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A Study of Local Attitudes and Perceptions of Sacred Groves Among Village Communities in East Khasi Hills, Meghalaya, India

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ABSTRACT

Sacred groves are a traditional form of community forest management and conservation linked with the beliefs, attitudes and perceptions of the communities under whose care they exist. 'law Ryngkew Lum Swer and 'law Lyngdoh / Mawphlang sacred grove are two sacred groves found in Meghalaya, India. Understanding the attitudes and perceptions of the communities that manage them would grant a better understanding of how the sacred groves are viewed and administered. To this end, a structured questionnaire was distributed at the village ofSwer, near'law Ryngkew Lum Swer and the villages of Dongiewrim and Nongrum, located adjacent to 'law Lyngdoh /Mawphlang sacred grove. A structured questionnaire was distributed and 272 were returned duly filled. Cronbach's Alpha Reliability Test for ordinal data obtained via the implementation of a 5 point Likert Scale tested above 0.7 for both sites indicating high data reliability. Most respondents were aware of the sacred grove in their vicinity, but did not to participate in religious ceremonies associated with sacred groves citing various reasons including gender and religious belief. Respondents stated that rituals have not been conducted at Mawphlang for several decades while at Swer they are still conducted. Notable percentages of respondents at both sites still believe sacred groves to be the dwelling place of spirits who would punish violators. A greater percentage at Mawphlang viewed sacred groves as a source of income and employment than at Swer. This may be because Mawphlang sacred grove is a popular commercial tourist attraction while law Ryngkew Lum Swer is not. The paper highlights the importance of sacred groves in the perceptions of local communities and their view regarding the need to conserve them.

Keywords: Community forest management, Natural resource management, conservation, human attitudes

INTRODUCTION

Among the various traditional methods of conservation that are community oriented, sacred groves may be regarded as significant in that they exemplify the social, religious and cultural value of biodiversity (Ormsby and Bhagwat 2010). Sacred groves are regarded as an example of a traditional approach to conservation that is carried out by local communities due to their religious and cultural perceptions and beliefs (Khan et al. 2008). In several countries, sacred groves are playing an important role in biodiversity conservation due to the regulations and prohibitions that have been instituted to protect such sites (Bhagwat and Rutte 2006). However, since sacred groves are given protection due to their religious/spiritual and cultural importance or role as sites dedicated to, or the abodes of deities in local belief (Gadgil and Vartak 1976, Khan et al. 2008, Ormsby 2013), local views and perceptions play a critical role in their continued protection and preservation. Impact of changes in local belief systems and values attached to sacred groves on changing biodiversity and attitude towards managing them have been discussed by many workers (Tiwari et al. 1998a, Ormsby and Bhagwat 2010, Ormsby 2013).

Sacred groves may be regarded as aggregations of forested areas that are protected because of their religious importance (Chandrakanth and Romm 1991). Many sacred groves are believed to be the dwelling places of deities or spirits or sites dedicated to them as documented in Ghana (Dorm-Adzobu et al. 1991, Sarfo-Mensah et al. 2010) and in various parts of India (Tiwari et al. 1998a, Ormsby 2013, Gupta and Sharma 2014, Pala et al. 2014, Rawat 2014). Others such as those in Morocco shelter the tombs of religious saints (Deil et al. 2005) or grow

around places of worship such as churches(Cardelus et al. 2013). Sometimes the sacredness of the forest may be attached to structures (natural or man-made) that are regarded as being of religious importance(Dash and Chauhan 2002, Dash 2005).Sacred groves vary in size from less than 1ha (1ha=10^4 m^2) (Ormsby 2013, Gupta and Sharma 2014) to several square km (Dash 2005). A wide variety of worldviews adopt the concept of sacred groves, including pantheistic belief systems (Ormsby 2013); monotheistic religions (Deil et al. 2005, Cardelus et al. 2013), and indigenous belief systems like the Niam Khasi or NiamTynrai of the Khasi tribe of Meghalaya (Ormsby 2013).

Dudley et al. (2009) state that species found in sacred natural sites (such as sacred groves) are protected and form a "shadow" conservation network, that exists by virtue of the fact of the sacredness of these sites and peoples' belief in them. As long as the beliefs that give importance to sacred groves persist, their protection may be perpetuated. Conversely, the weakening of regimes protecting sacred groves often corresponds to a change in the perceptions and beliefs with which they are associated (Tiwari et al. 1998a, Ormsby and Bhagwat 2010, Ormsby 2013). Degradation of groves has also been linked to changes in the belief system from one that reveres them, to one that does not (Tiwari et al. 1998a). Sacred groves are also vulnerable to disturbance on account of human activities such as resource harvesting etc. (Mishra et al. 2004) and require active conservation to ensure their continued existence.

The state of Meghalaya in Northeast India is well known for the sacred groves found within its borders. Tiwari et al. (1998b) documented 79 sacred groves occupying a total of 26,326ha in the state. Malhotra et al. (2001) and Khan et al. (2008) record Meghalaya as having the largest area covered by them in the country. However, less than 40% of sacred groves evaluated in terms of canopy cover in the state have been classified as undisturbed or dense (Tiwari et al. 1998a). Several studies have elucidated evidence of linkage between decline in sacred groves in the state and resource pressure (Mishra et al. 2004) and cultural or religious issues (Tiwari et al. 1998a, Ormsby 2013).

In the past, studies in the state have focussed on assessing biodiversity within sacred groves (Tripathi 2002, Upadhaya 2002, Mishra et al. 2004). Some studies endeavoured to assess both biodiversity and socio-cultural dimensions (Tiwari et al. 1998a). However, comparatively few recent studies in the state have been focussed on local attitudes towards sacred groves and how such attitudes impact their conservation and management (Ormsby 2013). Attitudes and perceptions constitute a social dimension that has an important role to play in conservation (Anderson et al. 2005). Understanding how local communities perceive of sacred groves is important in lending insights into how they manage and coexist with them. In light of this, the present study was conducted in two communities, each of which is situated adjacent and manages a sacred grove in their immediate vicinity.

The objective of this study is to analyse the local perceptions and attitudes towards sacred groves in two areas. The first site is Mawphlang, a location well known for its sacred grove known locally as 'law Lyngdoh or 'lawkyntang. The second site is Swer, the location of 'law Ryngkew Lum Swer, a sacred grove occupying a hill called Lum Swer, in the immediate vicinity of the settlement. Past studies at the sites have been primarily floristic (Rao et al. 1990, Barik et al. 1996, Tripathi, 2002, Mishra et al. 2004). Studies exploring local attitudes and perceptions have involved communities at Mawphlang (Ormsby 2013). However, Swer was not included in the study of Ormsby (2013) and it is not specified by Tiwari et al. (1998a) if it was selected as a sample site for exploring socio-cultural dimensions of their study. It is thus the aim of this study to expand the body of knowledge regarding socio-cultural dimensions of sacred groves by exploring the attitudes and perceptions of communities towards sacred groves in general and of the most adjacent to their settlement, with a view of achieving a clear understanding of the role that the respective communities play in the management and conservation of the sacred groves in their immediate vicinity.

STUDY AREA

Meghalaya is a state in northeast India. It is situated between 25°02' and 26°07' N Latitude and 89°49' and 92°50' E Longitude and has a total area of 22,429 km^2 at elevations ranging from approximately 50 m

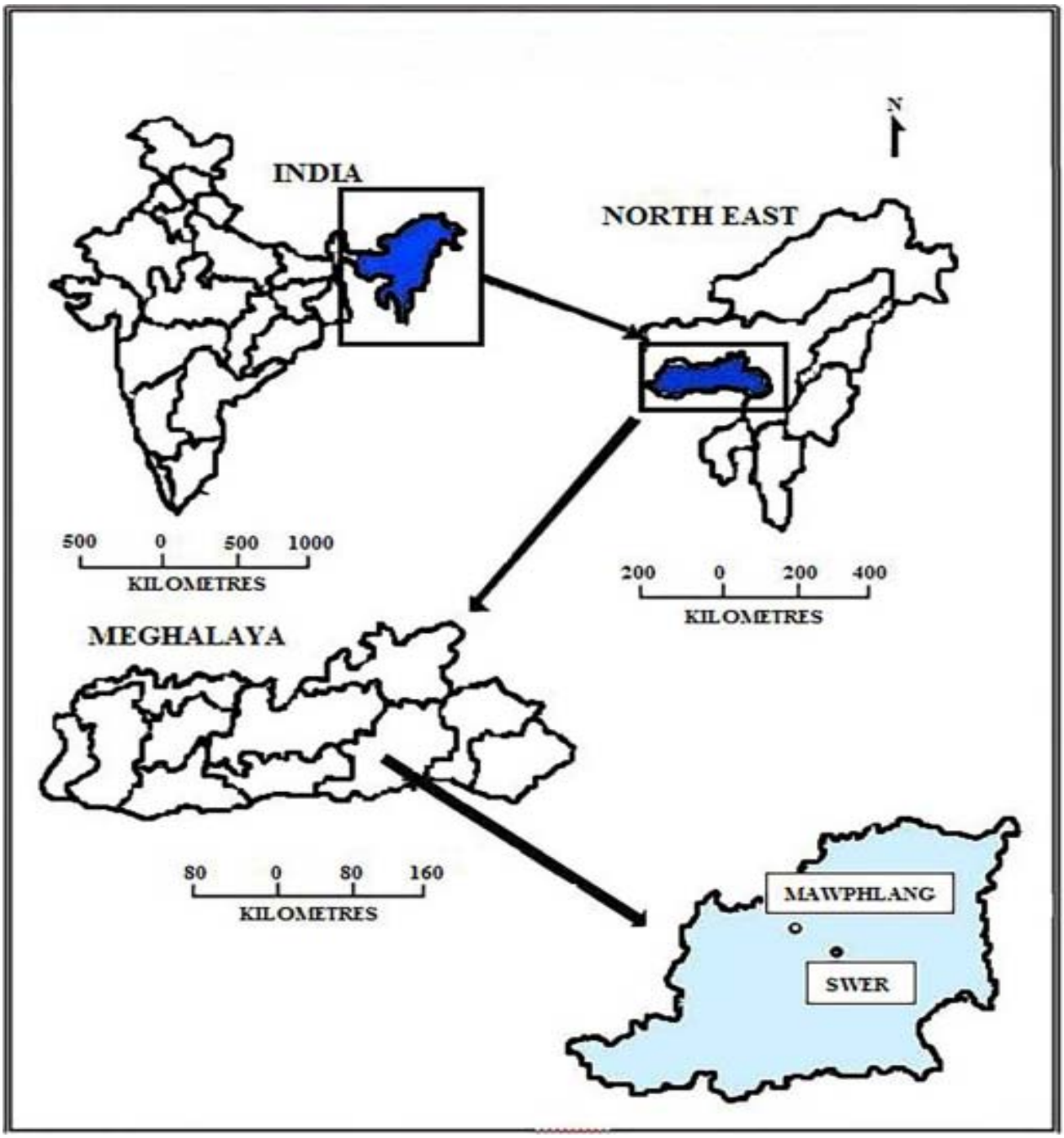

Figure 1. Location map of the study area

to 1961m above sea level. The population of the state is 2,966,889 (Census 2011). A total of 17,118.79 km^2 (76.32%) of the State is under forest cover (FSI 2019). The average rainfall is about 2500 mm (Khan et al. 1987, Barik, et al. 1996, Mishra et al. 2004), of which about 85% falls during the monsoon season (Khan et al. 1987, Barik et al. 1996, Mishra et al. 2004).

Village communities at Mawphlang and Swer were selected for their proximity to sacred groves that occur within the authority and jurisdiction of the respective village authorities. Mawphlang sacred grove is situated within the jurisdiction of Mawphlang block, and is a grove of approximately 77ha size. It is a popular tourist attraction, well-known throughout India and internationally (Ormsby 2013). Swer sacred grove is located within the jurisdiction of Swer village, with an approximate size of 50-60ha. It has not, as of the completion of this study, been marketed as a tourist attraction. Access

is limited by the absence of a metalled road.

Sacred groves in Meghalaya are usually administered and protected by local communities (Tiwari et al. 1998a). Regulations are not uniform and may vary from community to community. Visitors can only enter Mawphlang sacred grove while accompanied by a local guide, on the payment of an entry fee. Entry into Swer sacred grove however, does not require fee payment, and may be accessed without supervision. Certain actions such as relieving oneself, using the sites for romantic rendezvous, harvesting of wood, and hunting are generally viewed as impermissible or inappropriate within sacred groves (Ormsby 2013) but the enforcement of such regulations was observed only at Mawphlang. Personal interaction with village authorities at Swer revealed that they permit the collection of non-timber forest products such as fruits, berries, etc. Cutting down of trees however is not allowed, and hunting, though permitted in the past, is now discouraged.

Two villages situated in close proximity to 'law Lyngdoh/Mawphlang sacred grove in Mawphlang block were selected for this study. These are Dongiewrim and Nongrum village. Dongiewrim has a total population of 676 individuals from 146 households, of which 332 were male and 344 were female (Census 2011). Nongrum village has a total population of 632 individuals from 120 households, of which 309 were male and 323 were female (Census 2011).

Swer village, within the jurisdiction of which 'law Ryngkew Lum Swer sacred grove is found, was selected for this study. Swer village has a total population of 1365 individuals from 275 families, of which 684 were male and 681 were female (Census 2011).

MATERIAL AND METHODS

A structured questionnaire was used to assess the (i) socio-economic status of the village residents and (ii) their knowledge and perceptions as well as their attitude towards sacred groves. The questionnaire was translated into the native Khasi vernacular. A 5 point Likert scale (Likert 1932) was also employed to evaluate attitudes towards sacred groves through pre-generated statements with which respondents were required to express degrees of agreement or disagreement. Developed by Likert (1932) and widely used in similar types of research, the Likert scale is an attitude scale, designed to ascertain individuals' perceptions, emotional responses and their beliefs about a particular object, entity or concept (Balasubramanian 2012). Respondents' attitudes are determined via the indication of their personal feelings towards individual statements measured on an ordinal scale (Balasubramanian 2012, Willits et al. 2016). Qualitative questions were open-ended and respondents were required to give reasons for their responses. The sampling method employed was simple random sampling. The study was conducted from August-October 2020. Community authorities were approached for initial interaction and permission to conduct the study. Authorities were asked regarding rules and regulations governing activity in the grove. Once permission was granted, questionnaires were distributed to adult respondents at each village. 150 questionnaires each were distributed at Swer and Mawphlang. They were retrieved once completed. The results of the Likert scale responses were evaluated for reliability using Cronbach's Alpha reliability test (Cronbach 1951).

RESULTS

At Mawphlang block, a total of 133 respondents returned the questionnaire of which 69 were from Dongiewrim village and the remaining 64 were from Nongrum village. This comprised over 10% of the total population of each village. At Mawphlang, 52.6% of the respondents were female and 47.4% were male. In terms of the distribution of religion, 86.5% of respondents were Christian and 13.5% belonged to the Niam Khasi.

At Swer, 139 questionnaires were returned, constituting over 10% of the population of the village. Of the total number of respondents, 56.1% were male and 43.9% female. In terms of the distribution of religion, 80.6% of respondents belonged to the Niam Khasi and 19.4% were Christian. Responses to the questionnaire are summarized in Table 1.

At Mawphlang, 98.5% of all respondents stated that they often visit the grove in their vicinity, while

Table 1. Responses (% of respondents) to questions about sacred groves

No.	Question	Mawphlang			Swer		
		Yes	No	No response/ knowledge	Yes	No	No Response/ knowledge
1	Do you have knowledge about the sacred grove near you?	100	0	0	95	5	0
2	Do you think sacred groves are important?	88.7	1.5	9.8	93.5	0.7	5.8
3	Are rituals still being conducted in the sacred grove?	6.8	32.3	60.9	35.9	5.8	58.3
4	Do you know the last time rituals were conducted in the grove?	15.8	84.2	0	17.3	82.7	0
5	Do you or have you taken part in religious rituals associated with the sacred grove?	0	100	0	0.7	99.3	0
6	Are the sacred groves in decline in your area?	20.3	62.4	17.3	1.4	85.6	12.9

at Swer this figure was slightly lesser (83.5%). At Mawphlang, 98.6% of female respondents and 98.4% of male respondents stated that they do visit the grove. At Swer, 94.9% of male respondents, and 68.9% of female respondents stated that they visit the grove from time to time. Entry at either site is not restricted based on gender considerations.

Respondent participation in rituals was recorded as negligible and the majority at both sites did not know if rituals are still being carried out (Table 1). At Mawphlang, 9.8% of the respondents stated that rituals were last conducted in 1959, while 6% stated the last ritual was held in 1950. Only 5.3% stated they are conducted once a year while 0.8% stated they are conducted once a month and 0.8% said they are conducted once in 6 months. However, none of them could recall when exactly a ceremony was conducted.

At Swer, 13.7% stated that rituals were last conducted in March 2020. One respondent was the President of the Executive Committee of the 3 clans who are in charge of the grove. He stated that he participated in the rituals that were held most recently, i.e. in March 2020. Furthermore, 0.7% (i.e. one respondent each) gave the years 1980, 1990, 2010, 2014 and 2019, respectively, as the last time that they recalled the rituals were conducted.

At Swer, while 15.1% of all respondents stated that rituals take place annually, about 5% of the total respondents stated that rituals take place both annually and also as and when needed. On the other hand, while some respondents (2.2% of total respondents) stated that rituals are carried out once in 5 years, some other respondents (0.7% of total respondents) informed that rituals take place typically once in every 5 years with intermittent conduct of rituals depending on the communities' discretion. Another 0.7% of total respondents stated that the rituals are conducted once in 10 years, about 2.2% of the total respondents reported that more than 10 years have passed since the last time rituals were conducted. About 5.8% of the total respondents stated that in this sacred grove, rituals are no longer performed.

The respondents who stated that rituals have stopped were asked to give reasons for the stoppage. At Mawphlang, 25.6% stated that change in religion from Niam Khasi to Christianity by many community members was the reason rituals are no longer performed. These constitute 79.1% of respondents who stated that rituals have ceased, and the remainder gave no reason. At Swer, those who stated rituals have ceased did not give any reasons.

Non-participants in religious rituals were asked to give reasons for their non-participation. At Mawphlang, 34.6% gave no reason for their non-participation. It was also stated by 4.5% that only local traditional authorities and office bearers can take part while 3% stated that only elders of the Niam Khasi participate. Furthermore, 1.5% stated that no ceremony has been conducted since their birth till date, while 1.5% stated that they are too young to take part and 1.5% stated that they have chosen not to participate.

At Mawphlang, 44.3% of female respondents stated that women are not allowed to participate in such rituals. Furthermore, 38.6% of female respondents gave no reason for their response, 8.6% stated that they are not members of the indigenous religion, 4.3% stated that only members of the

eligible clans may participate, 1.4% cited that only office bearers, priests and chieftainship authorities can take part, 1.4% cited that only elders are allowed to participate and 1.4% cited that they were too young to participate. At Swer, none cited gender as a reason. 63.9% of the female respondents stated that only members of the eligible clans may participate, 21.3% of women cite that they are not members of the indigenous religion, 13.1% gave no reasons and 1.6% cited that they were too young to participate.

At Swer, 70.5% of all respondents stated that only selected members of the selected clans that oversee the sacred grove can participate in the rituals. Additionally, 17.3% of respondents stated that due to their belief in Christianity they are not participating in the rituals. No specific reason for non-participation in the rituals was given by 12.2% of the respondents. At Mawphlang, 39.1% of Christians cited non-religious reasons (i.e. gender, age, personal choice not to participate, and ineligibility) and 31.3% of Christians gave no reason for their non-participation. Only 29.6% of Christians cited religious difference stating that, as Christians, they no longer believe in the rituals.

Respondents who stated that they think sacred groves are important (Table 1) were asked in an open ended question to give reasons for their answer. Respondents gave several replies that can be seen in Table 2. At Swer, respondents who gave religious and socio-cultural reasons for the importance of sacred groves also included the belief that the forest deity would protect villagers from calamities, diseases and harm. At Mawphlang, respondents did not mention the role of the forest deity in protecting them from harm, but emphasized the role of sacred groves such as theirs as a part of their cultural heritage. Due to the close proximity and direct interaction that the respondents have with the sacred grove in their immediate vicinity, it is inferred that the respondents' primary experience is of the sacred grove closest to them. As a result, answers regarding why they think sacred groves are important is primarily in reference to the grove in their immediate vicinity, but is inclusive of sacred groves in general.

The responses given by the subjects indicate a perceptible relationship with the sacred grove in their vicinity. Aesthetic and recreational benefits listed by respondents from both sites are limited to their claim that each respective sacred grove ('law lyngdoh and 'law Ryngkew lum Swer) helps to beautify the area and provides a place where they can go for walks, or picnics. Respondents at Mawphlang also described that they would go for morning walks and for exercise to Mawphlang sacred grove.

Most respondents at both sites do not believe their sacred groves to be declining. Those that do believe them to be declining gave several reasons for their answer. The reasons are listed in Figure 2.

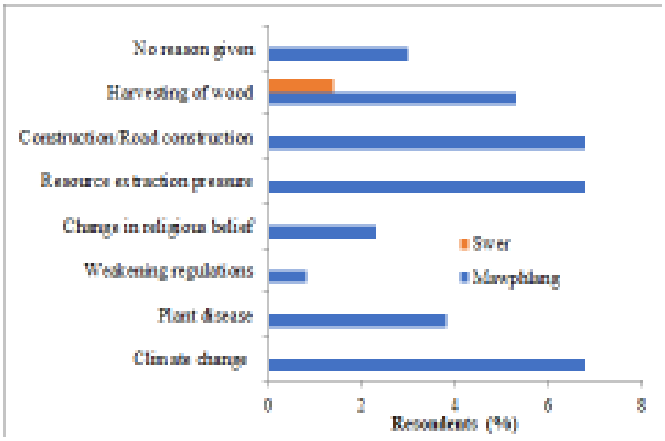

Figure 2. Reasons given by respondents for the decline in sacred groves

Cronbach's Alpha Reliability Test for ordinal data obtained via response to pre-generated Likert scale statements for Mawphlang sacred grove and Swer sacred grove recorded the value 0.824 and 0.748

Table 2. Reasons given by respondents (%) for the importance of sacred groves

No.	Reasons given by Respondents for the importance of sacred groves	Mawphlang	Swer
1	Sacred groves are of religious and socio-cultural importance	33.9	40
2	Sacred groves perform ecosystem services (fresh air, prevent soil erosion etc.) and provide non-timber forest products for consumption	37.3	21.5
3	Sacred groves help conserve biodiversity and are a habitat for wildlife	22	43.1
4	Sacred groves provide aesthetic and recreational benefits	13.6	26.9
5	Sacred groves are tourist attractions.	7.6	1.5

Table 3. Respondent attitudes towards significance of sacred groves

No.	Statements	Community	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	Sacred Groves are of social and community importance	Mawphlang	57.14	36.84	6.02	0.00	0.00
		Swer	69.06	26.62	3.60	0.00	0.72
2	Sacred groves are of religious importance	Mawphlang	31.58	42.86	23.31	1.50	0.75
		Swer	60.43	20.86	13.67	2.88	2.16
3	Sacred Groves provide employment and a source of income to local unemployed	Mawphlang	24.06	59.40	12.03	4.51	0.00
		Swer	0.72	9.35	35.25	27.34	27.34
4	Sacred Groves important for the environment, biodiversity and as habitats for wildlife	Mawp-hlang	85.71	13.53	0.75	0.00	0.00
		Swer	89.21	9.35	0.00	0.00	1.44
5	Sacred groves are important tourist attractions.	Mawphlang	42.11	49.62	8.27	0.00	0.00
		Swer	28.06	38.85	23.74	5.04	4.32
6	There is a need to conserve sacred groves for present and future benefit	Mawphlang	70.68	24.81	4.51	0.00	0.00
		Swer	86.33	10.79	1.44	0.72	0.72
7	Sacred groves are the abode of spirits and forest dwelling deities	Mawphlang	40.60	33.08	24.81	1.50	0.00
		Swer	50.36	24.46	20.14	1.44	3.60
8	Forest deities punish anyone who violates or desecrates sacred groves	Mawphlang	40.60	20.30	35.34	3.76	0.00
		Swer	32.37	28.06	28.06	5.04	6.47

respectively, indicating a high degree of reliability. Respondents at both sites gave varied responses to pre-generated statements regarding the significance of sacred groves (Table3). They differed significantly in opinion regarding the role of sacred groves as sources of employment and income. They however generally agreed that sacred groves are of social, religious and environmental importance, and are significant as habitats for wildlife, thus enforcing the view that they must be conserved.

At Mawphlang, 100% of respondents belonging to the Niam Khasi indicated agreement (agree or strongly agree) while 94.7% of Christians indicated agreement (agree or strongly agree) with the statement that sacred groves should be conserved for present and future benefit. 5.2% of Christians were neutral. At Swer, 100% of Christians agreed with this statement agree or strongly agree), and it is significant that 85.2% of them indicated their strong agreement with it.

With regard to gender, at both sites, the majority of males (98.7% of men at Swer and 95.3% of men at Mawphlang) indicated agreement (agree or strongly agree) that sacred groves are of social and community importance. Similarly, majority of females at both sites (92.8% of women at Mawphlang and 91.8% at Swer) also indicated their agreement with this statement (agree or strongly agree). Notably, 70.5% of males at Swer and 52.4% at Mawphlang indicated strong agreement, while among females, 67.2% at Swer and 61.4% at Mawphlang and indicated strong agreement.

At both sites, a majority of respondents across both genders agreed that sacred groves should be conserved for present and future benefit. Notably, at both sites the majority of males (93.7% at Mawphlang, and 98.7% at Swer) indicated their agreement (either strongly agree or agree) with this statement. Similarly, among women, 97.1% at Mawphlang, and 95.1% at Swer also indicated either agreement or strong agreement with this statement. In both cases, the majority indicated a strong agreement. Notably, among males, 65.1% at Mawphlang and 89.7% at Swer indicated strong agreement. Among females, 75.7% at Mawphlang, and 82% at Swer indicated strong agreement with this statement.

DISCUSSION

Local attitudes towards sacred groves at both sites showed notable differences and similarities. Religion and gender inter alia play important roles in influencing both, particularly in terms of beliefs concerning the sacred grove and participation in rituals. Views on sacred grove as tourist attractions, their importance and attitudes towards conservation are discussed below.

Sacred groves and religion

Despite their relative proximity to one another, it

must be noted that the populations of the two selected sites demonstrate notable differences in religious beliefs. Swer has a predominantly non-Christian respondent population while Mawphlang's respondents are predominantly Christians. However, similar majorities of respondents at each site believe that their sacred groves are the abodes of forest deities/spirits. Similar majorities at both sites also believe that anyone who commits an act that is considered taboo in the grove will be punished by the forest deity. At Mawphlang, non-Christian and a notable percentage (72.2%) of Christian respondents share the belief in the existence of forest deities. Remarkably, 61.7% of Christians also believe violators will be punished by the deity. Their subscription to Christianity does not seem to preclude their belief in the existence of forest deities and their activities. At Swer, Christians are mostly neutral or do not believe in the above.

A notable percentage (25.9%) at Swer who belong to the Niam Khasi revealed their belief in the power of the resident deity/spirit of the grove to protect them from calamities and diseases. A few mentioned the 2020 Covid-19 pandemic, stating that protection against the pandemic was sought from the forest deity of the grove and rituals were conducted accordingly. Findings from Mawphlang did not yield the same results, i.e. no respondents described the role of the local forest deity/spirit in protecting them from any form of harm. This finding contradicts that of Ormsby (2013) who reported that some Mawphlang residents stated aid would be sought from the forest deity in case of the spread of disease. Respondents at Mawphlang cited the importance of sacred groves such 'law Lyngdoh, as artefacts of cultural heritage. However, the majority of respondents from Mawphlang agreed that sacred groves have religious importance.

If the belief in the existence and power of forest deities inhabiting sacred groves persists, it may motivate local communities to preserve them and deter any activities that may cause damage to them. All respondents at Mawphlang and the majority (99.3%) at Swer do not participate in religious ceremonies related to the grove. The majority cannot recall accurately when the last time that ceremonies were held. More respondents at Mawphlang than at Swer stated that the rituals have since cease to be performed. Respondents at Mawphlang who could recall the last time rituals were performed claimed that the last time they were conducted was in the 1950s. This may reflect the statement of Khiewtam and Ramakrishnan (1989) that the practice of religious rituals in sacred groves has stopped at many sites throughout the Khasi hills. Performance of rituals seems limited to selected individuals such as religious leaders and/or clan elders and chieftains. At Swer, rituals have been reported as recently as 2020. At Mawphlang, some stated that a change in religion from Niam Khasi to Christianity by many members of the community is the reason that they believe that the rituals have been stopped. This supports the finding of Tiwari et al. (1998a) that conversion to Christianity brings about a decline in communities' interest in and performance of rituals associated with sacred groves.

The role of gender

Gender plays an important role in determining participation in religious rites and ceremonies. A notable percentage of women at Mawphlang stated that only men are allowed to participate in religious ceremonies related to the grove. At Swer, while this reason is not stated, respondents used the native term "u rangbah" to describe those selected to participate. Used in this context, this term denotes a male elder of mature or advanced age and is not used to describe any member of the female gender. This finding supports that of Ormsby (2013) that knowledge of religious ceremonies is greater among males. The results indicate that there is little significant difference in gender roles between sites with regards to the conducting of rituals in the sacred groves.

The results also indicate that participation in religious rituals with regard to sacred groves rests solely with males with women being barred from taking part. This is similar to the findings of Sinha, (1989), Roy Burman (1996) and Godbole et al. (1998) that priests were all male. The results also give clarity to the question raised by Malhotra et al. (2001) regarding the role of gender with regards to sacred groves in Khasi matrilineal society. The results show that while women cannot take part in rituals, they are not barred from entering the sacred groves at the study sites. Most female respondents at both sites stated that they have visited the grove in their vicinity. This differs from the findings of Malhotra

et al. (1997) among the tribes of south-west Bengal and Koratpur district, Odisha that considered it taboo for women to enter sacred groves. Given that the respondents were all adults and that majority of female respondents visit the grove, the results also disagree with the general statement given by Malhotra et al. (2001) that women cannot enter sacred groves once they have reached adolescence. Unlike in the case of the sacred groves of Kerala (Chandrashekara 2011) the selected study sites do not have any temples situated inside them or in their immediate vicinity. The findings thus clearly indicate that the entry of women into the groves is not related to the presence or absence of temples within or in the immediate surroundings. Thus the norms regarding the entry of women into sacred groves in the study area are different from those in Kerala as reported by Chandrashekara (2011). For example, entry of women into sacred groves in Kerala depends on the days of the week, and whether temples are situated outside or within the grove (Chandrashekara 2011). The majority of female respondents at both sites i.e. Mawphlang and Swer agree that sacred groves are important for their society and community, and must be conserved for present and future benefit.

Sacred groves and tourism

'law Ryngkew Lum Swer sacred grove has not been marketed as a tourist attraction as of the writing of this article and access to it remains hindered by the lack of a metalled road and transport. Access to the grove is also unrestricted and not monetised. It may be argued that the majority of respondents from Swer village do not view their sacred grove as a source of employment because it does not serve as a source of employment through tourism. However, a majority (66.9%) agree that sacred groves do attract tourists, which seems to indicate that though visitors do come, their visits are not a source of income or employment for locals. On the other hand, 'law Lyngdoh sacred grove at Mawphlang serves as a popular tourist attraction, and entry into the forest has been monetised. Local individuals serve as guides who take tourists on paid explorations of the grove. Therefore, the grove provides employment to local communities. The majority of respondents at Mawphlang agree that sacred groves are tourist attractions and can also provide employment and a source of income. However, very few at both sites cited this as a reason for the importance of sacred groves.

Views on decline of sacred groves

The majority of respondents at Swer and Mawphlang do not believe the sacred groves in their area, inclusive of 'law Lyngdoh and 'law Ryngkew Lum Swer, are in decline. Those that do believe in its decline gave several reasons for their answer that are given in Figure 2. At Swer, only deforestation due to the unauthorized harvesting of wood was given as a reason for decline. At Mawphlang several causes such as road construction, deforestation and plant diseases (see Fig. 2) were cited. However, the majority of respondents at both sites do not believe that the sacred groves in their vicinity are in decline (see Table 1). It may also be noted that 'law Lyngdoh in Mawphlang is marketed to tourists as an undisturbed forest.

Views on importance and conservation of sacred groves

A comparison of Table 2 and Table 3 indicates that, when asked an open ended question to give reasons why they think sacred groves are important, the respondents gave the reasons that they considered most important to them, but these are not necessarily their only reasons for considering sacred groves as important. For example, over 80% of respondents at Mawphlang agree that sacred groves are a source of income and employment and over 90% agreed that they are important tourist attractions. However, when asked to give reasons why they think sacred groves are important, very few cited this as a reason (7.6%, Table 2). This indicates that while the local populace does view the sacred groves as an important source of income that attracts tourists, their value as tourist attractions is preceded by other benefits. Similarly, a majority, (over 90%) at both sites agree that sacred groves are important from a social and community perspective (Table 3), but few (33.9-40%, Table 2) gave this as a reason for why they think sacred groves are important. Furthermore, a majority (over 90%) at both sites agree that sacred groves are important for the environment, biodiversity and as habitats for wildlife. However, comparatively fewer again (22-43.1% from Table 2) listed the role of sacred groves in conservation of biodiversity and as habitats for wildlife as a reason for the importance of sacred groves. Comparatively few also listed the role of

sacred groves in performing various ecosystem services (21.5-37.3%, see Table 2) as reasons for their importance. This indicates that while respondents may generally agree that sacred groves have social, community or environmental significance, or that they are important as habitats for wildlife and biodiversity conservation, any one of these reasons may not be foremost in their perceptions and may be preceded by any of the others recorded above.

The Likert scale data from Table 3 also reveals that at Swer, just over 10% agreed that sacred groves are important sources of income and employment. Some at Swer described the harvesting of certain non-timber forest products from the vicinity of the grove, such as grass, fruits, flowers etc. as a possible source of income. However, in our visits, we found no instances of the harvesting or trade of such products. At Mawphlang, consumption of such products is permitted within the grove but they cannot be taken away. It is also significant that a majority of respondents (over 90%) at both sites, from both genders and belief systems, agreed that sacred groves should be conserved for present and future benefits (Table 3). If this view can be expressed as community action, vis-à-vis conservation of sacred groves, then these sites may be preserved for present and future generations.

CONCLUSIONS

The above study highlights similarities and differences in the attitudes and perceptions of the two communities with regards to sacred groves. In spite of the differences in religious beliefs between the two communities, the sacred groves still remain, and the majority of both communities do not believe them to be declining. Most respondents at both communities share a belief in the existence of a forest deity who dwells in their sacred grove (Table 3), with a similar percentage at both sites voicing their belief in the power of the deity to punish those who commit acts considered taboo. However, while the predominantly Christian respondents at Mawphlang consider the socio-cultural value of sacred groves to consist mainly in their role as artefacts of cultural heritage, respondents at Swer, still believe in the power of the grove to protect them from harm.

Despite their various beliefs with regards to the spirituality of the sacred groves and its effect on them, the respondents' participation in the corresponding rituals held at the groves is seen to be variable. For instance, no respondents at Mawphlang affirmed that they take part in the rituals and the majority at Swer do not participate in them. The respondents at Mawphlang reported that the rituals were last conducted in the 1950s, while at Swer, rituals have been reported as recently as 2020.

The two communities do not differ in their view of the role of women with regards to the rituals performed at sacred groves. But the norms regarding women and sacred groves among the communities of Swer and Mawphlang do show differences when compared to the norms and regulations of other communities that manage sacred groves (Malhotra et al. 1997, Chandrashekara 2011).

The study also finds that while respondents may have differing views on the role of sacred groves and the primary reasons why they think groves are important, they nevertheless agree on the principle that sacred groves are of importance and must be conserved. The study also shows that a majority of respondents (Table 3) at both sites, regardless of religion or gender, hold that sacred groves must be conserved for present and future benefit. Further qualitative study may be conducted in the future in order to explore the implications of the results that have been uncovered in this study.

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REFERENCES

Anderson, D. M., Salick, J., Moseley, R.K. and Xaiokun, O. 2005. Conserving the sacred medicine mountains: a vegetation analysis of Tibetan sacred sites in Northwest Yunnan. Biodiversity and Conservation, 14, 3065-3091. https://case.edu/affil/tibet/documents/anderson.pdf.

Balasubramanian, N. 2012. Likert technique of attitude scale construction in nursing research. Asian Journal of Nursing Education and Research, 2(2), 65-69.

Barik, S.K., Tripathi, R.S., Pandey, H.N. and Rao, P. 1996. Tree regeneration in a subtropical humid forest: Effect of cultural disturbance on seed production, dispersal and germination. Journal of Applied Ecology, 33, 1551-1560.

Bhagwat, S.A. and Rutte, C. 2006. Sacred groves: Potential for biodiversity management. Frontiers in Ecology and the Environment, 4(10), 519-524.

Cardelus, C.L., Scull, P., Hair, J., Baimas-George, M. and Lowman, M.D. 2013. A preliminary assessment of Ethiopian sacred grove status at the landscape and ecosystem scales. Diversity, 5 (2), 320-334.

Census of India, 2011. Office of the Registrar General &Census Commissioner, India .India.

Census of India, 2011.Meghalaya District Census Handbook: East Khasi Hills. Primary Census Abstract. Directorate of Census Operations, Meghalaya.

Chandrakanth, M.G. and Romm, J. 1991. Sacred forests, secular forests, policies and people's actions. Natural Resources Journal, 31, 741-756.

Chandrashekara, U.M. 2011. Conservation and Management of Sacred groves in Kerala. (KFRI Research Report No: 412), 74pp.

Cronbach, L.J. 1951. Coefficient alpha and the internal structure of tests. Psychometrika, 16(3), 297-334.

Dash, S.S. 2005. Kabi sacred grove of North Sikkim. Current Science, 89(3), 427-428.

Dash, S.S. and Chauhan, A.S. 2002. Kabi sacred grove in Sikkim. relevance to conservation. pp 713-731. In Dash, A.P. (Ed.) Prospectives of Biodiversity. Bishen Singh, Mahendra Pal Sing, Dehra Dun.

Deil, U., Culmsee, H. and Berriane, M. 2005. Sacred groves in Morocco: A society's conservation of nature for spiritual reasons. Silva Carelica, 49, 185-201.

Dorm-Adzobu, C., Ampadu-Agyei, O. and Veit, P.G. 1991. Religious beliefs and environmental protection: The Malshegu sacred grove in northern Ghana. Acts Press, 1991.

Dudley, N., Higgins-Zogib, L. and Mansourian, S. 2009. The links between protected areas, faiths and sacred natural sites. Conservation Biology, 23(3), 568-577.

Forest Survey of India, 2019. State of Forest Report. Forest Survey of India. Ministry of Environment and Forests. Dehradun, India.

Gadgil, M. and Vartak, V.D. 1976. The Sacred Groves of Western Ghats in India. Economic Botany, 30(2), 152-160.

Godbole, A., Watve, A., Prabhu, S. and Sarnaik, J. 1998. Role of sacred groves in biodiversity conservation with1ocal people's participation: A case .study from Ratnagiri district, Maharashtra, pp. 233-46. In: Ramakrishnan, P.S., Saxena, K.G. and Chandrashekara, U.M. (Eds.) Conserving the Sacred for Biodiversity Management, Oxford and IBH Publishing Co., New Delhi.

Gupta, B. and Sharma. S. 2014. Estimation of biomass and carbon sequestration of trees in informally protected areas of Rajouri, J&K, India. International Research Journal of Environmental Sciences, 3(6), 56-61.

Khan, M.L., Rai, J.P.N. and Tripathi, R.S. 1987. Population structure of some species in disturbed and protected subtropical forests of northeast India. ActaÔcologia/ ÔcologiaApplicata, 8(3), 247-255.

Khan, M. L., Khumbongmayum, A. D. and Tripathi, R. S. 2008. The sacred groves and their significance in conserving biodiversity: an overview. International Journal of Ecology and Environmental Sciences, 34(3), 277-291.

Khiewtam, R.S. and Ramakrishnan, P.S. 1989. Socio-cultural studies of the sacred groves of Cherrapunji and adjoining areas in North-Eastern India. Man in India, 69, 64-71.

Likert, R. 1932. A Technique for the Measurement of Attitudes. Archives of Psychology, 22, 5-55.

Malhotra, K.C., Stanley, S., Hemam, N.S. and Das, K. 1997. Biodiversity conservation and ethics: Sacred groves and pools, pp. 338-345. In: Fujiki, N. and Macer, R.J. (Eds.) Bioethics in Asia, Eubois Ethics Institute, Japan.

Malhotra, K. C., Gokhale, Y., Chatterjee, S. and Srivastava, S. 2001. Cultural and Ecological Eimensions of Sacred Groves in India. Indian National Science Academy, New Delhi and Indira Gandhi Rashtriya Manav Sangrahalaya, Bhopal. 30pp.

Mishra, B.P., Tripathi, O.P., Tripathi, R.S. and Pandey, H.N. 2004. Effects of anthropogenic disturbance on plant diversity and community structure of a sacred grove in Meghalaya, northeast India. Biodiversity and Conservation, 12, 421-536.

Ormsby, A. 2013. Analysis of local attitudes toward the sacred groves of Meghalaya and Karnataka, India. Conservation and Society, 11(2), 187-197.

Ormsby A. and Bhagwat, S.A. 2010. Sacred Forests of India: a strong tradition of community based natural resource management. Environmental Conservation, 37 (3), 320-326.

Pala. N.A., Lama, D.D., Gusain, G. and Mahato, S. 2014. Management regime and floristic composition in miniature sacred groves of district Dehradun, Uttarakhand. International Journal of Research in Biological Sciences, 4(1), 10-15.

Rao, P., Barik, S.K., Pandey, H.N. and Tripathi, R.S. 1990. Community composition and tree population in a sub-tropical broad leaved forest along a disturbed gradient. Vegetatio, 88, 151-162.

Rawat, L. 2014. Role of sacred groves in ameliorating microclimate: A case study of Nagdev temple forest of Pauri Garhwal, Uttarakhand Himalaya, India. International Journal of Biodiversity and Conservation, 6(1), 50-58.

Roy Burman, J.J. 1996. A comparison of sacred groves among the Mahadeo Kolis and Kunbis of Maharashtra. Indian Anthropologist, 26, 3746.

Sarfo-Mensah, P., Oduro, W., Anto-Fredua, E. and Amisah, S. 2010. Traditional representations of the natural environment and biodiversity conservation: Sacred Groves in Ghana. https://www.econstor.eu/bitstream/10419/43489/1/ 640602614.pdf.

Sinha, A.P. 1989. Religious Life of Tribal India: A Case Study of DudhKharia, Classical Publishers, New Delhi. 310pp.

Tiwari, B.K., Barik, S.K. and Tripathi, R.S. 1998a. Biodiversity value, status and strategies for conservation of sacred groves in Meghalaya, India. Ecosystem Health, 4(1), 20-32.

Tiwari, B.K., Barik, S.K. and Tripathi, R.S. 1998b. Sacred groves of Meghalaya. Pp. 253-262. In: Ramakrishnan, P.S., Saxena, K.G. and Chandrashekara, U.M. (Eds.) Conserving the Sacred, for Biodiversity Management. UNESCO and Oxford-IBH Publishing, New Delhi.

Tripathi, O.P. 2002. Study of Distribution Pattern and Ecological Analysis of Major Forest Types of Meghalaya. Ph.D. Thesis. Department of Botany, North Eastern Hill University, Shillong, India. 131 pp.

Upadhaya, K. 2002. Studies on Plant Diversity and Ecosystem Function in Sacred Groves of Meghalaya. Ph.D. Thesis. Department of Botany. North Eastern Hill University, Shillong, India. 107 pp.

Willits, F.K., Theodori, G.L. and Luloff, A.E.2016. Another look at Likert scales. Journal of Rural Social Sciences, 31(3), 126-139.

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