



Stakeholders' involvement and reflections on preserving sacred swamps in the Western Ghats, India, as revealed by participatory visioning

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Abstract

Lack of a shared vision has been identified as a major obstacle in transdisciplinary research involving both scientists and other stakeholders. Without a shared vision, the implementation of scientific findings is difficult. The diverse partners of collaborative research, however, imply a plurality in the valuation of nature and a need for deliberative mechanisms. If visioning processes are to do justice to local contexts, research must apply deliberative mechanisms to cover the plurality in the valuation of nature. This paper proposes a visioning approach for local communities, based on prior transdisciplinary research. This participatory workshop method invites stakeholders to approach nature conservation and livelihoods via a deliberation of desirable futures, barriers for achieving them and associated responsibilities for taking action. The paper explores this method via a case study of visioning workshops on sacred swamps in the Western Ghats (India), and their role for both freshwater swamp protection and livelihoods. The visioning exercise offered discussion opportunities facilitating conscientization, conciliation and collaboration in local bottom-up nature conservation. For conserving the tropical freshwater swamps, the results show the need for a more participatory forest governance, providing space for shared value creation. They also point to the need for further research on inter-faith nature conservation possibilities, along with innovations on value addition and value chain development for livelihood promotion and protection.

Keywords Biodiversity assessment · Collaborative knowledge production · Freshwater swamps · Sacred swamps · Nature conservation · Visioning workshops

Introduction

The 2019 Global Biodiversity Assessment found “nature to be declining less rapidly in indigenous peoples’ land than in other lands” but to be “nevertheless declining, as is the knowledge of how to manage it” (IPBES 2019, p. XVIII). These results highlight the need of context-specific

knowledge and action of local communities and indigenous people to tackle sustainability challenges (Maclean et al. 2022). For transdisciplinary research on biodiversity and livelihoods, co-producing context-specific knowledge and action depends on the active involvement of such communities (Hill et al. 2022). Moreover, visioning has been identified as an important element linking assessment and action in such research (Salafsky et al. 2002). Lack of a shared vision and mission in transdisciplinary research is often a major obstacle for implementing scientific findings (Brouwer et al. 2017; Ferguson et al. 2018). However, if visioning processes are to do justice to local contexts, research must apply deliberative mechanisms to cover the plurality in the valuation of nature (Pascual et al. 2021). So how can sustainability scientists involve diverse, local communities in visioning processes for biodiversity and livelihood protection? And what are the results of such processes?

This paper analyses a series of participatory workshops, in which local communities evaluated biodiversity

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conservation and livelihood protection in sacred swamps in the Western Ghats (India). It presents a new adaptation of a transdisciplinary method (cf. Bennett et al. 2010; Bammer 2017) to a local context of biodiversity and livelihood protection and analyses the results of this transdisciplinary process. Stakeholders were invited to deliberate on desirable futures, implementation barriers and associated responsibilities for action. Sustainability scientists moderated the process and offered input on ecosystem functions and local traditions, using both a generalizing and a context-specific perspective. Such a “two lenses” approach (Díaz et al. 2018), which acknowledges the biophysical qualities of sacred swamps as well as the values and practices that local communities associate with them proved valuable in the extant research on sacred swamps (Hegde et al. 2018, 2020; Hegde and Joosten 2023). The research shows that there is no “unitary view” on the values of sacred swamps (cf. Pascual et al. 2021): local belief groups and their traditions meet with the beliefs and practices of more recently arrived people, who might neither share nor even be aware of sacred swamps (Hegde et al. 2020). The similarities in valuation suggest that the generalizing perspective of ecosystem services might foster the dialogue across stakeholder groups on sacred swamp protection. Such accessible values, i.e. values that are open to other groups, might be mobilized to envision and plan for livelihoods and nature conservation (Hegde et al. 2020). However, the differences in valuations also indicate the limits of this perspective.

After introducing the conservation and livelihood aspects of the sacred swamps of the Western Ghats, we present our visioning method and the results of the participatory workshops. Finally, we discuss process and results in light of the predicament that local communities and indigenous people are important for biodiversity protection, yet themselves under pressure from global socio-economic trends towards unsustainability (IPBES 2019).

Concepts, methods and study area

Case study area

The Western Ghats Mountain ranges, running parallel along the west coast of India, constitute one of the eighteen “global biodiversity hotspots” due to their large number of endemic biota and the scale and speed of their current habitat loss (Myers et al. 2000). The mountain ranges support—together with Sri Lanka—about 4780 vascular plant and 1073 vertebrate species, of which, respectively, 2180 (i.e. 0.7% of the world’s plant species) and 355 species (i.e. 1.3% of the global vertebrate species) are endemic. Uttara Kannada (13.85°–15.7166° N, 74.166°–75.2833° E) is one of the most

densely vegetated districts (81% of geographic area under forest cover) within the Western Ghats.

The highly biodiverse freshwater swamps of this mountain chain (Chandran et al. 1999) are the result of a coevolution between swamps and local people. Therefore, both biological and cultural aspects need to be studied to inform appropriate conservation practice (Caillon et al. 2017). We focus on sacred swamps, which are freshwater swamps dedicated to worship one or several deities through long-term commitment and traditional laws and practices (Hegde et al. 2020).

The location of the study area is shown in Fig. 1A. We used European Space Agency Sentinel-2A data of 10-m resolution to map land use and land cover (LULC) applying a supervised classification algorithm in the cloud platform Google Earth engine. Figure 1B shows the visual interpretation of the relationship between sacred swamp locations and environmental variables such as drainage and vegetation in false colour composite, whereas Fig. 1C shows them in true colour composite (the legend is for Fig. 1C). The figure shows that most sacred swamps are situated adjacent to the drainage network (stream) with dense vegetation.

Our prior research showed that sacred swamps in the Western Ghats have biophysical features that distinguish them from other freshwater swamps: they occur only in wet evergreen forests, are located closer to roads, human settlements and commercial orchards and have a larger number of plant taxa, critically endangered, endangered and vulnerable species and a higher density of amphibians compared to non-sacred swamps (Hegde et al. 2018; Hegde and Joosten 2023).

We also studied the rituals, practices and values of the stakeholder groups living around and with sacred swamps (Hegde et al. 2020): entry to the core area of sacred swamps is permitted only during annual worship and under strict rules; the priest and people who look after the swamp must take a bath, wear clean clothes and perform a ritual prayer; within a buffer zone around the core zone, it is forbidden to cut trees and twigs, pick flowers, collect leaves and dead wood, hunt, gather and fish, erect constructions and perform any activity that may pollute the water body; and the collection of non-timber forest products is confined to the relevant belief group. Compliance with these rules is observed by the community. The formal jurisdiction of these swamps rests with the State Forest Department, who owns the land (Hegde et al. 2020). The traditional rules, orally transferred by the belief group, maintain an “invisible fence”, which protects the swamps while also allowing for some regulated economic and cultural activities.

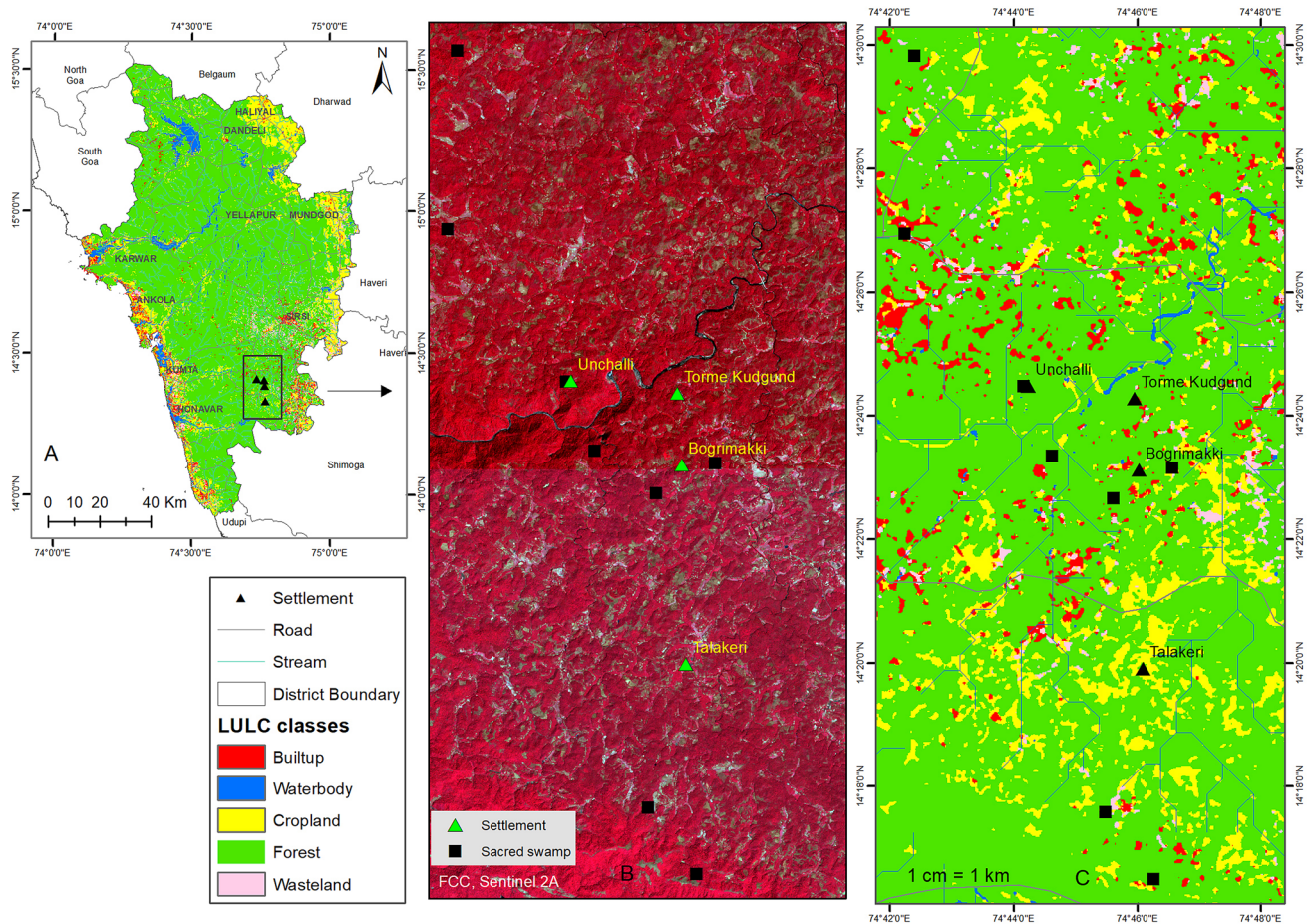


Fig. 1 Map of the sacred swamps and workshop places in Uttara Kannada

Participatory visioning workshops

Conservation science has long stressed the need and challenges of linking conservation assessment to effective action (Ehrenfeld 2000) and has identified critical roles and skills for that purpose, such as visioning and strategic planning (Salafsky et al. 2002). Efforts in visioning and planning must combine conservation research with discussions and consideration of livelihoods in context (IPBES 2019; Maclean et al. 2022; Hill et al. 2022). Lack of a shared vision is a major barrier in transdisciplinary research involving scientists and other stakeholders (Ferguson et al. 2018) and pertains specifically to the implementation of scientific results (Brouwer et al. 2017). Since contexts are not homogeneous but rather bring together different stakeholders, deliberative and inclusive visioning methods are needed that acknowledge the diversity of perspectives and interests. This section introduces how we drew on the literature for the design and organization of participatory visioning workshops to clarify our central concepts and methods.

Visioning is an element of foresight (Popper 2008), which emphasizes the need to look beyond the ever-pressing concerns of the moment, to identify desirable directions and elements in medium- or long-term perspective and to foster ownership of strategies and clarification of responsibilities for getting there. During visioning exercises, participants are encouraged to deliberate about future possibilities: the values and desirability of visions, planning and participation possibilities as well as obstacles (Evans et al. 2006). Visioning is a goal-setting exercise that encourages creative thinking, makes expectations more explicit and identifies areas in which stakeholders are in agreement or conflict. Visioning seeks to create spaces for reflection where people feel free to express their hopes and fears and to articulate their aspirations and dreams (Evans et al. 2010).

We scanned the transdisciplinary sustainability methods literature (Bammer 2017) for participatory visioning methods and used an approach proposed by Bennett et al. (2010). The approach consists of four stages: (1) fast forward to the future: 5 years from now, what would count as a success? (2) What are the barriers to achieve this

accomplishment? (3) Who owns the barriers? (4) What will we do to remove the barriers (taking responsibility)? During visioning exercises, participants are encouraged to deliberate about future possibilities in a long-term perspective: the values and desirability of visions, planning and participation possibilities as well as obstacles (Evans et al. 2006). We developed a participatory visioning method that combines this future-oriented deliberation of sustainable use options and responsibilities with inputs on ecosystem services and cultural practices.

Stakeholders were invited to deliberate on desirable futures, implementation barriers and associated responsibilities for action. Sustainability scientists moderated the process and offered input on ecosystem functions and local traditions, using both a generalizing and a context-specific perspective by acknowledging the biophysical qualities of sacred swamps as well as the values and practices that local communities associate with them. This double approach was to acknowledge and advance the “two lenses” approach (Díaz et al. 2018) that informed the Global Biodiversity Assessment and subsequent development to integrate nature’s contributions in support of biodiversity and local communities. As freshwater swamps are for many members of the local community part of the bigger issue of forest management, the workshops allowed space to discuss long-term forest management and how forests are currently governed.

In June and July 2020, four workshops were organized near the sacred swamp regions (for the four locations see Fig. 1C, and for the structure of the workshop - Supplementary Appendix 1). Workshops were facilitated by the main author and supported by at least one colleague who helped with the organization and recorded the discussion in writing. The workshop moderators initiated a discussion and invited the people to think about their relation to the swamp, the future of sacred swamps and that of freshwater swamps more generally. Participants were encouraged to imagine success factors of swamp and forest restoration during the next 5 years, to identify present threats and problems and to make suggestions for dealing with them (“owning the barriers”).

Our workshop method combines different roles of sustainability scientists (Wittmayer and Schöpke 2014): the role of reflective scientist sharing information, such as on the ecological properties of freshwater swamps and their functions, and the role of the process facilitator bringing together different stakeholders in the visioning exercise. Clarity about these roles is important in light of the colonial heritage of science working with local communities and indigenous peoples (Maclean et al. 2022). The role of scientist comes with an epistemic authority, which influences subsequent debates. Therefore, facilitating and documenting the workshops as process moderators, a special effort was made to

ensure that all stakeholders were invited and that all voices were equally heard.

Stakeholders in our method are defined as social groups that depend on swamps directly or indirectly in various ways and formally or informally influence or get influenced by swamp management and governance. The stakeholder categories were drawn from prior research on sacred swamps: (1) believers, (2) temple committee members, (3) non-timber forest products (NTFP) collectors, (4) women, (5) village forest committee (VFC) leaders, (6) local administrators, (7) migrants and (8) juveniles (Hegde et al. 2020; for a description of these groups see also next section). Some stakeholder groups are not mutually exclusive and overlapping interests between groups will become apparent in the visioning process detailed below. Finally, our participatory visioning approach implies that scientists in this exercise are an additional 9th stakeholder. As outlined above, this stakeholder in the workshops has the role of a reflective scientist (sharing results of research on ecosystems services, their valuation and cultural practices) and of a process moderator. Acknowledging this leads to a further role of “self-reflexive scientists”, aware of their position as participants in the process (Wittmayer and Schöpke 2014). We return to this in our discussion (“[Process of stakeholder engagement and governance](#)”).

“Visioning” in our method does not imply or aim for the creation of a unitary worldview. Rather, the workshops are designed as a space for stakeholders to explore collaboration, identify bottom-up desirable action possibilities and discuss responsibilities and ideas for moving forward in their context and “place” (Baker and Mehmood 2015). Since freshwater swamps are, for the local communities, part of the bigger issue of forest management, the workshop organization deliberately left space to discuss their interests in long-term forest management and how forests are currently governed.

“Participation” of stakeholders may range from merely being informed to having a real opportunity to participate in decision-making (Arnstein 1969), also referred to as empowerment. The participatory workshop method is designed to empower stakeholders directly and indirectly. *Directly*, via the conscientization process (Ibrahim 2017) triggered by the visioning, participants are presented with research findings about freshwater swamps and invited to reflect on desirable futures of living with these swamps, as well as via the conciliation process (Ibrahim 2017) enabled by the joint deliberation of not only the desirable future, but also of the barriers, interests and responsibilities for moving in a desirable direction. It also empowers *indirectly*, because the participatory process surfaces the role of public and private actors and thus helps clarify collaboration possibilities and barriers with established actors. We documented the results of the visioning, as well as the identification of barriers and responsibilities of stakeholders (presented in

“Results”), and discuss the limits of this empowerment process in “Discussion”.

Workshops were recorded in Kannada, the main language of the villages and subsequently translated into English. Each workshop lasted about two-and-a-half hours (ranging from 125 to 225 min). 88 participants attended the workshops, ranging from 18 to 28 participants per workshop (see Table 1).

After the workshops, minutes were analysed on how the participants had contributed to visioning, identified barriers and opportunities, and handled the generalizing ecosystem services and contextual sacred swamp knowledge during the discussions. Heeding the call for polyvocality and respect for the diversity of perspectives (Maclean et al. 2022; Johnson et al. 2016), we opted for a presentation of results that puts the emphasis on the diversity of concrete discussion inputs rather than on an attempt to generalize more abstract visioning results.

The COVID-19 pandemic complicated the organization. Workshops were repeatedly delayed, less people participated than expected and, in line with the general pandemic trend (Maclean et al. 2022), more work was done by local researchers and organizers since co-authors from abroad could not join. Participants faced uncertainties on the impact of the virus on livelihoods and socio-economic conditions, which made the process facilitators decide to give more space to these pressing concerns. Rather than following the initially planned structure “by the letter”, the workshops were conducted in a flexible manner, i.e. with space for improvisation to advance the workshop objectives while ensuring that the structure was responsive to the needs and interests of the participants. Due to time and participant constraints, the initial plan of having separate discussion groups per stakeholder group had to be abandoned in favour of joint cross-group discussions.

Results

We first present the main points of the discussion on the visioning, followed by a presentation of the perceived barriers and success factors across the various stakeholder

groups. We conclude with a summary of the reception of the ecosystem service perspective and associated value scoring. Table 1 provides an overview of workshop locations, participants, dates and duration. Figure 2 provides an overview of the participatory visioning process and visioning results presented in the following subsections.

Visioning workshops

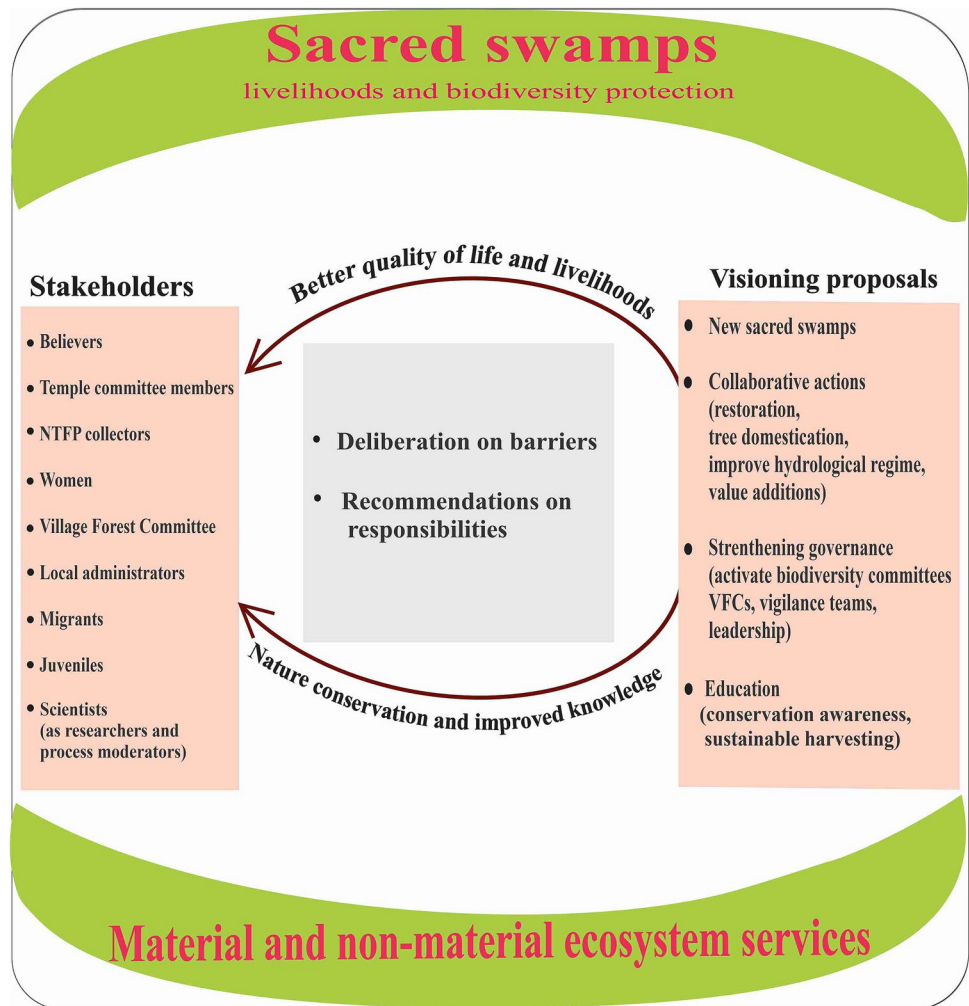
Location: Kudgund

In the *Kudgund* workshop, participants were particularly concerned with the expansion of commercial orchards into the swamp forests. In addition to reducing the water purification capacity, the expansion also increased water diversion from the swamps. Women group members were concerned about the disappearance of medicinal plant and wild food species. It has been generally observed that the forest cover in the catchment area is shrinking and no local self-governing body (“grama panchayat”) is taking responsibility. In response to these issues, the participants envisioned that a new sacred swamp should be declared, which would extend the swamp forest region under protection and community control. Migrants and households, settled recently in the village, would be part of the sacred swamp system. In addition, the group proposed to reactivate the Biodiversity Management Committee (BMC), which any local self-government may constitute according to the Biological Diversity Act (Government of India 2002). The BMC helps to document all plant and animal species through a peoples’ biodiversity register. Each *grama panchayat* should have such committee, so that better knowledge of species and resources and a more sustainable management are guaranteed. Participants from *Kudgund* also proposed to plant various *Ficus* species in the catchment area, since they are perceived as hardy plants and well suited for reducing soil erosion. They also proposed obligatory swamp species, e.g. *Myristica fatua*, *Gymnacranthera canarica*, *Pinanga dicksonii*, *Lophopetalum wightianum* and *Mastixia arborea* to be raised in the nursery and planted in the swamps, together with the village forest committees and the State Forest Department. Participants also proposed to establish soil and moisture

Table 1 Overview visioning workshops

Workshop location	Villages attending	Sacred swamps involved	Stakeholder groups present	Number of participants	Date	Duration (min)
Torme	Kudgund	Keremoole, Birlakanu, Kudgund	All 8 groups	22	8.6.2022	135
Unchalli	Unchalli, Nilkund	Chaare, Nilkund, Chowdikanu	All except migrants	20	20.6.2020	125
Talakeri	Talakeri, Danmavu, Kudegodu	Kudegodu, Devikanu, Jaddikodlu, Kudegodu	All 8 groups	28	4.7.2020	225
Bogrimakki	Bogrimakki	Bogrimakki	All 8 groups	18	18.7.2020	150

Fig. 2 Participatory workshops and visioning elements



conservation structures (like percolation pits, check dams, gully plugs) in the adjacent swamp forest catchment. The women group members said that in the past they had participated in nursery establishment and swamp restoration activities and that such programmes should be reinstalled. The youth participants suggested that flagship species (lion-tailed macaques, king cobra, tiger and great pied hornbill) could be used to foster eco-tourism as an income generation possibility. They also argued that sustainable NTFP harvesting methods should be promoted.

Location: *Unchalli*

In the *Unchalli* workshop, the participants were concerned about forest degradation resulting from population growth. Migrants had settled in the village. Over-harvesting of the forest resource and climate change had led to crop failure. The participants had already observed the disappearance of swamp species, and our introductory presentation of research results during the workshop confirmed the gradual disappearance of indicator species of forests and swamps. In

response, workshop participants' visioning focused on protecting the existing sacred swamps. In their vision, regular planting in the swamps and degraded forests should assist the natural regeneration of climax evergreen species. The goal should be to maintain the species that are exclusively found in the swamp forests and adjacent tropical forests. In addition, they envisaged more education and awareness creation about the economic value of biodiversity and the sacred swamp tradition. Information on forest-based enterprise and its dependence on conservation should promote the long-term involvement of local communities.

Location: *Bogrimakki*

In the *Bogrimakki* workshop, participants argued that the responsibility for forest management and livelihood activities is not clear and that there is no village forest committee (VFC). Participants observed the decline of pollinators, especially honeybees, which they linked to climate change, forest loss and the decrease in wild fruits and species that provide pollen and nectar. Participants did not want to engage in a

visioning process focused on sacred swamps. They called for a discussion of forest management. They emphasized that the swamps are part of the forest and stressed the importance of the forest for the village, especially as an abundant source of fuelwood. Participants envisioned a forest management with clear leadership and responsibilities. They decided that establishing a VFC is a priority. In addition, their vision included a list of swamp protecting activities: the installation of fuel-efficient ovens and driers, the nursery raising and planting of typical swamp, bee-feeding and medicinal plants, education and conservation awareness raising about swamps and their species (including endangered and endemic species), the promotion of sustainable harvesting methods for NTFPs (notably honey, forest fruits and medicinal plants) and the integration of locally harvested and value-added products into the market to improve economic returns.

Location: *Talakeri*

In the *Talakeri* workshop, the participants were concerned about the decrease in evergreen forest, the increase in monoculture plantations and invasive species (such as *Eupatorium* and *Parthenium*), and the disappearance of (mostly medicinal) plant species. The vision of participants focused on conservation actions. They proposed the formation of a vigilance team to prevent expansion of agriculture land into the swamp area and “unscientific” harvesting of forest resources (by this, they meant premature harvesting, over-harvesting and cutting branches and twigs while harvesting). They also envisioned the expansion of the swamp and evergreen forest through active planting (such as with *Ficus*) and measures to improve groundwater discharge, e.g. spring rejuvenation. They emphasized the need to assist natural tree regeneration by seedling protection, sowing or planting and lessening the pressure from harvesting, so that reproductive propagules are available for natural regeneration. They proposed establishing a medicinal plant garden and better disseminating traditional knowledge on medicinal plants and herbal medicines. Participants stressed that this could also generate cash income via value addition and value chain development, including by improved processing and product development of medicinal plants and other forest resources and direct marketing to companies or end users.

Stakeholder groups: perception of barriers and opportunities

This section presents the results of the workshops in relation to the various stakeholder groups and their perception of barriers, opportunities and success factors. Drawing on prior research (Hegde et al. 2020), the following stakeholder groups were distinguished.

Believers

Believers are the people living near the swamps, who worship the swamp as sacred and preserve the tradition. They have a religious (Hindu) motivation to protect the sacred swamps. This group has limited control of the swamp in legal terms. The link between the sacred swamp tradition and the general discussion of benefits from ecosystem services and forest governance is important for this group, since it might facilitate the collaboration with formal institutions in the village, as well as with the State Forest Department.

Temple committee members

Temple committee members are (only) men responsible for the management of local temples. In principle, they are motivated to support the sacred swamp tradition as part of their spiritual activities. Committees tend to be well organized and have a long-running work experience that includes good knowledge about forests, species, nature conservation threats and possible solutions. However, sacred swamps are not a priority. While the knowledge and motivation of this group provide an opportunity for the management of sacred swamps, their practical focus on temples provides a barrier.

NTFP collectors

NTFP collectors, by majority are locals, with marginal or no land holding. Their livelihood depends on NTFP gathering and farm labour for others. They collect hundreds of NTFP species for household and commercial purposes. Some NTFP collectors are also believers. For this group, the swamp forests are an important and rich livelihood basis, especially in light of frequent crop failures. Economic pressure and lack of knowledge can lead to the “unscientific” harvesting noted above. A key success factor for this group is good training in sustainable NTFP harvesting methods and opportunities for primary processing and value addition in the villages. Such demonstration and infrastructure can be established under the village forest committees (VFCs), which promote forest-based sustainable enterprises. Collectors play an important role in forest management, replanting and pressure reduction, where agro-forestry practices and plant domestication become available as an alternative.

Women

Of the 88 participants, only 22 were women. This stakeholder group named physical distance, in addition to the pandemic, as a further barrier to their participation. This barrier is in part a result of the patrilocality reported below. Women produce agricultural and horticultural crops for livelihood and cash income. Some women are also NTFP

collectors, including from the buffer zone of sacred swamps. Many women are also believers. Women are often knowledgeable about plants and animals. In the workshops, they voiced their concern about the decline in forest cover, wild foods and medicinal plants. Women group members participated in the organization of consultative workshops aimed at conservation and sustainable management of freshwater swamps. They reported that such workshops yielded subsequent conservation activities in and around the swamp forests. However, patrilocality restricts the movement of women, and they are usually excluded from forest management and religious institutions. Lacking facilities (machinery and other infrastructure) reduces their opportunity to create value-added products from crops locally and to market those products. The creation of exclusive women self-groups can facilitate their agency. In general, this group seeks better inclusion in the village organization of forests, swamps and livelihood protection.

Village forest committee (VFC) leaders

VFC leaders are elected by the residents of the village. All villagers, including women and migrants above the age of 18 years, are members of the VFC. The committee is formed under the Joint Forest Management Programme (JFMP) created under the Forest (Conservation) Act 1980. The objective is to ensure participation of local people in the conservation and management of forests in the village in cooperation with the State Forest Department. VFCs are exclusively mandated to work on conservation and livelihoods with statutory recognition by the state. In principle, VFCs can play an important role for freshwater swamp and livelihood protection. In practice, not all villages have VFCs, and they are not always well organized. Participation is voluntary and leaders tend not to be trained in the management of natural resources. The workshops revealed that VFC leaders are not directly involved in the management of the sacred swamps. They think that VFCs are responsible for managing only the degraded forests (planting, managing the planted forests and harvesting and revenue generation). If the capacities of VFCs are strengthened, by providing need-based trainings, awareness about their powers and how to execute them, they can play a prominent role in organizing conservation action, sustainable harvesting and trading, and in linking the sacred swamp tradition with the structures of the state and the respective Forest Department. This would also help the VFC leaders to take a pre-emptive approach and protect forests and swamps that are not yet degraded.

Local administrators

Local administrators are members of the *grama panchayat*, the local governing body, which is elected to implement

rural development activities in the village. Local administrators have no direct relation to the sacred swamp, but are sometimes believers and usually have links to political parties. Biodiversity and sacred swamps are rarely a priority, Talakeri village being an exception. In the *Talakeri* workshop, the local administrators appeared to be knowledgeable about forest and species, possibly because they work closely with local herbal-medicine collectors and belief groups. For example, they mentioned locally extinct bird species, such as *Gyps indicus*, and endangered and endemic species like lion-tailed macaque (*Macaca silenus*), and suggested spring rejuvenation and other challenging works of forest conservation. Local administrators play an important role in political decision-making and hence potentially also for mobilizing investment for swamp restoration and conservation. The ecosystem service perspective might play a supporting role, explaining to this group the link between sacred swamp preservation and ecosystem services, such as water retention and purification and income generation linked to the provisioning services of swamps and forests. The example of Talakeri, however, suggests that local interaction is just as important.

Migrants

Migrants are people who have settled in the villages during the last 15 years (about 10–15% of the overall population). Many of them have converted forest and grazing land to agriculture and some purchased land in the villages. The newcomers' awareness of local tradition and social practices is limited. They also experience distrust by the locals and are rarely included in decision-making processes. This enforces the impression that they have less interest in conservation-related activities. There is a need to differentiate between migrants with and without the same faith background as locals. For those of the same faith, an inclusion in the sacred swamp tradition is in principle possible and they saw the proposal of a new sacred swamp in one workshop also as a real possibility. Paradoxically, thus, the establishment of "new" sacred swamps makes the tradition more inclusive. However, the division of Hindu and Muslim groups proved to be a barrier that could not be bridged in the workshops. Still, it is possible to integrate Muslims in the village governance structures (VFC, local administration) along with awareness raising and providing technological substitutes (such as fuel-efficient devices) to reduce pressure from wood collection.

Juveniles

Juveniles are aged below 21 years. They participate in development activities in the village, sometimes with various state departments, and in social activities. This group faces economic pressure and often migrates to the city in search

of opportunity. In the workshops, the juveniles revealed an interest in both the traditional values of swamps and the economic value of ecosystem services, including identifying local biodiversity and linking it to income generation (ecotourism and farming).

Sustainability scientists

The process facilitation was done by the lead author, who was born and raised in the Western Ghats and continues to work there as conservation activist and farmer, while simultaneously doing research on the ecology and culture of freshwater swamps. As process facilitator, the lead author did not actively contribute to the content proposals made during the visioning process, but rather facilitated and documented the discussion (with the support of a colleague). Moreover, the sustainability scientist had a preparatory role as reflective scientist providing initial input on what is known about the sacred swamps, their ecosystem services and the cultural practices.

The generalizing perspective of ecosystem services and stakeholders

The introductory presentation of the generalizing perspective of ecosystem services and landscape features of sacred swamps, as well as of the contextual sacred swamp traditions was welcomed in three out of four workshops. The exception was the workshop in *Bogrimakki*, where participants did not want to focus on sacred swamps but to discuss forest management, since they felt that there was a leadership and responsibility problem.

Throughout the workshops, the main interest was in the hydrological function of the swamp, which was unsurprising in view of prior research, which showed this function to be valued highly (Hegde et al. 2020). More surprising was the sustained interest in biodiversity value, which had previously scored low (ibid.). Participants wanted to know in detail about the species, with most interest in the fauna. Participants tended to respond to the reported presence of endangered and endemic species in their areas as something to be proud of.

The presentation of sacred swamps rituals and practices was also appreciated, however, with little indication that this might lead to participation in sacred swamp practices of those that are currently not participating. Rather, the information was welcomed, specifically by the juveniles, as an opportunity to learn about tradition and link it to the nature conservation and livelihood debate. There was, however, one exception: the plan to create a new sacred swamp in *Torme*. Prior research had indicated a lower religious value attribution among migrants (Hegde et al. 2020). The *Torme* workshop suggested that a reason for lower valuation might

be the exclusion of migrants from sacred swamp-related activities. In the *Torme* workshop, the migrant participants showed direct interest in creating a new sacred swamp. This new activity proved to be an opportunity for more inclusion, thereby also showing that existing sacred swamps tend to exclude if they are perceived as the tradition of and for those who have lived there for a long time. Migrants, even of the same faith group, do not participate in already existing sacred swamp activities.

During the workshops, participants mentioned 89 landscape elements and 95 species explicitly. We documented their perception by stakeholder group and in relation to the highlighted provisioning, regulating and non-material (cultural, aesthetic) ecosystem services (De Groot et al. 2002). In a further step, we linked the services to the regulatory and customary rights as well as to the recommendations made by the groups in the workshops (see Table 2). The analysis shows that even though migrants depend on swamp provisioning services, this is not reflected in their institutional inclusion and involvement. As suggested by the *Torme* exception, this blocks their active role in conservation activities. The analysis also shows that while women have a formal right to participate actively in the VFCs, more efforts must be made so that they have a real opportunity to participate. Complementing the political opportunity, this stakeholder group also needs better economic opportunities to add value to forest products. The analysis also shows that juveniles are not recognized as such, even though they show an interest in both the religious sacred swamp and the generalizing ecosystem perspective. Moreover, the critical role of the Forest Department became apparent. One of the participants said: “There is lack of transparency in the planting activities undertaken by the State Forest Department. They do not plant suitable swamp species; it appears that they do not have the expertise and technical knowledge. Last year, we saw many seedlings just thrown in the forest; maybe they have claimed money for planting them.” Another participant expressed: “Rattan resources have declined. Forest Department have given the contract to extract rattan... We think more than 80% of the resource are now depleted”; and another: “Forest Department has planted monoculture plantations of Acacia” (in the forests adjacent to the freshwater swamp area).

Discussion

Process of stakeholder engagement and governance

Sustainability science seeks to improve science and politics by understanding and including local knowledge and extended peer communities (Funtowicz and Ravetz 1993). For this purpose, natural and social scientists are called to

Table 2 Stakeholder groups, highlighted ecosystem services, relevant rights and workshop recommendations

Stakeholders	Ecosystem services highlighted	Regulatory and customary rights	Recommendations from the stakeholder group
Believers	Non-material: cultural and spiritual values	To enter/worship/manage the forest through customary rights	Link the belief group with VFCs and local administrations to increase participation
Temple committee members	Non-material: cultural and spiritual values	Similar to believers as they are also faith based	Declare swamps as sacred and provide religious services
NTFP collectors	Material: provisioning services	To collect resources in the periphery of sacred swamps	Improve conservation and livelihoods through NTFP resource augmentation and value addition
Women	Material: provisioning services	Some access to the products in the buffer zone for domestic consumption	Participate actively in the management through VFCs. Strengthen value addition of forest products
VFC representatives	Material: regulating services	To execute nature conservation activities by statutory means	Improve hydrological regimes, conserve biodiversity
Local administrators	Material: regulating services	To provide monitoring and (through BMCs) legal support for nature conservation activities	Influence political decision-making in the allocation of investments to enhance conservation outcomes
Migrants	Material: provisioning services Potentially non-material (at least for those of same faith group)	Hindu faith groups: to exercise democratic rights (<i>de jure</i> and weaker <i>de facto</i>) via VFCs and local administration Muslim faith groups: <i>de jure</i> rights and <i>de facto</i> absent rights in VFCs and local administration	Forest-based enterprises: reduce pressure on the forests for fuel wood and other resources
Juveniles	Material and non-material: provisioning services; and non-material (aesthetic, cultural)	<i>De jure</i> rights via VFCs, <i>de facto</i> limited inclusion and recognition	Increase conservation awareness, link eco-tourism with conservation

collaborate in inter- and transdisciplinary projects to benefit from the ideas and critical reflection that such inclusion can promote (Ziegler and Ott 2011). Such collaboration makes the role of scientists more complex. Next to functioning as reflective scientists, who seek to gain and expand objective knowledge, and as process coordinators of workshops, they also have to be self-reflexive and revisit critically these other roles (Wittmayer and Schöpke 2014). For reflective scientists the “sacred swamp” is already a humbling complex research object. However, as process coordinators, the need for additional humility regarding this research object became evident. For many stakeholders, it was the “sacred-swamp-in-the-forest” or simply the forest that was the relevant unit of discussion. While sacred swamps provide a well-defined object to discuss ecosystem services from both a generalizing and a local perspective, there was a need to consider this object in context and the various ways in which it matters to different stakeholders.

Our visioning workshops benefited from the trust created by prior conservation initiatives of the main author, illustrating that effective process facilitation is a long-term and not merely an event-specific activity. Even though we made an effort in the preparation of the workshop to reach out to all stakeholder groups, our visioning workshops failed to achieve the participation of non-believer migrants and Muslims. A possible reason is that the workshops were perceived as based on the Hindu belief system in an exclusionary way. Yet, the composition of groups and their preferences strongly impacts outputs and outcomes of participatory processes (Newig and Fritsch 2009). While the importance of faith-based groups in restoration is increasingly recognized (Interfaith Rainforest Initiative 2021), our workshops underscore the particularistic tendency of faith groups and the challenge of organizing shared action across faiths. More research and practical experimentation are needed to work on inter-faith collaboration.

Different visions and implications for local stakeholders and their agency options and responsibilities for the protection of nature and livelihoods emerge from the workshop discussions. One group envisages a new sacred swamp, while another does not even want to talk about sacred swamps (but prefers a more general focus on forests). One group wants to protect existing sacred swamps better and for this purpose emphasizes economic opportunity creation, while another group focuses more on nature conservation. The level and articulation of interests in nature conservation varies with the socio-economic and spiritual dependence on the sacred swamps in the respective context. The visioning workshops and action proposals thus demonstrate the importance of avoiding a one-sided, nature-conservation-only perspective on sacred swamps and of also paying attention to basic needs, livelihood security and income generation. This is a strength of the method in light of the call for

more polyvocality (Maclean et al. 2022). Throughout the workshops, participants pointed out ideas and needs to link swamp protection, sustainable harvesting and forest management to income and livelihood security. While non-material values play an important role for catalysing indigenous and other local management, visioning and action promotion is only constructive if basic material needs are satisfied and included (Sarkki et al. 2019). It is noteworthy that the workshops created space for a wealth of livelihood and income generation related suggestions: establishing medicinal plants garden, learning about wild foods, NTFP harvest and value additions, eco-tourism, taking care of honeybee populations, reducing the incidences of crop damage by wild animals, etc. In short, rather than juxtaposing the spiritual and the economic, the visioning exercise creates a space for exploring their interconnection for the local community.

Across workshops, the absence of an effective governance system involving user groups and the Forest Department was pointed out as a major problem for swamp conservation and restoration. Participants identified a need to better include local organizations (such as the VFCs) and user groups in management and governance, and to link restoration to the promotion of sustainable livelihoods. Far from viewing “sacred swamps” as something to be protected passively through prohibitions, the workshops emphasized active support, notably via planting and spring rejuvenation. Oral history narrated by the participants revealed that some non-sacred swamps (such as *Attigeri Jaddi*), but none of the sacred swamps, have disappeared, indicating the relevance of spiritual value for the conservation of swamps.

Collective discussions and action plans need to be further implemented along with agencies like the State Forest Department, the State Biodiversity Board and other line departments. Social learning is necessary but collaborative management also requires capacity, appropriate processes, networking and supportive state policies to sustain joint action (Schusler et al. 2003). Throughout the workshops, collaboration (in the sense of working with further institutional actors) was an important topic. In particular, the State Forest Department emerged in the discussions as a crucial actor for collaboration. The observations by participants regarding the lack of transparency within the Forest Department point to the danger that options identified in the visioning process will be captured by elites (Ibrahim 2017). State policies and programmes need to be linked with bottom-up stakeholder groups and local democratic organizations, a task significantly beyond the visioning workshops. In short, participatory methods such as visioning workshops must be put into a larger social and temporal context.

The Joint Forest Management Program envisages the State Forest Department and the village community to share responsibility of forest protection and management. A defined forest area adjoining the villages is outlined for the

collective management and revenues derived from these land areas shared between the two (Government of India order 1990). The two local democratic bodies, the VFC and *gram panchayat*, are, however, not directly involved in any kind of protection and management of swamp forests. VFCs and the Forest Department tend to focus only on degraded forests and NTFP collection and management in undegraded forests. The *grama panchayats* tend to focus on rural development, especially infrastructure development, again without a focus on swamp forests and sacred swamps. There is a need for enhancing the community role in biodiversity research and conservation management (Hegde et al. 2017).

Perspectives on ecosystem services

The generalizing perspective of ecosystem services, including biodiversity (endemic, critically endangered species and the unique conservation significance as special habitat), has—despite the low score for biodiversity in prior research (Hegde et al. 2020)—been received with great interest and even pride. This shows the importance of not treating valuation preferences as “given”, but rather as something evolving, ideally in deliberative processes.

The combination of the ecosystem perspective and the sacred swamp approach contributed to the conscientization of diverse groups (cf. Ibrahim 2017). Information about ecosystem services and cultural tradition was one input to reflect on livelihood and nature conservation, while the visioning process put this knowledge into the context of individual and group action possibilities as well as the need for conciliation of interests. Specifically, the shared positive valuation of the hydrological service of the swamps created a common space to also have a plurality of views on other issues on swamp forest protection.

Non-material ecosystem services in relation to religion and spirituality have played an ambivalent role. Religion did not play an explicit role in the visioning process. This could be due to the absence of non-Hindu faith groups resulting in a cultural–religious background taken for granted. However, this is not the entire story: the proposal of a new sacred swamp in one workshop revealed inclusion–exclusion within the same faith group. Newcomers, even of the same faith group, are typically not included in the sacred swamps rituals. A possible explanation might be the close link between spiritual value, access and use rights, with newcomers threatening to undermine the resource base of those already there. A further explanation might be the nature of valuing. Prior research had suggested that the ecosystem service perspective offers valuation possibilities that are accessible across stakeholder groups (Hegde et al. 2020), as in evidence in the shared appreciation of hydrological provisioning services. The concept of nature’s contributions, however, puts the focus on the holistic concept of sacred

swamps that can be analysed in terms of ecosystem services but that is more complex than specific services, functions and individual beliefs. The process of joint valuing, as required for visioning, might *create* shared value rather than only discover sums and overlaps of individual value. “Shared values do not necessarily exist a priori; they can be deliberated through formal and informal processes through which individuals can separate their own preferences from a broader metanarrative about what values ought to be shared” (Irvine et al. 2016). From this perspective, the declaration of a new sacred swamp generates shared value. Rather than a “backward” tradition, the concept of sacred swamps as a forward-looking strategy may (also) be more inclusive, as migrants can participate in the production of shared value. If correct, this provides additional importance to visioning workshops and other participatory, forward-looking approaches for nature conservation. They can encourage participation of forest communities who have little experience with structured planning methods, including the most marginalized groups (Evans et al. 2010). However, our results for the participation of different stakeholder groups—such as women and non-believer migrants—show that this only becomes an inclusive participation if additional measures are taken to make the workshops accessible to groups facing cultural and economic barriers.

Values, local knowledge and ecosystem restoration

The UN Decade on Ecosystem Restoration aims to massively scale up the restoration of degraded ecosystems to fight the climate crisis and enhance food security, water supply and biodiversity. Currently, about 20% of the planet’s vegetated surface shows declining trends in productivity with fertility losses linked to erosion, depletion and pollution in all parts of the world. Ecosystem restoration is fundamental to achieving several sustainable development goals and is also a pillar of international environmental conventions. Since local stakeholders contribute contextual knowledge about the landscapes and species present, there is a need to involve them in the ecosystem restoration (Fig. 2). The visioning workshops are one way to foster such involvement.

However, we also encountered limitations that call for further development of the method. While we noted the possibilities created by shared valuations in the generalizing perspective as well as the inclusive potential of a forward-looking discussion of sacred swamps as future vision (and not just past heritage), an expanded version of the visioning workshops would include prior, group-specific stakeholder discussions. In light of the results above, these would specifically aim to better include women and smaller groups adapted to the barrier of distance that this stakeholder group highlighted. They would also aim to include migrants from other faith groups, which subsequently would more likely

join a visioning exercise with all stakeholders. In addition, further method integration is needed downstream of the workshops to follow up on the collaboration needs identified during the workshops. Collaborative follow-up with actors from government and larger civil society or private sector organizations would promote the scaling up demanded by the UN Decade on Ecosystem Restoration.

Conclusion

The new Global Biodiversity Framework calls for participatory biodiversity management that respects and includes indigenous peoples and local communities (CBD 2022). Our study supports this collaborative move with a participatory visioning method. It combines informing communities of hydrological, ecological and socio-economic attributes and benefits of swamps with the creation of a space for participatory discussion of joint goals and actions for nature conservation and livelihood protection. The visioning workshops link results on physical, ecological and socio-cultural aspects of swamps to the development of location-specific, desirable suggestions that also draw on local knowledge and practices. The visioning approach thereby promotes the development of action plans in response to the challenges that forests and tropical freshwater swamps are facing. It shows how local communities can come up with comprehensive responses to biodiversity loss and threats to livelihoods. The discussion of agency options and responsibilities yields concrete suggestions that can inform the work of institutional actors, such as the State Forest Department.

Even though biodiversity value had been rated low in prior research, the presentation of research findings on biodiversity to workshop participants generated a feeling of pride and underscored the importance of viewing conservation research as a process. The ecosystem perspective offered communication and discussion possibilities leading to possible collaborations for local bottom-up nature conservation. However, there were also limits to inclusive participation in visioning and decision-making, due to the difficulty of having migrants and non-believers participate as well as gender barriers. In light of these opportunities and limitations, we recommend:

- more participatory forest and swamp governance approaches that provide space for shared value creation, with participatory visioning as one tool for this purpose;
- further work on participatory visioning with a view to advancing the inclusion of women as well as inter-faith nature conservation possibilities, along with sustainable livelihood promotion and protection;
- further exploration of participatory visioning as a tool not only for conversation and livelihood planning, but also

as a learning tool for stakeholders about traditions and practices in their context (in recognition of the response of youth groups to the visioning);

- more awareness of the roles of established governance structures, such as the VFCs in our case, to not only engage with deteriorated ecosystems, but to also proactively support social–cultural approaches to safeguard freshwater swamps, including training and competence building of administrators about cultural practices and sustainable use of resources.

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Declarations

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