

THE VALUES OF SACRED SWAMPS: BELIEF-BASED NATURE CONSERVATION IN
A SECULAR WORLD

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ABSTRACT

Global forest loss is highest in the tropical region, an area with high biological biodiversity. As some of these forests are part of indigenous forest management, it is important to pay

attention to such management, its values and practices for better conservation. This paper focuses on sacred freshwater swamp forests of the Western Ghats, India, and with it a faith-based approach to nature conservation

Drawing on field work and focus groups, we present the rituals and rules that structure the governance of sacred swamps. We also discuss in depth the ecological, socio-cultural and economic valuation of these freshwater swamps by various local groups. In this way, we show overlaps and differences of valuation among different groups. In the context of a secular state with a diversity of faith groups and migration dynamics, we propose that faith-based governance of sacred swamps can benefit from the emphasis of faith-independent, “accessible” ecological, socio-cultural and economic values to foster a dialogue around sacred swamps and their place for livelihoods and nature conservation.

KEYWORDS

biodiversity, freshwater swamps, sacred swamp, values, Western Ghats

1. Introduction

Over the period 1990–2015, primary forest area has declined worldwide by 2.5% and in the tropics, the zone with the highest biological biodiversity, by 10% (FAO 2015, Hansen et al. 2013; Morales et al. 2015). The remaining primary forest will likely degrade further (Wright, 2005) with severe consequences for the many species depending on it (Gibson et al. 2011, 2012). Some of this remaining forest is still under the control of indigenous people. It is therefore important to understand the values and traditions governing indigenous management and its contribution to securing biodiversity and sustainable human conduct (Reynolds et al. 2017).

This paper focuses on the sacred swamps of the Western Ghats, India. Sacred swamps are freshwater swamps dedicated to worship one or several deities through long-term commitment and traditional laws and practices. Sacred swamps are a special type of sacred groves (or sacred woods). Such swamps and groves are of special religious importance for a culture, even though, as we will see, their importance is in no way limited to religious value only. They have existed in many parts of the world, but often have been degraded or have

disappeared completely, for example in many parts of the Mediterranean (Hughes and Chandran, 2000, for the history of such groves in the Western Ghats see Chandran et al. 1998).

There is much research on sacred groves (Bhagwat et al. 2012, 2014; Bhagwat and Rutte, 2006; Brown et al. 2006; Garg, 2013; Osuri et al. 2014), but almost no research has been done on sacred swamps. The first systematic attempt to study the distinct biophysical features of sacred swamps is our own prior research (Hegde et al. 2018). Sacred swamps appear to have features that distinguish them from other freshwater swamps. In the Western Ghats, they occur only in wet evergreen forests. They are located closer (average distance 100 m) to roads, human settlements and commercial orchards than non-sacred swamps (average distance 600 m, Hegde et al. 2018). The total number of plant species, genera and families, the number of critically endangered, endangered and vulnerable species, and the density of amphibians are higher, the basal area of trees and stem density larger, girth classes of trees more evenly distributed, and bird, butterfly and odonata species diversity and richness (slightly) higher in the sacred swamps compared to non-sacred swamps (Hegde et al. forthcoming). Sacred swamps thus appear to have a higher biodiversity, and by implication a higher nature conservation value.

Sacred swamps have a core zone - the depression part of the swamp - where strict rules apply, and a buffer zone with more relaxed restrictions. This differentiation is reminiscent of UNESCO biosphere reserves, which also have a no-go core zone and a development zone for sustainable agriculture and tourism (Stoll-Kleemann and Kettner, 2016). However, whereas biosphere reserves are a political construct, explicitly designed and regulated by the state for nature conservation, sacred swamps are places of worship. The sociology of religion suggests that rituals are central for the experience and keeping of sacred places and times (Durkheim 1915; Joas 2017).

The lack of scientific attention to sacred swamps also pertains to the features that define their sacredness. Even beyond a focus on the sacred swamps of the Western Ghats, only one major environmental philosopher appears to have written, in passing, about sacredness in relation to swamps:

When I would recreate myself, I seek the darkest wood, the thickest and most interminable and, to the citizen, most dismal, swamp. I enter a swamp as a sacred place, a sanctum sanctorum. There is the strength, the marrow, of Nature. (Thoreau, 1862)

Sacred in the sense of set apart and forbidden (Durkheim, 1915) implies a form of protection, as the core zone example above suggests. Yet, valuing a sacred place and respecting associate rules only makes direct sense and only has direct validity for the respective faith group. India has a huge religious diversity and substantial inland migration. Migrants will not necessarily respect or even know about local practices of religious respect, whereas youth may no longer want to reproduce the practices of their elders. Further, state agencies have their own missions, objectives and activities, which only rarely include the protection of sacred groves. Thus, local groups living around sacred swamps can be expected to adhere to, and to be exposed to, partly overlapping and partly conflicting values. We define “value” in this context as the way in which an environment, i.e. its individuals, processes and places, matters to those living from, in and with that environment (cf. O’Neill, Holland and Light, 2008). In this paper we explore the cultural practices and the heterogeneous or plural values adhered to sacred swamps, with special attention to values that are also open to those who do not belong to the faith group of the sacred swamp and that therefore might be especially important to ensure livelihood and nature conservation. In this context, we address the following questions:

1. What values are associated with sacred swamps?
2. Who holds these values?
3. What are the implications for nature conservation in a secular society?

2. Methods

To address the research questions, we organized in 2016-2017 ten focus group discussions (with in total 82 villagers) around ten sacred swamps in the districts of Uttara Kannada in the central Western Ghats, India. Meetings took place in premises belonging to community resource persons. Each group discussion took about 50 minutes. Where some stakeholders could not participate in the group discussions, additional meetings and interviews with individuals were organized.

As part of a participatory research, the focus group discussion and a scoring exercise were organized following Boef and Thijssen (2007) and Chevalier and Buckles (2008).

Discussions were conducted in the regional language Kannada and recorded in a notebook. All participants were familiar to the lead author, who has been involved in swamp restoration and preservation in the area for over ten years. Participants were recorded not by personal name but by age, gender and stakeholder category. They consented in the use of their quotes for this research project. The scoring method and results were explained to them, but they did not engage in writing or reviewing this paper.

The stakeholder categories were defined by the lead author based on his prior knowledge as a community organizer in the Western Ghats. Each participant assigned her/himself to one (and only one) category during the focus group meeting.

The following stakeholder categories were distinguished:

1. Believers: people living near the swamps who worship the swamp as sacred and preserve the tradition.
2. Temple committee members: people (only men) who are responsible for the management of local temples. The temple committee supports the sacred swamp tradition. Some temple committee members are also believers.
3. Non-timber forest products (NTFP) collectors: people, the majority of which being local residents with marginal land holding or landless, whose livelihood depends on NTFP gathering and agriculture labour for others. Some NTFP collectors are also believers.
4. Women: they produce agriculture and horticulture crops for livelihood cash income. Some women are also NTFP collectors, including from the buffer zone of sacred swamps. Many women are also believers. There are no women in the temple committee.
5. Village Forest Committee (VFC) leaders: elected by the village. All villagers, including women and migrants above the age of 18, are member of the VFC. The committee is formed under the national Ministry of Environment Forests and Climate Change to participate in the conservation and management of forests in the village in cooperation with the state forest department. It is the only group exclusively working on nature conservation with statutory recognition by the state. The committee meets once a year in a general meeting where major decisions/approvals are taken, which

are then implemented by the elected (11) VFC leaders. Since the committee has the mandate to co-manage the forests in association with the state forest department, leaders are legally empowered to protect and manage the sacred swamps. Some of VFC members are also believers.

6. Local administrators: members of the local governing institute called *grama panchayat*, which is an elected body to implement the rural development activities in the villages. The administration must spend at least 10 percent of its budget for local biodiversity conservation and establish biodiversity management committees to monitor the extraction and sale of natural resources and to collect revenue out of it. This group has no direct relation to the sacred swamp, but members of the administration are sometimes believers.
7. Migrants: people who have recently (not earlier than fifteen years ago) settled in the villages. Many of them have settled on forestland and converted it to agriculture, and some of them purchased land in the villages. Where they have a different tradition and faith, they also have a different, direct relation to sacred swamps. For example, in the village of *Nilkund* migrants do not follow the local faith and collect fuel wood, green leaves and leaf litter from the (core of the) sacred swamp. In *Bogrimakki* village, local believers and village forest committee members with help of the forest department fenced the sacred swamp to obstruct access of migrants to the sacred swamps.
8. Juveniles: members of youth clubs aged below 21, who participate in development activities in the village, work with various state departments and also participate in social activities. Some club members are also believers, NTFP collectors, women, and (if they are above the age of 18) village forest committee members.

Informed by de Groot et al (2002), Diaz et al. (2018) and prior conservation work of the lead author, we identified major value categories (hydrological, religious, biodiversity, recreational, utilitarian and social) and labelled them in such a way that participants could understand and rate them. At the end of the focus group discussions, participants were asked to rate the importance of each value category on a four-point scale, with four being the highest and one the lowest score. The differences in scores between stakeholder groups were analysed using the variance (ANOVA) statistical model in a completely randomized design (Zar, 1999).

3. Results

The central feature of a sacred swamp is the presiding deity, represented by a stone or sculpture. The most common deities are *Chowdi*, *Jatka*, *Beerlu*, *Huli Devaru*, *Naga*, *Devi* or *Vanadevate* and *Bhoota*. *Chowdi* is a goddess of water; a pond or small lake is always associated with *Chowdi*. *Jatka* and *Beerlu* are gods found where the sacred swamp borders the scattered houses of the village as they are assumed to protect the villagers. *Huli Devaru* is a tiger god, and *Naga* a serpentine god. According to local people living around the sacred swamps, in former times tigers were more abundant, causing problems for humans, especially by hunting cattle. *Devi* or *Vanadevate* is the mother goddess and, according to the locals, one of the oldest gods in the sacred swamps. Usually a heap of earthen pots (according to local people possibly the remnants of offerings to the deity in case of deadly diseases) is found in front of the stone/sculpture representing the goddess. *Bhoota* is an evil spirit, normally found at the border between the commercial orchard and the forest.

The worship of these deities includes a number of rules that must be respected. Entry to the core area is allowed only during annual worship/ritual and hence strict rules are followed here (Table 1). The priest and the people who clean the premise should have taken a bath and wear washed cloths when entering the sacred swamp and performing the *puja*, a ritual prayer, in all the rituals listed. Within the buffer zone, it is forbidden to cut trees, branches and twigs, pick flowers, collect NTFPs, poles, leaves and dead and fallen wood, hunt, gather and fish, erect any construction, spit, urinate and perform any activity that pollutes the water body. Collection of NTFPs is restricted to the belief group. Compliance with these rules is observed by the community and by the state forest department, who owns the land.

Table 1. *near here*

While rituals differ, we can see similarities in the worshipping and paying respect to a deity and its place. About three times a year, people gather to perform the rituals and thereby affirm the sacred status of the swamps.

The rituals extend to everyday life in the sense that the deity guards the worshippers and the people offer prayers regularly, not just during the above-mentioned special days. For instance, when friends or relatives visit the house of a believer pair and their baby starts crying, coconut and *puja* will be offered near the swamp, i.e. near or in the buffer zone, facing towards the deity. Similarly, if someone is ill, grazing cows do not come back to the cattle-shed or a cobra appears in the premises, people worship the deity. These everyday

rituals and prayers are performed near the entry of the sacred swamp but outside of the core area.

We now discuss each value category, whereas Table 2 shows the results of the scoring exercise.

Table 2. *near here*

Stakeholder group provided different scoring to the values and the ANOVA test shows that the scores differ significantly from the null hypothesis (no difference).

Hydrological values

Freshwater swamps are a perennial source of water used for irrigating commercial orchards and paddy fields. The filtered water from the swamp is put to domestic use and esteemed for its purity. Water flow through and from the swamp always remains steady: the brooks do not overflow in the rainy season, nor fall dry in summer. The web structure of tree roots facilitates groundwater recharge and prevents soil erosion.

The local people have observed cooler temperatures throughout the year in the swamps compared to outside. They suspect that the regular flow of pure water is caused by the aerial and stilt roots of Dodda patre (*Myristica magnifica* var. *fatua*) and Ondanki mara (*Gymnacranthera canarica*), the key species in the freshwater swamps. A senior member of the *Danmavu* village forest committee noted:

It is a health security issue. We receive clean mineral water throughout the year, naturally from the freshwater swamps and there is no need of energy to pump it out. One should test the quality of the water coming out of the swamp and from other places. We never get sick because of water pollution as people in the cities do, this is the real benefit of the swamp, our policy makers and bureaucrats should think of this and make serious efforts to conserve them. The swamp acts as a sponge, it is a natural reservoir, groundwater gets recharged through these swamps, and we never had a problem of water in our village because of the swamps.

This view is widely shared across the villages. Across all stakeholder groups, the hydrological value of sacred swamps was highly appreciated (see Table 2).

Religious values

Believers frequently expressed the sentiment that the deities protect them personally as well as the entire community. As one temple committee member in *Chaare* said:

We worship the deity in the sacred swamp with due respect and in turn the deity protects us. This regard is to the extent that when the cow does not milk properly, when our cattle gets lost while grazing in the nearby forests, if someone is ill, an infant is sick, or when a small baby from our guest family cries too much when they visit us, we pray to the deity, we offer coconut. We do not enter the forest, but far away in our home only we offer to the deity.

An elderly woman from *Kudgund* said: ‘Nobody should break these traditional laws; entering the forest and collecting the forest resources or polluting inside; we have seen incidents that the deity would become angry and curse them’.

Local residents strongly believe that when the rituals are regularly followed and rules respected, the presiding deity at the sacred swamp protects them from evil and wards off illness. ‘We perform festival (*devara habba*) during the fresh harvest of paddy rice: paddy de-husked at the home front and paddy rice is prepared and then boiled and offered to the deity,’ said a younger man from *Kudegodu*. An 80-year-old believer group member from *Talakeri* said:

I am worshipping the deity for the last 40 years or more. Before that my father was worshipping. Our family is performing this worship since time immemorial and we are continuing this tradition. We continue the rituals and follow what our ancestors were doing. While worshipping we will be fasting from morning to evening. There are few incidences, when people collected fuel wood and green leaf from the [sacred] forest, but many times immediately something wrong happened: cattle got ill or broke their leg or people got sick. Previously, people believed that the presiding deity at the sacred swamp would control even thieves from entering our garden and house.

A woman from *Kaulkuli* said: ‘We worship the deity and our crop and farmland is protected.’ While it is not surprising that believers and temple committee members assigned high religious value to the swamps, it is noteworthy that juveniles also tended to recognize this value (see Table 2).

The score was lowest with migrants. Migrants of the same community of faith or living nearby the swamp are invited to the rituals. For example, in *Kudgund* village, the believers and migrants belong to the same (Haslers) community and the latter are invited to all events. In contrast, migrants from a different faith or religion, as in the village of *Nilkund*, are not invited by the locals and do not follow the sacred swamp rules.

Biodiversity values

Participants in the discussion groups have some sense of species found exclusively in the swamp forests. A senior person from *Talakeri* village said that ‘several species are found only in the swamp forests and nowhere else. Frogs, spiders, birds and butterflies play around here’. In discussion, they named the following plant species (scientific name, endemism and threat status added in brackets by the authors):

- Ondanki mara (*Gymnacranthera canarica* – endemic to Western Ghats and vulnerable as per IUCN red listing),
- Dodda patre (*Myristica magnifica* var. *fatua* – endemic and endangered),
- Kempu Nerlu (*Syzgium travencoricum* – endemic and critically endangered),
- Pandavara adike (*Pinanga dicksonii* – endemic not yet assessed for the IUCN red list)
- Dhooma (*Dipterocarpus indicus* – endemic and endangered)
- Kaanu Holageru (*Semecarpus kathalekanensis* – endemic to Western Ghats, not yet assessed for the IUCN red list)
- Kiral Bhogi (*Hopea parviflora* – endemic to Western Ghats and endangered)
- Kedige (*Pandanus unipapillatus* – endemic, not yet assessed for the IUCN red list)
- Several medicinal plants, herbs and climber species that are endemic to swamps

Especially the village forest committee leaders valued biodiversity (scoring 4), whereas believers tended to recognise special sacred swamp biodiversity somewhat lower (score 3.38), and migrants even less (score 2.5).

Recreational values

Juveniles and women especially most valued the recreational (incl. aesthetic) value of the sacred swamps (with a score of 3.8 and 3.5 respectively). A girl from *Kudegodu* village said that the sacred swamps are a magnificent place to relax. The perennial water, fragrance of flowers, the bees, insects and birds make the place most beautiful in her opinion. An elderly

male local administrator from *Talakeri* village suggested that the sacred swamps could be a perfect natural tourism place. According to both, such recreational activities could be organized without disturbing the traditional rules and regulations and without entering into the core area of the sacred swamps.

Utilitarian value

In the buffer zone NTFPs can be collected by the believers, without cutting the trees. NTFPs are collected from the ground, especially fallen fruits. The believer group does not allow other groups to exploit the natural resources in the sacred swamps. In this way they monitor the ecosystem and participate in the protection of these areas. Still, perception of utilitarian value is rather low in all stakeholder groups, not reaching beyond a score of 3 for any group (see Table 2). The reason is economic: the swamps contain less NTFP than other parts of the forest. ‘Tropical wild fruits like Vaate huli, (*Artocarpus lakoocha*), Arishina gurige (*Garcinia morella*) and the commercially important Raampatre (*Myristica malabarica*), wild bee honey and several other NTFPs are available adjacent to the sacred swamp,’ a NTFP collector woman from *Korse Chapparamane* said. Leaves of *Arenga wightii* (for making brooms), *Pinanga dicksonii* leaves (to be plaited into mats) and fruit rind of *Garcinia gummi-gutta* have a huge market. ‘All these NTFP products are collected in the forests adjacent to the sacred swamp,’ a NTFP collector woman from *Birlakanu* sacred forest added.

Social values

During rituals in the swamp, people from different social and wealth-classes come together. In the discussion groups, it was said that this provides an opportunity to meet, discuss and have a platform for socialization. A middle-aged believer in the village *Kudgund* said:

We worship the *Jatka* and *Beerlu* god and the trees every year on *ellu amavasye* (a new moon day in December or January according to Hindu calendar), we cook the food in the swamp forest and take the lunch there itself, all the villagers take part in this event, neighbours and relatives are invited to attend. In the night also we take dinner together in the village, obviously providing room for socialization.

Scores for this value attained a maximum of 3 and, perhaps surprisingly, were lowest among the VFC group.

Overall Table 2 shows substantial differences between the scores assigned by the various stakeholders. The test for combined column factors, across stakeholders and scores, shows that differences are statistically significant.

4. Discussion

The outcome of our valuation inventory to some extent depends on how the stakeholders are classified and how the various persons assigned themselves to a stakeholder category. A good classification should be mutually exclusive (i.e. classes should not overlap and every person should be assignable to only one category) and jointly exhaustive - the total set of classes should cover all diversity (Gupta, 2007, Moore and McCabe, 2005). However, in the village setting such a sharp, absolute division and assignment are not possible. We tried to mitigate this problem by asking each participant to assign him/herself to the stakeholder category this person represented best. The final assignment was supported by the entire community.

India has a long tradition of sacred ecology (Chandran et al 1998). This tradition is deep, illustrated by sacred forests already being mentioned in the *Rig-Veda* (said to be written about 3000 to 4000 years ago), and their interpretation by contemporary priests, scholars and faith groups. However, we did not focus on the interpretation of texts but – consistent with the sociology of religion (Joas, 2017) – on sacred ecology as a cultural practice, i.e. on the rituals, practices and rules that groups living in landscapes with sacred swamps create and reproduce. The traditional rules are passed on orally in the belief groups. Such self-understanding – as we saw – creates an invisible fence, which protects such swamps from exploitation and pollution, and which appears to be a resilient practice with a long but so far hardly documented history.

Still, such practices are being challenged and threatened: economic development is land intensive and leads to land use changes as an external pressure; associated population dynamics mean that local faith groups live with newcomers around the freshwater swamps, while their own young generation might aspire to lead a different life in the quickly growing urban centres of India.

Our research suggests that within the belief groups a comprehensive understanding of freshwater swamps is alive. It is comprehensive in the sense that the value of sacred swamps is not reducible to direct economic use value but rather present across various aspects of social practices. It is also comprehensive in the sense that sacred swamps are not understood

as a separate entity in the physical proximity to villages, but rather as a place the relation to which is important for well-being (in a wide sense) in the villages.

While the logic of rule transgression and punishment by the gods is magical from an etic perspective of ecosystem service science or from a purely secular perspective, which rejects the idea of deities having causal influence on villages if they are not properly respected, closer attention to the cultural environment shows a significant overlap of religious and other, “secular” values. The ecosystem services of freshwater swamps, for example water purification and provision, demonstrate an important relation between the swamps and livelihood in the village. Indeed, hydrological value scored most highly across all groups. In conjunction with the likewise high score for religious value, our results underscore the importance of a focus on nature’s contributions to people’s quality of life in the new IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) conceptual framework that reflects the importance of socio-cultural relations between people and nature for nature conservation in a specific place (Diaz et al. 2018). Sacred swamp is an example for such a place-based cultural category, which at the same time can be analysed in terms of more general material, non-material and regulative contributions to human well-being. By the combination of focus group discussion and a scoring exercise we have pursued such a two lenses approach (Diaz et al. 2018). The discussion primarily focused on sacred swamps as a cultural category of central importance for understanding the relation between people and nature in a place. The study benefited from the emic perspective of the lead author, who has been raised and who works in the Western Ghats. The scoring exercise provided a tool to track more general, perceived value benefits, even for those not belonging to the faith group. In this more general lense, hydrological and biodiversity values belong to the regulating contributions, utilitarian value to material contribution, and religious, recreational and social value to immaterial contributions. In particular, the manifold biodiversity and utilitarian values open the space for a humble and respectful relation towards systems beyond our full grasp and control – i.e. a relation, which from a different tradition is also evident in the rituals of sacred swamps.

It is noteworthy that even though there was some knowledge on biodiversity, the score for biodiversity value among believers was not high. This suggests an opportunity for scientific and state-organised nature conservation research and policy to draw on the respecting attitude and local knowledge in faith groups to foster deepened and systematised value perception of freshwater swamps.

Our research pointed to a challenge where faith groups intersect with migrants in the villages, and where the latter do not know or respect the sacred swamps. Where newcomers share the faith group, one way of dealing with the challenge (already evident in the villages) is to invite the newcomers to participate in the festivals and rituals. In this way, the tradition can seek to renew itself even in the face of the population dynamics of contemporary India.

However, it may also be the case that old and new villagers do not share the same religion. As the example of the village of *Bogrimakki* shows, this can lead to a radical shift: the culture-sustained invisible fence turns into a visible fence constructed by villagers (with the support of the forest department) to block migrants from entering the swamp.

However, a purely religious justification for such a fence seems both costly and potentially illegitimate. A fence has to be constructed, maintained and policed to protect a deity that has no place in the world of other faith or secular groups. It is therefore noteworthy that secular values such as hydrological, recreational and social values are faith-independent and in this sense more widely accessible. This observation suggests a possible renewal of sacred swamp traditions in a way that integrates and makes explicit such *accessible* values that strengthen the justification of the protection status for non-believers and by implication likely also the acceptance of the local tradition. This would require finding a way in which other faith groups and non-believers can be invited to participate in the swamp rituals on the account of their proximity to the swamp and their membership of the village community, thereby directly fostering social value and indirectly the mutual respecting of religious and other values.

In many countries local traditions are being challenged by westernized urban cultures, so that the institution of sacred groves is losing its cultural importance for the younger generation of local people (Bhagwat and Rutte 2006). Here too our value exploration is interesting: it pointed to a high endorsement of recreational/aesthetical as well as hydrological values of freshwater swamps among the juveniles (who at least in our case are still quite accepting of the religious values as well). Accordingly, and similar to the valuation of the migrants, an emphasis on such accessible, overlapping values might offer an attractive avenue to renew and maintain the tradition of sacred swamps.

5. Conclusions

In this paper, we have explored the values associated with sacred swamps, with an emphasis on their re-production in rituals and practices. In this way, we establish sacred swamps as a – so far mostly overlooked – approach to livelihood preservation and nature conservation.

While sacred swamps are old, they are also under pressure not least due to the economic and population dynamics of secular nation states. We have tried to demystify the perception of sacred swamps as a marginalised vestige of the past via a focus on the rituals, practices and rules of sacred swamps in contemporary India. Consistent with the sociology of religion (Joas, 2017), we found important, extra-ordinary rituals around annual festivals that (re)-establish the shared status of the sacred place, and in this way provide meaning and effect to everyday rules of sacred swamp management via a self-regulating, invisible fence. At the same time, these religious practices make sense as – often no longer recognized, mystified, but originally practical use-oriented – long-term, complex social-ecological experiences of living with an ecosystem with vital supporting, regulating and provisioning contributions to human livelihoods. As a result, there are considerable overlaps between the religious sacred approach and nature conservation as a science-based environmental policy. Accordingly, we conclude our paper with two considerations for policy and further research.

Fostering sacred biodiversity reserves via accessible values in practice.

Our research suggests that sacred status has the potential to conserve freshwater swamps. However, such status cannot be declared top-down; it depends on believers who follow the faith and endorse the practice. Moreover, faith groups are placed, in secular states at least, in a world with other faith groups (and agnostic and atheistic groups). In response, we have explored the heterogeneity of values within a sacred place. It points to what we have called accessible values, i.e. values that are also open to other groups, in our case for example, hydrological, recreational and social values. It is an important policy consideration to explore the potential of such accessible values to foster a dialogue around sacred swamps and their place for livelihoods and nature conservation. For this, we especially emphasise the importance of rituals and shared practices to reproduce and renew such values in practice.

Understanding agency in sacred swamp governance. This article has focused on the rich variety of values around sacred swamps. Such values, and associated practices, are not static. Rather they are reproduced, renewed or discarded by participants of the practice. Moreover,

to address the need to bridge different cultures and stakeholder groups, it would be worthwhile to explore the role of intermediaries in this process: organisations or networks - from government, local community organizations, civil society, science (or hybrids thereof) - which can provide bridges between local traditions and the external pressures of the political economy of contemporary secular states.

Table 1. Name and characteristics of rituals performed in the sacred swamps.

Name of the ritual	Time and importance of the ritual	Activities/traditional laws
Aridra	Annual worship/fair at the onset of the monsoon, normally during first week of June	Believers remove fallen twigs and dry leaves from the area surrounding the stone/sculpture representing the deity. Then the priest cleans the stone/sculpture with <i>panchgavya</i> (a mixture of honey, milk, curd, and cow dung and cow urine), performs the <i>puja</i> with incense sticks, breaks a coconut and again does the <i>puja</i> with camphor. Sweet dishes called ‘ <i>Suttevu</i> ’ and ‘ <i>Payasam</i> ’ are prepared by the belief group, offered by the priest to the presiding deity (an act called <i>Naivedya</i>), and then distributed to all people assembled.
Diwali (Deepavali),	Festival of lights, an ancient Hindu festival celebrated annually in October	Believers clean the area and the priest cleans the stone/sculpture with <i>panchgavya</i> . Then <i>puja</i> and <i>Naivedya</i> are performed to the deity. Coconut and a sweet dish made out of jiggery, rice and cardamom are offered to

		the deity and then distributed to the participants as <i>Prasadam</i> (food sanctified by the god, religious offering consumed by the worshippers after worship).
Makar Sankranti	The transition of the Sun into the zodiac sign of Capricorn (Makara Rashi) celebrated in the month of January	The first harvest of paddy rice is de-husked and cooked near the sacred swamp. The priest prays on behalf of the community for protection of the crops from wild animals and diseases, protection of people from disease and finally for a successful hunt of wild animals (even though hunting is no longer allowed by the state).
Nagara Panchami	The day of cobra worship in the 22 nd lunar mansion (<i>Shravana</i>) of the Hindu calendar	A special <i>puja</i> is offered
Devara Habba	Performed in the swamp during the month of December every year	Worship includes a religious prayer during which the believers offer coconut, flowers, prayer - <i>puja</i> with incentive sticks, <i>dhoopam</i> - a holy fragrance and other offerings to the deity. Some sweet is offered as part of the prayer and then distributed as

		<i>prasadam</i> to all present during the event.
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Table 2. Mean scores (green ≥ 3.5 , yellow 2.5-3.5, red < 2.5 ; with standard deviation) given by various stakeholders (n = number of persons per category) to swamp related values, using a discrete 4 points scale (4 is highest, 1 is lowest). Analysis of variance ANOVA: F is variance ratio, i.e mean sum of square/residual. The numbers in parentheses represent the degrees of freedom (5), the number of observations (n1, n2), and the level of significance (0.01). The ANOVA results show that (as calculated F is greater than tabulated F) the null hypothesis, that scores among stakeholders for the various values are equal, is rejected at the 1% level of significance.

Values	n	Hydrological	Religious	Biodiversity	Recreational	Utilitarian	Social	Analysis of variance (ANOVA)
Stakeholder category								
Believers	13	4 ± 00	4 ± 00	3.38 ± 0.506	2.92 ± 0.277	2.54 ± 0.519	3 ± 0.408	F (5, 72, 0.01) = 36.98
Temple Committee members	9	4 ± 00	4 ± 00	3 ± 00	2.92 ± 0.289	3 ± 0.426	3 ± 00	F (5, 66, 0.01) = 76.89
Women	10	4 ± 00	3.8 ± 0.422	3.1 ± 0.316	3.5 ± 0.527	2.8 ± 0.422	2.9 ± 0.316	F (5, 54, 0.01) = 17.82
Juveniles	11	4 ± 00	3.91 ± 0.302	3.18 ± 0.405	3.82 ± 0.405	3 ± 00	3 ± 00	F (5, 60, 0.01) = 35.893
NTFP collectors	9	4 ± 00	3.27 ± 0.467	3.45 ± 0.522	2.82 ± 0.405	3 ± 0.447	2.82 ± 0.405	F (5, 60, 0.01) = 13.67
Local administrators	9	4 ± 00	2.9 ± 0.316	3 ± 00	2.8 ± 0.422	2.3 ± 0.483	2.3 ± 0.483	F (5, 54, 0.01) = 31.988

VFC leaders	12	4 ± 00	3 ± 0.603	4 ± 00	3 ± 0.426	2 ± 00	2 ± 00	F (5, 66, 0.01) = 107.2
Migrants	9	4 ± 00	2.6 ± 0.699	2.5 ± 0.527	2.4 ± 0.516	2 ± 0.471	2.3 ± 0.483	F (5, 55, 0.01) = 20.139

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