing the Khasi belief system and their practices of religious rituals.” Generally, Christianity replaced traditional religious beliefs. As of 1991, 65% of Meghalaya was Christian (Chaube 1999). As Syiemlieh (2005: 148) highlights, missionaries “were not attentive to the need to adjust their form of Christianity to the tribal setting.” In Meghalaya, there are no temples associated with the sacred groves, unlike what can be found in other parts of India.

In Meghalaya, in the Khasi language spoken in the East and West Khasi Hills districts, the general term for sacred forest is *Khlaw/Law Kyntang* (sacred forest) or *Law Lyngdoh* (priest’s forest); in the Jaintia language spoken in the Jaintia Hills district, the term is *Khloo Blai* (god’s forest). I interviewed residents of eight communities in Meghalaya about their local sacred groves (Figure 2).

In Kodagu district in southern Karnataka, sacred groves are called *Devarakadu* (god’s forest). In contrast to the situation in Meghalaya, in Karnataka, traditional religious beliefs were maintained and blended with Hinduism. The sacred groves in Kodagu in Karnataka often have a core area that is most sacred, and may contain a shrine. Footwear has to be removed in this area. The most common deities of the sacred groves studied are Ayappa, Bhagavati, and Ishwara. Because Ayappa is considered a hunting god, devotees can give offerings at the Ayappa groves of a small terracotta figure of a dog or horse, animals that are associated with hunting (Srinivas 1952). Sometimes sacrifices of a chicken or another animal may occur in one of the sacred groves; often at a sacred grove for Chamundi or Bhadrakali, fierce goddesses (Srinivas 1952; Kalam 1998; Rodrigues 2007). In Kodagu district southern Karnataka, two languages are spoken—Kannada and Kodava. The Kodavas are the dominant ethnic group in Kodagu, and they speak Kodava (for detailed cultural ethnographies and information about the Kodavas, see Srinivas 1952, Ponappa 1997, and Chinappa 2003). I interviewed residents of seven communities in Karnataka about their local sacred groves (Figure 3).

In the regions studied in both Meghalaya and Karnataka, the sacred groves exist as islands surrounded by a matrix of other landscape uses, primarily farming. In Meghalaya, the dominant land uses are rice paddies and pine plantations. In addition, large-scale land use alteration is occurring, such as coal mining in the Jaintia Hills (Tiwari 1996), and limestone quarrying in the East Khasi Hills. In Kodagu, most groves are surrounded by coffee plantations, called estates.

The sacred groves of Meghalaya are moist tropical and humid subtropical forests (Upadhaya et al. 2003). In Meghalaya, several botanical studies have been conducted in the sacred groves, but no in-depth studies have been conducted on residents’ attitudes towards sacred groves. Jamir and Pandey (2003) measured the plant species diversity of three

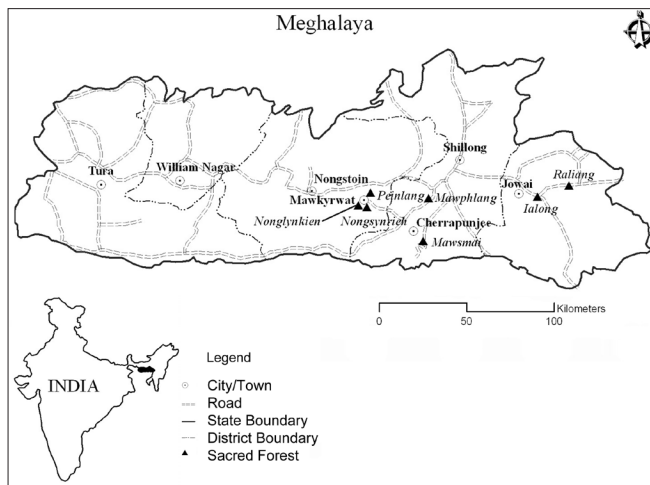


Figure 2
Study sites within Meghalaya

sacred forests and found a total of 395 species, 14% of which were endemic. Tiwari et al. (1998) studied 79 sacred forests in Meghalaya, ranging from 0.01 to 900 ha in size, and found that the species diversity was much higher in sacred forests than in disturbed forests. Upadhaya et al. (2003) studied two sacred forests in Meghalaya and found that the sacred groves had high species richness and represented high diversity forest. Khan et al. (1997) surveyed the botanical literature for Meghalaya and realised that 4% of species (133 species) were found only in sacred groves. Meghalaya is known for its high orchid diversity, although some species have become rare due to collection (Khan et al. 1997).

The Kodagu district of Karnataka is located in the tropical evergreen forests of the Western Ghats (Chandrakanth and Nagaraja 1997). All of the sacred groves studied in Kodagu were of this forest type, except for Devrapura, which was a dry forest. In the Kodagu district of the Western Ghats in southern Karnataka, Bhagwat et al. (2005a) reported that the sacred forests protect threatened tree species not found in protected areas. Also in Kodagu, Boraiah et al. (2003) documented that almost 60% of species that were regenerating within five sacred groves were medicinally important, and 40% of these plants were only found in sacred groves. As in Meghalaya, no in-depth studies have been conducted on residents' attitudes toward sacred groves.

RESULTS

This study found that sacred forests were in many different states of preservation, ranging from minimally disturbed to highly disturbed, including sacred groves that previously existed and are now gone but may still be recognised as sacred space. Sacred groves ranged in size from only a few trees to 122 hectares (Table 1). In Meghalaya, 8 villages were researched, which had 10 groves that had an average size of 38 ha. In Kodagu, 7 villages were studied, which had 21 groves that had an average size of 5.6 ha.

This section presents the results of 156 interviews with

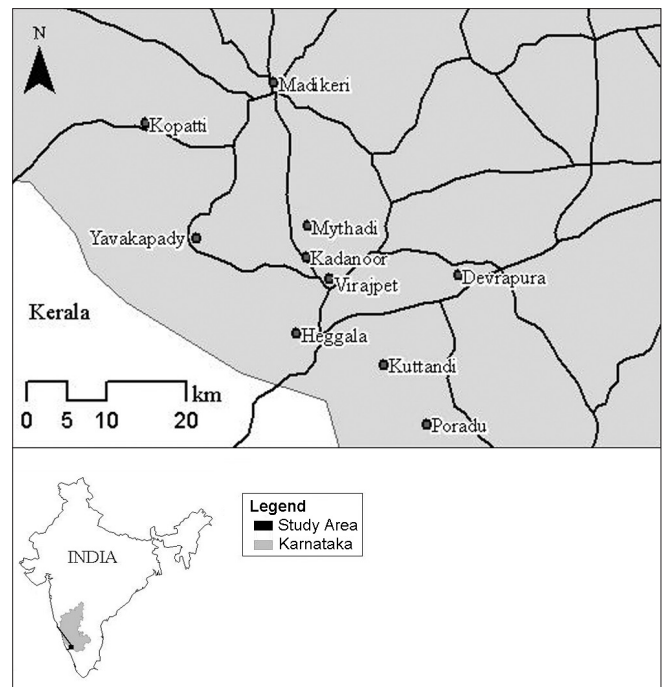


Figure 3
Study sites within Kodagu district, Karnataka

residents of 15 communities in the states of Meghalaya and Karnataka. The results are organised around three major themes—restrictions on the use of sacred grove resources; rituals associated with the sacred groves; and local attitudes toward sacred grove management. Responses from the two study areas in relation to each of the three main organising themes are presented together in each subsection. Results about other aspects of the groves, such as tourism, are not covered in this article (see Ormsby 2012).

Of the residents interviewed in Meghalaya, 61% were Christian, 36% followed traditional religions (of which 11% were Seng Khasi and 25% were Niam Tre), and 3% said they had no religion. In Kodagu, Karnataka, 100% of the residents interviewed were Hindu.

Restrictions on resource use in groves

Interviewees gave numerous responses when posed with open-ended questions, “Are there any taboos on use of natural resources in the grove? What are the specific taboos or actions that are not allowed?” (Figure 4). In both study regions, residents mainly identified that you are not allowed to take anything, and specifically to cut any trees, in a sacred grove. Some respondents (18% in Meghalaya and 29% in Kodagu) identified that hunting is forbidden in the groves. In contrast to other areas in India, both these regions are known for their pork consumption, and residents in general do hunt wildlife for meat. In Meghalaya, respondents said that you cannot harm the plants in the grove. For example, a resident of Nonglynkien said, “you couldn’t even pluck leaves from the grove because the god would punish you.” Respondents in both Meghalaya

Table 1
Sacred groves researched in Meghalaya and Karnataka

Village	Sacred forest or grove studied	Approximate estimated size	Level of disturbance
East Khasi Hills district, Meghalaya: 32 interviews			
Mawmai	<i>Mawlong Syiem</i>	122 ha	Minimal
Mawphlang	<i>Law Lyngdoh</i>	77 ha	Minimal
West Khasi Hills district, Meghalaya: 18 interviews			
Nongsynrieh	<i>Law Lyngdoh-Nonglang</i>	Unknown	High
Nonglyngkien	<i>Law Blei, Sangsli, Law Lyngdoh</i>	Only tree patches	Nearly no grove
Peinlang	<i>Law Lyngdoh or Law Kyntang</i>	4.4 ha	Minimal
Sakwang	<i>Law Lyngdoh Sakwang</i>	Unknown	High
Jaintia Hills district, Meghalaya: 22 interviews			
Ialong	<i>Khloo Blai Phlong</i> <i>Khloo Blai Ryngkaw (Rkaw)</i>	10 ha combined	Moderate Moderate
Raliang	<i>Khloo Langdoh</i> <i>Khloo Puja Kopati</i>	15 ha 0.7 ha	Minimal Moderate
Virajpet taluk, Kodagu district, Karnataka: 67 interviews			
Devrapura (Hebbale)	<i>Ayyappa devarakadu</i> <i>Betekurubara devarakadu</i>	16.6 ha 15.9 ha	High Minimal
Heggala	<i>Ayappa/Ishwara</i> <i>Bhagavathi temple</i> <i>Balogodu- Kandimaki</i>	41.7 ha 2 ha unknown	Moderate High Minimal
Kadanoor	<i>Ayyappa</i> <i>Bhagavathi temple</i>	10 ha 1 ha	Moderate (variable) High
Kuttandi	<i>Botekaramba</i> <i>Kadenkad</i> <i>Karekund</i> <i>Kundachappa</i> <i>Mahadevara</i>	0.04 ha 1.6 ha >3 ha 1.4 ha 1 ha	High High Moderate High Moderate
Mythadi	<i>Ayappa temple</i> <i>Chamundi/Bhadrakali</i> <i>Battemaki</i> <i>Koorvale</i> <i>Aiyappa (Malamati)</i>	0.6 ha 0.6 ha 3.6 ha 3 ha 0.8 ha	High Moderate Moderate Minimal High
Poradu	<i>Kalath Bhagavathi</i> <i>Kikut Aiyappa</i> <i>Poonya Bhagavathi</i>	0.5 ha 1 ha 7 ha	High Moderate Minimal
Madikeri taluk, Kodagu district, Karnataka: 17 interviews			
Yavakapady	<i>Pannangalathamme</i>	0.8 ha	Moderate

and Karnataka said you should not behave inappropriately in the grove, such as smoking, drinking alcohol, going on a date, littering, or going to the toilet, all of which are reported as dirtying the grove.

Interviewees recounted stories of transgressors who had taken resources from a sacred grove and then bad things happened to them. Of the residents interviewed in Mawphlang, 33% recounted a story of when Indian Army personnel came and broke the taboo against taking wood from the sacred forest. According to the residents interviewed, the Army personnel became ill until they returned the wood and sought the prayers of the local traditional priest (*lyngdoh*) and were cured. At the Poradu sacred grove in Kodagu district, two different residents told stories of how someone had come to take bark from a tree within the sacred grove and had suffered health

problems as a result.

While acknowledging restrictions on sacred grove resource use, it became clear in interviews that some resource collection is occurring, including firewood, soil, and leaf litter. Mawphlang is the most well-known sacred forest in Meghalaya, both within the region and internationally. The Mawphlang sacred grove contains many orchids. There is a threat from outside collectors who could try to take plants out of the sacred grove, which may be why this forbidden action was mentioned in Meghalaya but not by respondents in Kodagu. Many residents of Shillong, the capital of Meghalaya, travel the hour to Mawphlang to have a picnic in the grassland on the edge of the sacred forest. Because Mawphlang is such a popular destination, there is pressure to use firewood from the sacred grove to cook picnic food.

Of the Kodagu residents interviewed, 32% mentioned soil collection whereas only 4% of the Meghalaya interviewees identified this activity as forbidden. Kodagu district is well-known for its coffee estates and many groves are entirely surrounded, and in some cases encroached upon, by coffee. There is a high demand to use the rich soil and leaf litter from the sacred groves for coffee nurseries and rice paddy fertilizer. In most cases, soil extraction and leaf collection are not allowed in the groves, except perhaps in small quantities for personal use.

Residents were asked, “What would happen to someone if they violated the taboo on the use of natural resources from the sacred grove?” In both research areas, interviewees believed that there would be consequences in the form of punishment from the forest deity if they were to take resources out of the sacred grove—identified by 51% of the residents surveyed in Meghalaya and 26% in Karnataka. Usually, the type of punishment was sickness or even death to the person who broke the taboo or a member of their family. But, the type of sickness or consequence varied by site. For example, in Jaintia Hills, Meghalaya, respondents said that transgressors would have a seizure or could freeze in place. In East Khasi Hills, Meghalaya, particularly at the Mawsmat and Mawphlang sacred groves, many respondents said that if you took something from the sacred grove or broke a rule, “your head would turn,” which interviewees further explained to mean “the head is twisted back, you can’t eat or talk, like the side of the face is being pulled, and eventually the person will die if a pardon is not asked [from the forest deity]”.

Rituals and festivals of the groves

In Karnataka, all interviewees were Hindu and had some knowledge of the festivals performed in association with the sacred groves. In contrast, in Meghalaya there were different religious belief systems and a range of knowledge and frequency of rituals associated with the groves.

In Kodagu district, Karnataka, all communities surveyed near groves still perform annual festivals associated with the sacred grove. These festivals range from one to nine days in length. Sacred grove festivals are celebrations for the god that resides in the sacred forest (or former sacred grove) and may be conducted at a temple, often located inside the sacred grove, and/or in the sacred grove itself when there is no temple structure. These festivals are a time when the community renews its connection to the sacred grove and the god. Festivals often involve following strict rules for multiple days before the event, including not eating meat, hunting, or cutting plants. Women who are menstruating are not supposed to attend the festivals. The festival usually has many aspects, which may include taking a statue of the god out of the temple, usually only once per year at this time only, typically by a Brahmin priest, and taking the god to a nearby water source where the god is ritually washed. All festivals normally include several *pujas*—ceremonies where offerings are given and blessings are sought. Interestingly, some of the festivals involve multiple sacred groves in one community, such as at Mythadi in Kodagu.

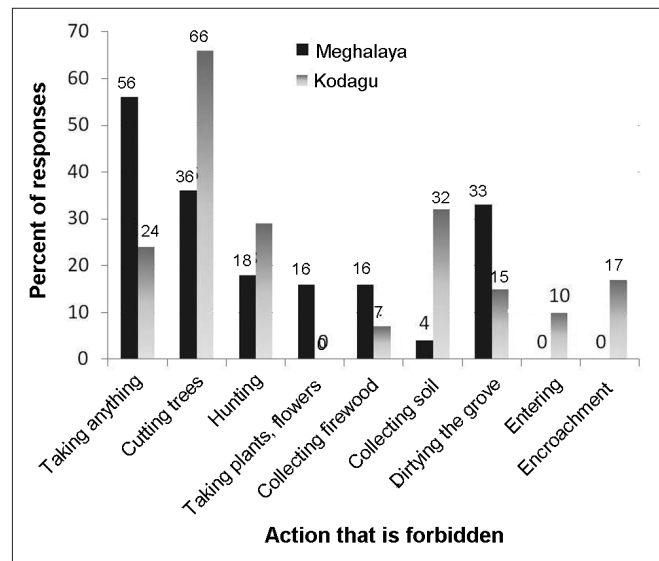


Figure 4
Activities that residents identified as forbidden in the local sacred grove

In Meghalaya in the past, rituals for traditional religions were performed at sacred groves every year or less frequently. Some ceremonies involved sacrificing an animal for the forest deity. With changes in religious beliefs in Meghalaya, several rituals at numerous sacred groves are no longer performed. For example, residents of four communities studied in Meghalaya shared the last time rituals were conducted—in Mawkyrwat over 60 years ago, in Mawsmat 80 years ago, in Nonglyngkien over 25 years ago, and in Sakwang about 50 years ago. Although over half of the Mawphlang residents interviewed said that rituals are still performed, one Mawphlang resident said, “There are no ceremonies now because of Christianity.” As one female resident of Mawphlang said “Those who have become Christians don’t believe in *labasa*.” Some Mawphlang residents said that if there is sickness or an epidemic, then the rituals will be performed in order to get help from the forest god.

Three of the sites visited in West Khasi Hills, Meghalaya, were former sacred groves—Nongsynrih, Nonglyngkien, and Sakwang. As a resident of Nonglyngkien explained, once the sacredness was gone, they cut all the trees and sold them. A different resident of Nonglyngkien said, “because of Christianity, they don’t do the ceremonies anymore.” One resident of Sakwang said the forest is no longer sacred, “We worship God in church, so we don’t have to worship in the forest anymore.” A resident of the town of Mawkyrwat recounted that, “after conversion [to Christianity], the old belief was not effective anymore. Therefore, in the 1960s, they destroyed all of the forest... An auction was declared. All the villagers went into the forest and chose the trees they wanted to buy.” Similar practices continue today as the management designation of sacred groves is changed to less strict forest types, such as community forests that can be occasionally harvested (see Ormsby 2011). This may not be solely because of religious reasons, but rather due to economic pressures to

use the timber in the sacred groves.

In Meghalaya, rituals are still performed at the Peinlang sacred grove in West Khasi Hills and at the Ialong and Raliang sacred groves in Jaintia Hills with differing frequencies. Every resident interviewed in Ialong confirmed that ceremonies were performed on a regular basis—annually at one sacred grove, and every 15 to 20 years at another sacred grove. Peinlang represents an interesting example of how different religious beliefs can be compatible. As one Catholic resident of Peinlang said about the local grove (managed by Seng Khasis), “It is sacred and beautifies the area; if it is gone the next generation won’t be able to see it. We need the forest. It has sentimental value since our ancestors saved it; it is like a gift from them; we get fresh air.” This interviewee explained that although he knows ceremonies are still being performed at the sacred grove, he does not attend the rituals because he is Catholic.

In Meghalaya, there was a significant correlation between the knowledge of rituals associated with the sacred grove and gender as well as religious affiliation. Residents who still practice traditional belief systems (Seng Khasi or Niam Tre) were much more likely to be aware of the ceremonies associated with the groves ($\chi^2_2 = 23.601$, $P < 0.001$). In addition, male residents were more likely to know about the ceremonies ($\chi^2_2 = 4.73$, $P = 0.005$). Typically it is male elders associated with the Lyngdoh (traditional priests) clan who perform the ceremonies.

Residents’ attitudes toward grove management practices

The unique management and ownership of the sacred groves is one significant reason that they are so special. In most cases, the sacred groves are owned and managed by local communities, and sometimes by one or more families or clans (see Ormsby 2011).

The management of sacred groves varies by region and locality. In Meghalaya, the management of sacred groves is usually undertaken by the headman of a community or by a dorbar (also spelled durbar), which is a committee of community members or male elders. In some cases, a specific clan is in charge of managing the sacred grove and associated rituals. In addition, the local priest plays a key role in forest management and ceremonies. Government agencies are not involved in grove management in Meghalaya.

The sacred grove management arrangement in Kodagu district of Karnataka is unusual in India because the sacred groves are overseen by the government Forest Department, although their actual management is by community temple committees. When I asked Kodagu residents “Who manages the grove?” 62% responded that it is the temple management committee and only 13% said the Forest Department. There are advantages and disadvantages to having sacred groves legally recognised. An advantage in Kodagu District is that many of the sacred groves have been surveyed by the Forest Department, so their size and locations are known. Forest Department surveys were reported to have been conducted

in 1873, 1905, and 1985, although not all sacred groves have been surveyed or demarcated with stone boundary markers (Pouchepadass 1993). Those sacred groves that have been surveyed are listed on an official Forest Department survey document.

Residents were asked the open-ended question, “What do you think should happen to the grove in the future?” In both regions, the majority of interviewees wanted the sacred groves to remain the same (Figure 5). As one resident of Mawphlang said, he “wants the grove to remain as it is forever so my children can see it.” Likely because the sacred groves in Kodagu are surrounded by coffee plantations, no residents mentioned future expansion of the groves—proposed actions focused on planting to thicken the groves—whereas in Meghalaya, residents still had hope for expansion of the sacred groves. As one Mythadi, Karnataka resident said, “What is there has to be protected and improved, through more planting and protecting the existing grove.”

Residents were asked “Do you think the sacred forest should be expanded?” In Meghalaya, 65% of the respondents said they did think the sacred grove should be expanded, and only 30% of the interviewees said it would not be possible to expand. In contrast, many Kodagu residents said it would not be possible to expand the sacred groves because there is no area for expansion. Only 22% of the interviewees said yes, the sacred grove should be expanded, whereas 40% of the residents surveyed said the sacred grove could not be expanded because there is no land available. One person who supported protection of the sacred grove said that areas of the sacred grove that had been encroached should be returned to the sacred grove. Most Kodagu residents said that there are fewer or no animals anymore in the sacred groves primarily because of the conversion of nearby forests to coffee.

An overview of the comparative results from both study regions is presented in Table 2.

DISCUSSION

Despite the differences in the religion and history of the two study regions, there are several similarities in the status of sacred groves. Communities in both regions still generally uphold restrictions limiting the resource use in sacred groves, and rituals are still being conducted in many of the sacred groves; however, ceremonies associated with sacred groves in Karnataka are held on a much more regular basis than in Meghalaya. The grove management approaches through community committees or individual families in Meghalaya are quite different than the temple management committee collaboration with the Forest Department in Kodagu, Karnataka. Each of the thematic areas of research—the use of sacred grove resources, sacred grove rituals, and sacred grove management—is discussed in this section, in relation to larger issues of sacred groves research in India.

Challenges over sacred grove resource use

My research showed that there is an ongoing demand to use the natural resources within sacred groves, ranging from the forests' trees for timber or firewood to the land and soil within the forest. This study found that in Meghalaya, the main sacred grove resource desired for use was firewood, whereas in Kodagu it was soil and leaf litter, associated with demands from coffee plantations. The report of one resident interviewed in West Khasi Hills about the auctioning of timber from a sacred grove directly corresponds with Gadgil's observation (1998:226) that "in many parts of north-east India sacred groves were liquidated in the 1950s following widespread penetration of market forces and conversion to Christianity."

I observed that there has been encroachment on numerous sacred groves in Kodagu to grow coffee. Coffee was introduced to the state of Karnataka, and in particular to Kodagu district, by the British in the 1800s (Ambinakudige and Choi 2009). Over time, much of the previously forested private land has been converted to coffee estates (Chandrakanth et al. 2004). In fact, "from 1977 to 1997 there was a 30% loss of forest cover in Kodagu while the area under coffee cultivation doubled" (Garcia et al. 2010: 480). Furthermore, an analysis of land use in Kodagu found that "areas under coffee cultivation had increased by 10 per cent between 1991 and 2002," mainly from conversion of private forests to coffee (Ambinakudige and Choi 2009: 331). Kodagu currently produces one-third of the coffee exported from India (Garcia et al. 2010).

In southern Karnataka, the introduction of coffee to Kodagu generated economic pressures to convert land from forest cover to cash crops. Also, over time, the pressure to use the resources in the sacred groves has continued to rise as the natural area outside the sacred groves dwindles and as there is a lack of available timber outside the groves. Kodagu is approximately 6 hours from Bangalore, a major urban centre. This relative proximity affects coffee markets as well as relocation of younger residents to Bangalore for education and employment opportunities. Many youth are migrating to urban areas for jobs and may no longer have contact with elders who know the stories and meaning behind the sacred groves, as well as rules about restrictions on resource use. According to

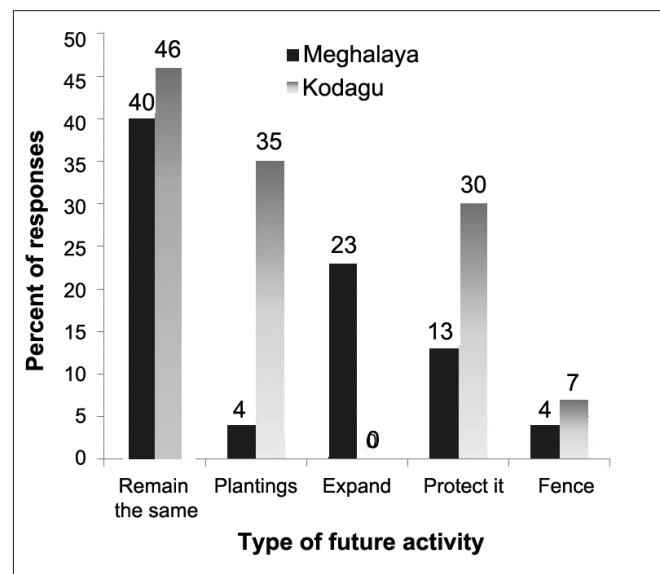


Figure 5
Responses to "What do you think should happen to the grove in the future?"

Chandrakanth et al. (2004), sacred forests in the Kodagu region of south India are disappearing due to commercial agriculture, changing beliefs, and weak property rights systems. Younger generations are losing interest in the sacred grove traditions. Kalam (1996) attributes increasing urbanisation in the Kodagu region to a loss of attention to traditional religious and cultural values, often leading to the desecration of sacred groves. No clear link in attitudes toward groves to the age of interviewee was found, but further studies might investigate this topic. I did meet residents who had moved to Bangalore and had made the effort to return to their home community for the annual festival.

Effects of changing belief systems

Through a statistical analysis of the interview results, this study found that gender and religious beliefs correlated with the knowledge of rituals associated with the sacred forests

Table 2
Comparison of results from the two study regions

	Meghalaya (NE India)	Kodagu, Karnataka (SW India)
Biodiversity hotspot region	Indo-Burma	Western Ghats
Number of interviews conducted	72	84
Religions	Christianity, traditional religions (Niam Khasi, Niam Tre)	Hinduism
Languages	Khasi, Jaintia	Kannada, Kodava
Main natural resource pressures	Farming, coal mining (Jaintia Hills)	Coffee plantations
Extent of allowed resource use, e.g., hunting	Limited use; 18% of respondents identified hunting as forbidden	Limited use; 29% of respondents identified hunting as forbidden
Respondents who said the grove deity would punish if grove taboos were violated	51%	26%
Festivals conducted in association with the grove?	Variable, with declining frequency	Typically once a year
Management structure	Individual families or community committees	Temple management committees and Forest Department
Should the sacred forest be expanded?	Yes: 65%	Yes: 22%

in Meghalaya. Residents of Meghalaya who still practice traditional religions were statistically more aware of sacred grove ceremonies, as were males. In Karnataka, rituals are still regularly practiced at all the groves studied, and respondents were aware of the ceremonies.

In their study in Meghalaya, Tiwari et al. (1998) found a correlation between the level of disturbance and the performance of traditional rituals—in undisturbed sacred groves like Mawphlang and Raliang, rituals were still performed as in the past, but in communities with disturbed groves, rituals were no longer performed. Similarly, Khiewtam and Ramakrishnan (1989) reported that rituals and ceremonies have been discontinued in many sacred groves in the Khasi Hills, Meghalaya.

Throughout India, changes in religious traditions and belief systems have led to a weakening of the protection of sacred forests. In some cases, the sacred forests that were established for older folk deities have been subsumed by Hinduism, yet the groves are still maintained while Hindu gods are worshipped. Sanskritisation, a term used to refer to the replacement of local folk deities with Hindu deities in the sacred groves, often results in temples being built within forests (Srinivas 1952; Gadgil and Chandran 1992; Kalam 1996, 1998; Bhagwat and Rutte 2006; Kent 2009). As Tomalin (2004: 289) describes Sanskritisation, “regional deities become identified with the pan-Indian Gods and the groves are cleared to make way for temples.” The removal or use of wood from sacred groves for religious purposes is allowed (Kalam 1996; Tiwari et al. 1998).

In Meghalaya, tribal religion and culture has been largely replaced by Christianity. Tiwari et al. (1998) interviewed residents near 79 sacred groves, and 95% of respondents attributed degradation of the sacred grove to this change in religious beliefs. While Christianity may be compatible with sacred groves in some parts of India, in Meghalaya, generally the conversion to Christianity has led to a lessening of beliefs in traditional religion, including beliefs in the gods of sacred groves. In contrast, in other parts of India, specifically the Santals of West Bengal, retained their indigenous beliefs and heritage while superimposing Christianity (Raj 2007). As Raj (2007: 248) explains, Catholic missionaries adopted an approach of indigenisation or inculturation and “sought to relate Christian faith to the indigenous religiocultural context by recasting Christian ideas and practices in native cultural and religious categories and institutions.” Perhaps a similar approach could be pursued in Meghalaya. However, it is important not to generalise the experience of religious traditions and historical experience in one part of India to the whole of India.

In order to counter the current threats posed to some sacred forests due to religious and cultural changes as well as from natural resource pressures, a renewal of community traditions could be beneficial, as has also been proposed by Kushalappa and Bhagwat (2001) and Gowloog (2009). This may come through revival of past ceremonies related to a sacred grove, as well as through awareness campaigns and education programs highlighting the ecological and spiritual benefits of the forests

and reinforcing rules about the use of resources (Chandrakanth and Nagaraja 1997; Chandrashekara and Sankar 1998; Wild and McLeod 2008). The approach needs to be tailored to the local context. For example, my research found that at some sites in Meghalaya it had been many years since rituals were performed and residents were reluctant to conduct them since they had forgotten how they are performed and were worried about conducting the ceremonies improperly.

In several cases in Karnataka, larger groves have been reduced in size, with a shift in focus from the sacred grove itself to a temple within the sacred grove (see Burman 1995; Chandran and Gadgil 1998). The risk of this transition is that it leads to a loss of forest cover in the sacred grove. At least one local organisation has been working to highlight this risk. The Kodagu Model Forest Trust has been involved in educational programs about sacred groves for many years, for example, producing posters about the local sacred groves and the need for their preservation, targeting the younger generation. This could be one element of a larger educational program, at both the school and community levels. The National Museum on Mankind, based in Bhopal, has sponsored a number of awareness-raising initiatives in relation to sacred groves. In 1999, they developed a travelling exhibition about sacred groves that toured India, as well as a sacred grove festival in 2000 with representatives from 15 states of India. The sacred grove celebration was held again in 2007, with the Kodagu Model Forest Trust and the other network members involved (Wild and McLeod 2008). However, despite these efforts, in 2010 when I conducted a lecture for a group of 50 students aged 12 who were visiting the World Wide Fund for Nature (WWF) office in Delhi, none of the students had heard of a sacred grove, despite the fact that there are thousands in India. Therefore, it seems that a comprehensive, nationwide awareness campaign related to the conservation of sacred groves is still needed on a regular basis. Working with local community leaders, whether religious or from non-governmental organisations, can help build alliances and support for future sacred grove conservation.

Changing practices of grove management

My study in Meghalaya and Karnataka found that residents of both study regions want the sacred groves to remain the same in the future. Residents recognised that expansion of the sacred groves may be difficult due to existing uses of land immediately adjacent to the sacred groves, particularly in the Kodagu region of Karnataka. I observed that many of the sacred groves in Kodagu had been encroached by coffee around their borders, and that coffee seedlings are present in the understory of many sacred groves, likely through natural seed dispersal.

One interesting trend at the communities of Ialong and Raliang in Jaintia Hills district, Meghalaya, and at Kadanoor, Karnataka, is that they have fenced, or are in the process of fencing, their small sacred groves. As one resident of Raliang said, “There are more and more people here moving closer and closer to the forest – they may even cut from the edge – this is

why we are trying to fence the forests.” In Kodagu, the Forest Department has dug trenches around some sacred groves, which can be an effective deterrent to keep out cattle and to provide a clear boundary to discourage encroachment. Fencing can have negative impacts on the movement of wildlife, but could deter human encroachment in the sacred groves.

CONCLUSION

The results presented in this article are an indication of the status of sacred groves in two very different states of India. They are also a comparison of the opinions of residents of the communities in which the sacred groves are located, to show the complexity of issues relating to the future of these sacred groves. The sacred groves of Meghalaya and southern Karnataka represent the long-held tradition of community management of natural areas, which is currently under pressure for a variety of reasons. Despite the difference in religious heritage and management structures in the two study areas, the sacred groves in these two different regions still persist. Authors who have written about the sacred groves of India have remarked that cultural change over time has led to the weakening of the protection of, and the traditions associated with, the sacred forests. Religious and cultural change is not the only reason for the decrease in the size or respect for the sacred groves of Meghalaya and Karnataka—economic forces should not be overlooked.

Due to time and logistical limitations, not every sacred grove in the study regions of Meghalaya and Karnataka could be visited. Comprehensive studies of sacred groves throughout India are still needed. Khan et al. (1997) advocate for an inventory of the number, size, and distribution of sacred groves as well as systematic botanical surveys of sacred groves, predicting that this would lead to the discovery of new species. In addition, Khan et al. (1997) recommend that sacred groves should be included within the legal protected area network. However, in Kodagu district, Karnataka, the formal involvement of government agencies has been complicated and confusing to residents. As Dudley et al. (2009:568) noted, “Bringing a sacred natural site into a national protected-area system can increase protection for the site, but may compromise some of its spiritual values or even its conservation values.” Chandrakanth et al. (2004) noted that the legal ownership of many sacred groves is uncertain, and argued that sacred groves should not be allowed to be classified as state reserve forests. This would take management control away from community members. Furthermore, government ownership could cause alienation of local people from their sacred groves—a sentiment some residents expressed during interviews in Kodagu, Karnataka. Local residents must continue to be involved in sacred forest management (Bhagwat et al. 2005a; Wild and McLeod 2008). If local management systems are supported, the community tradition of protecting sacred forests can provide a model way of achieving landscape-level conservation that is implemented and maintained at a local level.

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REFERENCES

- Ambinakudige, S. and J. Choi. 2009. Global coffee market influence on land-use and land-cover change in the Western Ghats of India. *Land Degradation and Development* 20: 327–335.
- Babbie, E. 1990. *Survey research methods*. Belmont, CA: Wadsworth Publishing Company.
- Bernard, H.R. 2011. *Research methods in anthropology: Qualitative and quantitative approaches*. Fifth edition. Lanham, MD: AltaMira Press.
- Bhagwat, S.A. and C. Rutte. 2006. Sacred groves: Potential for biodiversity management. *Frontiers in Ecology and the Environment* 4: 519–524.
- Bhagwat, S.A., C.G. Kushalappa, P.H. Williams, and N.D. Brown. 2005a. The role of informal protected areas in maintaining biodiversity in the Western Ghats of India. *Ecology and Society* 10 (1): 8.
- Bhagwat, S.A., C.G. Kushalappa, P.H. Williams, and N.D. Brown. 2005b. A landscape approach to biodiversity conservation of sacred groves in the Western Ghats of India. *Conservation Biology* 19: 1853–1862.
- Boraiah, K.T., R. Vasudeva, S.A. Bhagwat, and C.G. Kushalappa. 2003. Do informally managed sacred groves have higher richness and regeneration of medicinal plants than state-managed reserve forests? *Current Science* 84: 804–808.
- Burman, R.J.J. 1995. The dynamics of sacred groves. *Journal of Human Ecology* 6: 245–254.
- Chandrakanth, M.G., M.G. Bhat, and M.S. Accavva. 2004. Socio-economic changes and sacred groves in south India: Protecting a community-based resource management institution. *Natural Resources Forum* 28: 102–111.
- Chandrakanth, M.G. and M.G. Nagaraja. 1997. Existence value of Kodagu sacred groves: Implications for policy. In: *The challenge of the balance: Environmental economics in India* (ed. Agarwal, A.). Pp. 217–224. New Delhi: Centre for Science and Environment.
- Chandran, M.D.S. and M. Gadgil. 1998. Sacred groves and sacred trees of Uttara Kannada. In: *Lifestyle and ecology* (ed. Saraswati, B.). Pp. 85–138. New Delhi: D.K. Printworld.
- Chandran, M.D.S. and J.D. Hughes. 1997. The sacred groves of south India: Ecology, traditional communities and religious change. *Social Compass* 44: 413–428.
- Chandrashekhara, U.M. and S. Sankar. 1998. Ecology and management of sacred groves in Kerala, India. *Forest Ecology and Management* 112: 165–177.
- Chaubey, S.K. 1999. The scheduled tribes and Christianity in India. *Economic and Political Weekly* 34 (9): 524–526.
- Chinappa, N. 2003. *Pattole Palame: Kodava culture-folksongs and traditions*. New Delhi: Rupa Co.
- Creswell, J.W. 2003. *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage Publications.
- DeWalt, K.M. and B.R. DeWalt. 2011. *Participant observation: A guide for fieldworkers*. New York, NY: AltaMira Press.
- Dudley, N., L. Higgins-Zogib, and S. Mansourian. 2009. The links between protected areas, faiths, and sacred natural sites. *Conservation Biology* 23: 568–577.
- Gadgil, M. 1998. Grassroots conservation practices: Revitalizing the traditions.

- In: Communities and conservation: Natural resource management in South and Central Asia (eds. Kothari, A., N. Pathak, R.V. Anuradha, and B. Taneja). Pp. 219–238. London: Sage Publications.
- Gadgil, M., and M.D.S. Chandran. 1992. Sacred groves. In: Indigenous vision: Peoples of India, attitudes to the environment (ed. Sen, G.). Pp. 183–187. New Delhi: Sage Publications.
- Gadgil, M. and V.D. Vartak. 1976. The sacred groves of Western Ghats in India. *Economic Botany* 30: 152–160.
- Garcia, C., S. Bhagwat, J. Ghazoul, C. Nath, K. Nanaya, C. Kushalappa, Y. Raghuramulu, R. Nasi, and P. Vaast. 2010. Biodiversity conservation in agricultural landscapes: Challenges and opportunities of coffee agroforests in the Western Ghats, India. *Conservation Biology* 24: 479–488.
- Gowloog, R.R. 2009. The preservation of indigenous cultural heritage of the Khasis of Meghalaya: Some issues. *Man and Society: A Journal of North East Studies* VI: 95–104.
- Jamir, S.A. and H.N. Pandey. 2003. Vascular plant diversity in the sacred groves of Jaintia Hills in northeast India. *Biodiversity and Conservation* 12: 1497–1510.
- Kalam, M.A. 1996. Sacred groves in Kodagu District of Karnataka (South India): A socio-historical study. *Pondy Papers in Social Sciences* 21. Pondicherry: Institut Français de Pondicherry.
- Kalam, M.A. 1998. Sacred groves in Coorg, Karnataka. In: *The social construction of Indian forests* (ed. Jeffery, R.). Pp. 41–54. Edinburgh: Centre for South Asian Studies.
- Kent, E.F. 2009. Sacred groves and local gods: Religion and environmentalism in South India. *Worldviews* 13: 1–39.
- Khan, M.L., S. Menon, and K.S. Bawa. 1997. Effectiveness of the protected area network in biodiversity conservation: A case-study of Meghalaya state. *Biodiversity and Conservation* 6: 853–868.
- Khiewtam, R.S. and P.S. Ramakrishnan. 1989. Socio-cultural studies of the sacred groves of Cherrapunji and adjoining areas in North-Eastern India. *Man in India* 69: 64–71.
- Kushalappa, C.G. and S. Bhagwat. 2001. Sacred groves: Biodiversity, threats and conservation. In: *Forest genetic resources: Status, threats, and conservation strategies* (eds. Shaanker, U.R., K.N. Ganeshaiah, and K.S. Bawa). Pp. 21–29. Oxford: IBH Publishing.
- Lebbie, A.R. and M.S. Freudenberger. 1996. *Sacred groves in Africa: Forest patches in transition*. In: Forest patches in tropical landscapes (eds. Schelhas, J. and R. Greenberg). Pp. 300–324. Washington, DC: Island Press.
- Malhotra, K.C., Y. Gokhale, S. Chatterjee, and S. Srivastava. 2007. *Sacred groves in India*. New Delhi: Aryan Books International.
- Mishra, S.K. 2007. Socio-economic exclusion of different religious communities in Meghalaya. <http://ssrn.com/abstract=992122>. Accessed on June 26, 2013.
- Misra, P.K. and A. Rangad. 2008. Sacred grove, Khasi society and worldview. *The NEHU Journal* VI (1 and 2): 19–54.
- Morgan, D.L. 1997. *Focus groups as qualitative research*. Thousand Oaks, CA: Sage Publications.
- Myers, N., R.A. Mittermeier, C.G. Mittermeier, G.A. da Fonseca, and J. Kent. 2000. Biodiversity hotspots for conservation priorities. *Nature* 403: 853–858.
- Nongkynrih, K.S. 2007. *Around the hearth: Khasi legends*. NY: Penguin Books.
- Ntiemoa-Baidu, Y. 1995. *Indigenous vs. introduced biodiversity conservation strategies: The case of protected area systems in Ghana*. Washington, DC: WWF Biodiversity Support Program Volume 1. African Biodiversity Series.
- Ormsby, A.A. 2012. Perceptions of tourism at sacred groves in Ghana and India. *Recreation and Society in Africa, Asia and Latin America* 3 (1). <http://gir.uoguelph.ca/index.php/rasaala/article/view/2213>. Accessed on June 26, 2013.
- Ormsby, A.A. 2011. The impacts of global and national policy on the management and conversation of sacred groves of India. *Human Ecology* 39 (6): 783–793.
- Ormsby, A.A. and S.A. Bhagwat. 2010. Sacred forests of India: A strong tradition of community-based natural resource management. *Environmental Conservation* 37: 320–326.
- Ormsby, A. and C. Edelman. 2010. Tafi Atome Monkey Sanctuary, Ghana: Community-based ecotourism at a sacred site. In: *Sacred natural sites: Conserving nature and culture* (eds. Verschuuren, B., R. Wild, J. McNeely, and G. Oviedo). Pp. 233–243. London: Earthscan.
- Ponappa, K.C. 1997. *A study of the origins of Coorgs*. Chettalli, Kodagu: K.C. Ponappa.
- Pouchepadass, J. 1993. *The ecological history of the Western Ghats in the modern period, a preliminary survey*. Pondicherry: Institut Français de Pondicherry.
- Raj, S.J. 2007. The Santal sacred grove and Catholic inculturation. *Journal of Ecumenical Studies* 42 (2): 243–252.
- Rodrigues, H. 2007. *Introducing Hinduism*. New York, NY: Routledge.
- Shangpliang, R. 2008. The place of nature in the culture of the Khasis. *Man in India* 88 (4): 547–558.
- Sheridan, M.J. and C. Nyamweru. eds. 2007. *African sacred groves: Ecological dynamics and social change*. Athens, OH: Ohio University Press.
- Srinivas, M.N. 1952. *Religion and society among the Coorgs of South India*. Oxford: Clarendon Press.
- Syiemlieh, D.R. 2005. Christian missions and tribes in the hills of North-East India. In: *Between ethnography and fiction: Verrier Elwin and the tribal question in India* (eds. Subba, T.B. and S. Som). Pp. 147–156. New Delhi: Orient Longman.
- Tiwari, B.K. 1996. Impact of coal mining on ecosystem health in Jaintia Hills, Meghalaya. In: *Conservation and management of biological resources in Himalaya* (eds. Ramakrishnan, P.S., A.N. Purohit, K.G. Saxena, K.S. Rao, and R.K. Maikhuri). Pp. 466–475. New Delhi: Oxford and IBH Publishing Co. Pvt. Ltd.
- Tiwari, B.K., S.K. Barik, and R.S. Tripathi. 1998. Biodiversity value, status, and strategies for conservation of sacred groves of Meghalaya, India. *Ecosystem Health* 4: 20–32.
- Tomalin, E. 2004. Bio-divinity and biodiversity: Perspectives on religion and environmental conservation in India. *Numen* 51: 265–295.
- Upadhaya, K., H.N. Pandey, P.S. Law, and R.S. Tripathi. 2003. Tree diversity in sacred groves of the Jaintia hills in Meghalaya, northeast India. *Biodiversity and Conservation* 12: 583–597.
- Upadhaya, K., S.K. Barik, H.N. Pandey, and O.P. Tripathi. 2008. Response of woody species to anthropogenic disturbances in sacred forests of northeast India. *International Journal of Ecology and Environmental Sciences* 34: 245–257.
- Weiss, R.S. 1994. *Learning from strangers: The art and method of qualitative interview studies*. New York, NY: The Free Press.
- Wild, R.W. and C.M. McLeod (eds.) 2008. *Sacred natural sites: guidelines for protected area managers*. Gland: IUCN.