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Exploring the Role of Non-Formal Education in Tourism Resource Management

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Abstract

This study investigates the pivotal role of non-formal education in enhancing ecotourism resource management, aiming to elevate contemporary practices in the field. Utilizing a comprehensive methodology involving focus group discussions and expert interviews held at Parambikulam and Periyar Tiger Reserves of Kerala, India, the research employs latent content analysis to extract critical elements. The identified components of non-formal education programmes—education, awareness and interpretations—underscore their multifaceted nature within (eco)tourism destinations. Beyond unveiling strategies, the study scrutinises gaps in community interventions and their alignment with global mandates like the post-Aichi Target and Sustainable Development Goals (SDGs). Urging immediate action from policymakers, administrators and stakeholders, the research advocates for incentive-based mechanisms aligning with post-Aichi Target and SDG objectives. The study emphasises community-based non-formal education programmes foster community involvement and encourages social and cultural interventions. Significantly, these programmes contribute to biodiversity conservation by disseminating locally generated, authentic information. This research underscores the transformative potential of incentivized, community-driven, non-formal education, emphasising its crucial role in advancing local communities and global sustainability goals.

Keywords: Non-formal education; post aiche target; tourism resource management

Introduction

Tourism is a cornerstone of India's economic landscape, contributing 6.8% to the gross domestic product (GDP) and employing over 8% of the workforce (World Travel and Tourism Council, 2020). As per projections, India is poised to ascend from the eighth global tourism rank in 2019 to the third by 2029, potentially doubling its GDP contribution (World Travel and Tourism Council, 2020). Recognizing its significance, the NITI Aayog (formerly the Planning Commission of India) (2018) identifies tourism as the second-largest employer, catering to low and semi-skilled workers. The country has sustained a remarkable Compound Annual Growth Rate of 7.8% over the last three decades (1991–21), outpacing the world's 3.6% growth during the same period (Ministry of Tourism, Government of India, 2022).

Ecotourism emerges prominently in the context of tourism, constituting one-fifth of the market (World Tourism Organization, 2019). This sustainable economic development model seeks to enhance the quality of life for host communities, provides a superior experience for visitors, and preserves the environment; critical for both. Importantly, ecotourism aligns with the broader Sustainable Development Goals (SDGs), particularly Goals 8, 12 and 14. India, boasting two

biodiversity hotspots, the Himalayas and the Western Ghats, is a megadiverse nation, housing 70% of the Himalayas, 7,000 km of coastline, and various ecosystems. With a vast Protected Area (PA) network covering 5.02% of the country's geographical area, India ranks sixth globally for UNESCO Natural Heritage sites (Ministry of Tourism, Government of India, 2022). At the national level, acknowledging the economic and ecological importance of the sector, the Government of India introduced the National Strategy for Ecotourism 2022 (MoEF & CC, 2021), reflecting a strategic commitment to capitalise on the nation's rich ecological resources.

Ecotourism's essence transcends mere physical exploration, emphasising an immersive understanding of local ecosystems and endemism (Chan & Saikim, 2022). However, the need for robust education and interpretation components at the grassroots level within ecotourism operations renders these experiences incomplete, denying tourists nuanced insights into local endemism and ecosystem intricacies (Huang et al., 2023). Recognizing the pivotal role of education and interpretation in instilling pro-environmental behaviour, this study addresses a critical gap. By focusing on the non-formal education component within ecotourism programmes in India, the research rigorously explores how such initiatives contribute to local-level resource management.

The study's significance surpasses a superficial exploration of ecotourism dynamics; it aligns with the broader aim of fostering positive visitor behaviour and ensuring destination sustainability. Through an investigation into the impact of non-formal education on both the demand and supply sides of ecotourism, the research aims to heighten awareness and engagement. This heightened awareness is anticipated to spur informed decision-making and responsible practices, establishing a harmonious balance between tourism activities and the preservation of natural resources. In an era where sustainable tourism is imperative, this study comprehensively examines the intricate relationship between non-formal education, and local resource management, providing valuable insights to advance sustainable tourism practices.

Review of literature

Ecotourism and sustainable resource management

Within the realm of tourism, ecotourism closely aligns with the principles and approach of sustainable tourism (Fennell & de Grosbois, 2023). The International Ecotourism Society (The International Ecotourism Society, 2019) defines ecotourism as responsible travel to natural areas, emphasising environmental conservation, the well-being of local communities, and active interpretation and education. This definition underscores the integral role of ecotourism in safeguarding local communities' well-being and highlights interpretation and education as pivotal for achieving sustainability objectives.

In understanding ecotourism's operational approaches, two predominant paradigms emerge: the comprehensive approach and the minimalist approach (Schianetz et al., 2005). The comprehensive approach aims for profound understanding and endeavours to modify visitor behaviour positively, fostering a strong behavioural intention towards destination and conservation (Garrod & Fennell, 2023). Conversely, the minimalist approach focuses on basic understanding, with limited ambitions for value or behaviour transformation, and often maintains a status quo orientation (Kline & Fischer, 2023). It has been argued that the comprehensive approach is preferable for developing ecotourism destinations, as it holds greater potential for achieving sustainability than the minimalist approach through behavioural modification (Garrod & Fennell, 2023).

Consistent information dissemination is crucial for sustainable tourism resource management, mainly through community-based ecotourism programmes (Lee et al., 2023). Environmental education and interpretation, ranking second only to economic development, are vital components among the 29 conservation actions of ecotourism (Wardle et al., 2018). Initiating numerous education programmes in informal or non-formal manners across destinations

accentuates the global recognition of their importance (Ooi & Shelley, 2023). In this context, the present study seeks to unravel the community's role in ecotourism's non-formal education programmes for sustainable resource management, aiming to identify strategies to enhance these practices through effective non-formal education delivery.

Non-formal education and strategies for resource management in ecotourism

The review encompasses diverse educational settings: formal (e.g., school and higher education), informal (e.g., faith-based programmes) and non-formal (e.g., community/voluntary sector involvement). In the realm of non-formal education, an emphasis on activity orientation is evident, where learning occurs as participants engage in activities or social interactions (Tauro et al., 2021). As Chan et al. (2018) noted, this approach organises and sustains educational activities, offering a distinct dimension that needs to be more precisely aligned with formal education definitions. Wardle et al. (2021) highlight the growing focus on indirect conservation approaches involving visitor education and community-based initiatives, particularly in tourism destinations.

Research by Almeida Carreira (2022) emphasises the positive impact of participation in non-formal conservation education programmes on tourists' environmental knowledge. Um and Yoon (2021) underscore that perceived value satisfaction and involvement can foster environmentally responsible behaviour among tourists, showcasing the potential for community-based conservation to instil pro-conservation attitudes. Recognizing the essential role of local community ties in destination area conservation, Ardoin et al. (2020) and Hansen and Sandberg (2020) explore community attitudes toward conservation education efforts, revealing variations influenced by factors such as perceived benefits, exposure to education, resource conflicts and socio-economic considerations.

Stakeholder orientations, particularly among the local community, significantly differ concerning environmental engagement and intentions for conservation and sustainable tourism. This discrepancy underscores various motivating factors, including economic benefits, awareness, information, governance structures and resource use rights (Gong et al., 2021; Marpa, 2020; Morgan, 2018). While fostering pro-environmental resource management among community members, the study identifies three perceived constraints: intrapersonal, interpersonal and structural (Moghimehfar & Halpenny, 2016). The study further posits that informal environmental education activities play a crucial role in enhancing customer loyalty among tourism stakeholders (Machado Toffolo et al., 2022), addressing contemporary environmental concerns through the dissemination of information and encouraging small-scale daily actions. These observations underscore the need to strengthen non-formal education at ecotourism destinations, an area with limited direct literature exploration.

Theoretical framework

Norm Activation Model (NAM): Understanding individuals' behavioural intentions, the NAM is highly relevant in ecotourism and resource management. NAM states that altruistic and moral beliefs towards environmental actions drive individuals (Han, 2021). The present study posits the transformative potential of incentivized, community-driven, non-formal education in ecotourism destinations; NAM provides a theoretical framework for visitors' and local communities' behavioural intentions. The altruistic and moral beliefs promoted by NAM foster community involvement, social and cultural interventions and biodiversity conservation among visitors; when exposed to non-formal education programmes, the likelihood of developing a heightened sense of responsibility and engagement would be high. Thus, the theory supports the idea that awareness creation and environment interpretation become the catalyst for promoting responsible behaviour among visitors (Hadjichambis et al., 2020).

Value Belief Norm (VBN) theory: Individual-level realisation of environmental contribution, based on personal values, influences behaviour is better explained through the VBN theory

(Wensing et al., 2019). In the study's context, VBN becomes instrumental as the non-formal education programmes aim to disseminate locally generated, authentic information among visitors. The theory suggests that individuals who perceive personal value in contributing to the environment are more likely to modify their behaviour positively (Hadjichambis et al., 2020). As the study emphasizes the multifaceted nature of non-formal education, including components like education, awareness and interpretations, VBN becomes relevant in elucidating how individuals form values around these elements. Promoting positive behavioural intentions and insight into the value formation process is crucial. Non-formal education programmes can effectively engage individuals in minimising the adverse effects of their actions on the environment when they connect personal values with contributions to the ecosystem. Therefore, the VBN theory provides a theoretical foundation for understanding the role of non-formal education in shaping individual values and promoting environmentally responsible behaviour in the context of ecotourism and resource management.

In aligning theoretical insights with practical implications, the present study bridges the gap between pro-environmental behaviour models, specifically the NAM and the VBN, and empirical investigations. By conducting a gap analysis in existing non-formal education practices in ecotourism at Periyar and Parambikulam Tiger Reserves, the study aims to identify components, pinpoint gaps in delivery and assess their compatibility with global development targets such as the post-Aichi Target and SDGs. Accordingly, the specific objectives are:

- To identify the various components of community-based non-formal education practices in Periyar and Parambikulam Tiger reserves of India
- To identify the gap in the contemporary delivery of non-formal education programmes in the Periyar and Parambikulam Tiger reserves of India
- To understand the role of non-formal education towards post-Aichi Target and SDG
- To explore strategies for strengthening non-formal education delivery in ecotourism resource management.

Materials and methods

The study employed a focus group discussion (FGD) and expert interviews to delineate various components and implications of non-formal education in ecotourism. FGDs enable an examination of various viewpoints and encounters among individuals involved, thereby cultivating a thorough comprehension of the different aspects of non-formal education within ecotourism. Accompanying the FGDs, expert interviews contribute valuable insights and specialised expertise, enhancing the analysis and identifying practical applications for managing ecotourism and engaging with the community. Before commencing the main study, a pilot study was initiated to probe into the conservation efforts and ecotourism operations at Parambikulam Tiger Reserve and Periyar Tiger Reserve (PTR) in Kerala, India. The responses from the pilot study informed the refinement of variables, guiding the subsequent FGD, which took place at Parambikulam and PTRs in Kerala, India (Table 1).

Focus group discussion

The FGD involved Tourism Ecodevelopment Committee (TEDC) office bearers in their current positions and those who had served in preceding years. Criteria for selecting respondents were based on their experience and designation, with participants having 4–7 years of TEDC membership and holding the positions of president or vice president. TEDC office bearers, recognised for their involvement in direct actions (e.g., awareness through commentary, interpretation centres) or itinerary-related activities (e.g., nature trails, butterfly gardens), were

Table 1. Profile of the study area

Study Area	The area in Sq. Km	Year of Declaration as Wildlife sanctuary	Community profile (85% are Scheduled Tribes)	Community intervention framework	Community Members in Ecotourism	Active Members#
Parambikulam (Tiger Reserve)	265	1973	Kadar, Malasar, Muduvar and Malamalasar,	EDC*	503	302
Periyar (Tiger Reserve)	777	1934	Mannan, Paliya, Urali, Mala-araya, Malampandaram.	EDC	540	312

Source: Primary data/Author Compiled.*Ecodevelopment Committee.

considered reliable sources of information. Additionally, as most TEDC members act as naturalist guides in PA-based ecotourism destinations in Kerala, they were deemed reliable sources for insights into community participation in non-formal environmental education practices.

It is crucial to note that TEDC comprises local community members, with residents inside the PA eligible to become ecodevelopment committee members, aligning with the dual objective of ecodevelopment: conservation and livelihood. In Kerala, residents involved in open tourism activities form TEDC and legally represent the committee. Table 1 illustrates that most residents, mainly from tribal community hamlets spatially distributed within the PA, are TEDC members representing their respective PAs.

Considering the optimal number of respondents for FGD, six participants per group were deemed adequate for information gathering (Krueger & Casey, 2009). Due to the limited number of office bearers (current and former), FGDs had to be conducted even with fewer participants than the stipulated limit, particularly at Periyar, where the indigenous hamlet had a smaller number of TEDC representatives. FGD sessions varied from 60 to 90 minutes across different tribal hamlets. In total, 17 respondents participated in the FGD, contributing valuable insights from the two PAs under study.

Expert interview

The focus group transcripts underwent meticulous review to pinpoint unexplored facets within the investigated concepts. To address identified gaps, an expert review ensued, engaging individuals from both academia and conservation authorities. Seven officials from ecotourism destinations (four from Periyar and three from Parambikulam) and four academic experts specialising in ecotourism contributed their expertise to elucidate non-formal education in ecotourism, providing further insights into the discussed topics. The selection of PA authorities was guided by their roles in organising ecotourism activities with local community support, such as the Assistant Wildlife Warden overseeing the ecodevelopment programme in Periyar.

Latent content analysis

In pursuit of comprehending the study's overarching intent, latent content analysis (LCA) was applied to delve into words and themes emerging from the FGD and subsequent expert interviews. Recognised as an accessible and dynamic qualitative analytical approach (Bengtsson, 2016), LCA systematically explores interpretations as integral elements of data analysis (Alhojailan, 2012). Within the present study, LCA served to unveil gaps in the contemporary intervention of non-formal education.

Results and discussion

To enhance the contextual comprehension of the discussion, it is crucial to outline the operational characteristics of the two tiger reserves under investigation. By utilising secondary sources, a cross-analysis unfolds as follows:

Parambikulam Tiger Reserve (PKTR), the second tiger reserve in Kerala, situated in the southernmost state of India, known as "God's Own Country" in tourism literature, is located in the Palakkad district at Latitude 10'20 N and Longitude 76'35 E. In contrast, the PTR, one of the country's oldest PAs dating back to 1899, spans an area of 777 sq km. Representing Biogeographic Zone 5-B Western Ghats, PTR straddles parts of Kerala's Idukki and Pathanamthitta districts. Designated as a Tiger Reserve in 1978, PTR is geographically located at 90' 40' N and 770 55' E.

For the collaborative management of ecotourism resources, EDC plays a vital role in overseeing the operationalisation of ecotourism programmes. The Forest Development Agency in Parambikulam has established nine EDCs, collectively comprising over 500 members. These committees operate under the jurisdiction of the Forest and Wildlife Department of the Government of Kerala.

Within these committees, 88 percent of the EDC members are from tribal communities, while the remaining members originate from communities displaced due to the Parambikulam Aliyar Irrigation Project. These nine EDCs are meticulously formed by rallying four distinct indigenous forest-dependent communities—namely, the Kadar, Malasar, Muduvar and Malamalasar—residing in six colonies within the tiger reserve. In the PTR, a similar approach is undertaken to ensure the collaborative management of ecotourism resources. Here, EDCs operationalise ecotourism programmes, comprising members from communities such as Mannan, Paliya, Urali, Mala-Arayaand a small nomadic group called Malampadaram.

At PTR, non-formal education programmes encompass jungle camping, exploring bamboo groves, visiting tribal hamlets and engaging with the Rajiv Gandhi Interpretation Centre. Conversely, at the PKTR, non-formal education programmes involve experiences such as vehicle safaris, trekking, bird watching, wildlife viewing, camping facilities (including tented niches, honeycomb stays, Tellikal nights, Vettikunnu Island visits, treetop huts, Sambar machan, Cheetal Valley exploration, Bison Valley encounters, etc.) and participation in paid nature camps.

In both Tiger reserves, EDCs exhibit diverse operational profiles, including:

1. Village EDCs designed for socio-economic upliftment in tribal settlements and hamlets
2. User Group EDCs tailored for activities like grazing, fuelwood collection, thatching, grass harvesting and guiding pilgrimages, particularly to Sabarimala
3. Professional Group EDCs focused on establishing long-term interactions within the PA.

The Professional Group EDCs comprise individuals with varied roles, such as ex-cinnamon bark collectors (exclusive to PTR), tribal trekker-cum-guides and watchers, with a significant number serving as guides or interpreters.

A designated EDC, known as a naturalist EDC and equipped with specialised training, is responsible for educational and interpretational activities at the destination. All ecotourism activities are collaboratively organised within the communities to guarantee fairness in resource utilisation. For example, a rotational system is implemented during the off-season to allocate various responsibilities among community members. Hence, it can be inferred that local communities have favourable attitude towards conservation education efforts and improvements in their awareness level.

The subsequent discussion is organised according to the defined objectives, addressing the following key aspects: (a) Components of non-formal education programmes, (b) Gaps in contemporary community involvement in delivering non-formal education, (c) non-formal education's role in achieving post-Aichi Targets and SDGs, (d) Anticipated benefits of non-formal education in biodiversity conservation, and (e) Strategies for enhancing non-formal education in ecotourism.

Components of non-formal education programmes

Components of non-formal education in ecotourism can be broadly classified into three. These are as follows:

Educational

Education stands as an indispensable aspect for sustainable development, instrumental in yielding more effective outcomes in the sustainable resource management. For enhancing overall tourist satisfaction, ecotourism serves as a structured source of information on the natural and cultural value as well as the aestheticism of available resources. Exploring various natural and cultural facets within ecotourism destinations becomes pivotal for ensuring tourist contentment. Initiatives in non-formal education by destination communities, such as nature camps and specialised sessions on endemic flora and fauna, offer ample opportunities to disseminate authentic information. This, in turn, fosters a deeper understanding of the environment among tourists and various stakeholders in the tourism sector. In the words of the TEDC president, "These programmes are meticulously crafted not only to provide experiential activities but also to enlighten tourists on how to engage with nature". He further explained that "the visitors often appreciate the educational content we provide as most of such information are very endemic".

Awareness

Fostering a culturally and environmentally conscious citizenry necessitates raising awareness among tourists regarding the consequences of unsustainable practices, encompassing all adverse aspects of consumption. Holistic awareness programmes, such as signboards, specialised sessions in natural settings, nature walks and behavioural guidelines, are implemented through community collaboration. As a TEDC member and naturalist from Parambikulam Tiger Reserve expressed, 'This integrated community-based awareness programme aims to instil pro-environmental behaviour not only among tourists but also within our community and other stakeholders. They serve as catalysts in promoting high-quality destinations and fostering better living environments.'

Interpretation

Interpretation is a component that gives nuances of a locality's natural and cultural properties. It provides insight into the imbibed values of the ecosystem and its applications to the listener for a cautious approach. Environmental Interpretation helps the commoner to understand the technical features of natural science or related fields. It makes understanding more enjoyable, and the awareness level becomes enhanced by involving entertainingly and interestingly. In ecotourism, the interpretation programmes help to transform a visit to a natural and cultural site into experience-based learning, providing educational opportunities in a natural setting while engaging themselves in the nuances of the endemic features of nature and cultures of the destination concerned. In other words, this interaction enhances the nature experience by providing on-site information through signage, exhibits and other indicators that can create a strong impact among visitors and go a long way towards increasing public commitment to the cause of conservation.

'We have a well-organised interpretation centre here, which helps the tourists understand the nuances of the forest ecosystem and its endemism, which is generally inaccessible to all. Local knowledge is made available with community support,' says a Range officer from PTR. This observation is similar to Ham and Weiler (2002) typology of interpretation, which calls for the inclusion of local communities and other stakeholders for the authenticity of content to elicit positive behaviour among visitors.

Nevertheless, these elements are slightly different between the two tiger reserves. Parambikulam Tiger Reserve (PKTR) offers more immersive educational and interpretive

programmes featuring guided treks and interactions with indigenous communities. The reserve's educational components primarily revolve around designated guided walking trails and boat rides. Conversely, PTR adopts a more collaborative, research-oriented approach. Additionally, while PTR concentrates on preserving the biodiversity of the Western Ghats, PKTR prioritises the conservation of tropical forests.

Gaps in contemporary intervention in non-formal education

Community groups' participation in education, awareness and interpretation seems notably absent, except for the naturalists affiliated with TEDC in the study area. Most destination visits are guided tours facilitated by travel agents or tour operators outside the area, primarily from towns and cities. Naturalist guides operate within the buffer zone, core areas of PAs and activity zones; external guides handle nearby regions where most interrelated objects and subjects of attraction are located. Tour operators justify bringing guides from outside the destination by citing factors such as professionalism, communication and cultural differences, which they claim hinder the engagement of local guides and interpreters.

'Often travel agents bring their guides, but inside the forest we only guide them, we can give better information than them' -Naturalist Guide commented.

Environmental education can offer informative insights, yet its effectiveness hinges on the reliability of the sources delivering it (Rosilawati & Ariyati, 2021). Frequently, information pertaining to destination specifications, such as ecosystem values and cultural properties, lacks authenticity and may mislead visitors. Guides or interpreters from external sources often rely on local communities to gain a more accurate understanding of the locality and its aesthetic values.

'External guides have been known to seek our assistance in acquiring information about various floral and faunal varieties outside the core area, as noted by another Naturalist guide'.

'The amount of information about this place they do not have, often misleading information is being shared,' another Naturalist guide observed.

Education constitutes a crucial element of overall tourist satisfaction, encompassing the systematic provision of information on natural and cultural values and the beauty of available resources. Local communities are regarded as the most suitable source for imparting such knowledge. Sustainability is inherently destination-specific, emphasising the need for the awareness component in pro-environment programmes to highlight local endemism and vividness and sensitise tourists about the impacts and implications of unsustainable environmental use. This approach aims to ensure a more culturally and environmentally aware citizenry.

'We have better command over others; we were born and brought up in this place, and we only know the pulse of the ecosystem'- argued another Naturalist guide.

'Though the animal is often the same across PAs like elephants, tiger, etc., their behaviour is according to the ecosystem they are in; the outsider cannot understand'- another Naturalist guide seconded.

Residents, often referred to as the 'sons of the soil,' possess the capacity to offer visitors more authentic information. Scientific interpretations infused with a local flavour enhance the aesthetic value of understanding a locality's natural and cultural properties. This observation underscores that all three communication components in ecotourism—education, awareness and interpretation—contribute to providing more genuine information to visitors through the support of the local community. Consequently, there is a demand for extending local community-based information delivery beyond the core areas of PAs.

Non-formal education in ecotourism for post-aicha target and SDG

The post-2020 global biodiversity framework extends the Strategic Plan for Biodiversity Mission 2030 objectives. It outlines a comprehensive strategy to implement widespread measures aiming

Table 2. Post-aichi target and non-formal education

Target No.	Post-aichi target -vision 2030 global biodiversity framework	Goal of non-formal education
Target 1	Increasing understanding, awareness and appreciation of the values of biodiversity, including the associated knowledge, values and approaches used by indigenous peoples and local communities	The role of achieving target 1 through non-formal education in Periyar and Parambikulam Tiger requires attention. Deliberations are to be made on the importance of biodiversity and its conservation among destination communities.
Target 2	Raising awareness of all actors of the existence of the goals and targets of the post-2020 global biodiversity framework	Non-formal educations help to bring all actors under destinations under study. Provision for non-formal nature education/ interpretation/ guiding by the communities as a fairly priced service leading to employment and income, can raise awareness further. This focus needs more focus at both destinations.
Target 14	Promoting or developing platforms and partnerships, including with media and civil society, to share information on successes, lessons learned, and experiences in acting for biodiversity.	Non-formal education helps in engaging destination communities, particularly women, the indigenous and local poor and vulnerable group for dissemination of education and nature interpretation, contributing to livelihood and well-being of these two destinations.

Source: Authors compilation.

for a transformative shift in society's interaction with biodiversity. The goal, by 2050, is to urgently engage society in conserving and sustainably utilising biodiversity, ensuring equitable benefit-sharing from genetic resources. The overarching vision is to propel biodiversity onto a recovery trajectory by 2030, benefiting the planet and its inhabitants (Convention on Biological Diversity, 2021).

In the subsequent section, we will explore how non-formal education initiatives at ecotourism destinations can contribute to achieving the post-Aichi Biodiversity target, aligning with the strategic plan for Biodiversity Vision 2050 and Mission 2030. Table 2 delineates the post-Aichi targets related to outreach, awareness and uptake, elucidating the role of non-formal education in ecotourism.

The intervention by destination communities in education, awareness and interpretation programme facilitates the easy achievement of post-Aichi Targets by contributing economically, socially, ecologically and politically. Proper mechanisms must be developed in line with these objectives to expedite further in PTR and PKTR. The ecological component of non-formal education touches; (a) SDG-12 to Ensure sustainable consumption and production patterns, (b) SDG-14 Conserves and sustainably uses the oceans, seas and marine resources for sustainable development, (c) SDG-15 Protects, restores and promotes sustainable use of terrestrial ecosystems, sustainably manage forests and the economic component fulfils the (d) SDG-1 End poverty in all its forms everywhere to a greater extent among destination communities worldwide. As Kristiana et al., 2021 cited, training and employment of local guides help to ensure economic benefit to the local community, this is especially important for developing countries. Moreover, local guides are familiar with protocols and local sensitiveness while experiencing natural and cultural sites and communities.

Strategies for strengthening non-formal education in ecotourism

The aim is to foster widespread public awareness as a vital component of conservation education, reinforcing attitudes, values and actions in harmony with the development of ecotourism.

Destination level enhancement

Initiating a framework for non-formal education aligned with local specifications in commencing eco/rural or other sustainable tourism programmes is a pivotal step in this direction. Guide local community-based organisations regarding the significance of awareness, education and interpretation through government departments such as Forest and Wildlife, potentially collaborating with local self-government in ecotourism destinations.

To enhance the effectiveness of this non-formal education:

1. Integrate creativity into guiding or interpreting specifications.
2. Launch special programmes to involve local people in the guiding framework beyond the core and buffer zone of PTR and PKTR, as well as other ecologically fragile areas.
3. When establishing non-formal education activities at destinations, seek input from experts, scientists, local community leaders and officials.

The pedagogy of educational awareness programmes should comprehensively cover ecosystem values beyond destination areas. Establish a two-way communication framework for non-formal education in all ecotourism programmes to enhance understanding, and provide relevant training to educators. Emphasise the principle of delegating authority, accountability and resources to the most appropriate level, with a preference for local responsibility and control over awareness-building activities.

Operationally the government departments such as Forest and Wildlife, Water Resource, etc., can tap into grassroots knowledge, especially from indigenous communities, for effective information dissemination. They should encourage the sharing of traditional and socially acquired knowledge rooted in local customs, integrating these initiatives with electronic media when suitable. Additionally, government and non-governmental organisations should engage the youth in such initiatives, preferably through programmes facilitated by state-affiliated Youth Welfare Departments.

Responsibilities at national/ state level for strengthening non-formal education Indian context

In reaffirming the rights of indigenous peoples, who constitute the primary inhabitants of the majority of PA-based ecotourism sites in India, the national or provincial government has the opportunity to enhance existing ecotourism programmes or establish an institutional mechanism to tap into their expertise for a more community-oriented ecotourism approach. Leveraging their indigenous knowledge can serve as the foundation for all ecotourism education and interpretation initiatives, promoting local endemism.

To formalise, standardise and infuse scientific rigour into this endeavour, the Forest and Wildlife Department, in collaboration with governmental or non-governmental agencies, can establish pre-service and in-service training programmes focused on education, awareness and interpretation. These programmes would be designed for all community members willing and capable of conducting such initiatives, aligning with the conservation and ecotourism development mandate.

Aligned with Post Aishe and SDGs advocating for the conservation and effective management of PAs, the government has the opportunity to introduce environmentally responsible leisure and tourism activities. Achieving this vision involves active participation from women, minorities, tribals and other marginalized segments of society, ensuring that non-formal education programmes at ecotourism destinations align with sustainability considerations.

The scientific knowledge essential for education, awareness and interpretation can be transferred through community members and hospitality training, as suggested by Sibthorp et al. (2020).

According to Kristiana et al. (2021), training can effectively address any shortcomings in communities interested in guiding or interpretations. The government's Forest and Wildlife Department should guarantee that education, awareness and interpretation programmes are conducted in collaboration with communities. Legislative and regulatory measures should be implemented if necessary, ensuring adherence to these programmes both in principle and practice.

National-level organisations in India, such as the Centre for Environment Education, can be assigned the responsibility of creating interpretation and education materials tailored to specific destinations in collaboration with Forest and Wildlife department officials or relevant authorities. The participatory framework can be structured through self-help groups (SHGs), ecodevelopment committees (EDCs), vana samrakshan samitis, non-governmental organisations (NGOs), community group members, native cultural groups, traditional leaders, local resource persons and tenants. This collaborative effort aims to organise comprehensive education, awareness and interpretation programmes. To enhance professionalism in the interpretation process, certification programmes with a focus on local communities can be developed. This aligns with the observation of Wardle et al. (2018), emphasising both direct and indirect approaches to conservation, including visitor education and community-based actions in ecotourism destinations.

Implications and conclusion

The practical implications of this study offer actionable insights for policymakers, conservation practitioners and community stakeholders involved in ecotourism resource management. Firstly, identifying critical elements within non-formal education that can trigger pro-environmental behaviour provides a practical guide for designing and implementing effective awareness programmes at PAs. These programmes can be tailored to support local livelihoods, promote conservation efforts and instil a sense of environmental responsibility among community members.

Secondly, the study's focus on pinpointing deficiencies in current non-formal education interventions serves as a roadmap for corrective measures. Policymakers and practitioners associated with these PAs can utilise the proposed strategies to strengthen the value and structure of non-formal education initiatives. By integrating community involvement, these initiatives can contribute to sustainable local development related to environmental sustainability, poverty eradication and broader conservation objectives.

This study significantly contributes to the theoretical understanding of pro-environmental behavioural theories, particularly the norm activation model (NAM) and the VBN theory of environmentalism. By highlighting the role of awareness as the foundation for learning and subsequent behaviour modification, the study reinforces the importance of cognitive and value-based factors in shaping individuals' attitudes toward environmental conservation. The findings provide empirical support for these theoretical frameworks, offering insights into how awareness initiatives can effectively stimulate pro-environmental behaviour among PA stakeholders. Researchers and scholars in environmental psychology and education can leverage these theoretical insights to refine further and advance our understanding of the psychological mechanisms driving sustainable behaviour. Together, these insights bridge the gap between theory and application, offering a holistic framework for promoting local sustainability.

More specifically, the empowerment of local communities can be attained by recognising their role in non-formal education initiatives, stakeholders can prioritise capacity-building efforts and participatory decision-making processes, and communities can be empowered to take ownership of conservation and sustainable development initiatives within their respective areas.

Promoting cultural and ecological diversity can be attained by tailoring educational strategies to local contexts. Stakeholders can leverage this insight to design educational programmes that

celebrate and preserve indigenous knowledge, cultural traditions and biodiversity, thereby enriching the visitor experience and fostering a deeper appreciation for the interconnectedness of cultural and ecological heritage.

Building on the study's recommendations for destination-specific strategies and collaborative approaches, stakeholders can prioritize long-term sustainability planning in ecotourism management. By integrating non-formal education initiatives into broader conservation and development frameworks, stakeholders can ensure the resilience and longevity of ecotourism practices, safeguarding natural resources and cultural heritage for future generations.

In conclusion, this study delves into community-based non-formal education practices in Periyar and Parambikulam Tiger Reserves, revealing their pivotal role in fostering pro-environmental behaviour. A cross-case analysis shows that both reserves align their non-formal education efforts with conservation priorities and local development aspirations. The findings pinpoint actionable strategies to bridge existing gaps and enhance the value of ecotourism resource management. By emphasising the theoretical underpinnings of awareness in shaping sustainable behaviour and offering practical insights for PA stakeholders, this study contributes to a comprehensive understanding of the intricate interplay between education, conservation and community engagement in ecotourism destinations.

References

Alhojailan, M. (2012). Thematic analysis: a critical review of its process and evaluation. *West East Journal of Social Sciences*, *1*(1), 39–47.

Almeida Carreira, V. (2022). *World heritage coimbra as a tourist destination: the relevance of cultural and educational synergies* (Unpublished Doctoral Thesis). University of Seville, Seville.

Ardoin, N.M., Bowers, A.W., & Gaillard, E. (2020). Environmental education outcomes for conservation: A systematic review. *Biological Conservation*, *241*, 108224.

Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open*, *2*, 8–14.

Chan, J.K.L., & Saikim, F.H. (2022). Exploring the ecotourism service experience framework using the dimensions of motivation, expectation and ecotourism experience. *Tourism and Hospitality Research*, *22*(4), 425–443.

Chan, Y.W., Mathews, N.E., & Li, F. (2018). Environmental education in nature reserve areas in southwestern China: What do we learn from Caohai? *Applied Environmental Education & Communication*, *17*(2), 174–185.

Convention on Biological Diversity. (2021). *First draft of the post-2020 global biodiversity framework*, UNEP, https://www.cbd.int/doc/c/abb5/591f/2e46096d3f0330b08ce87a45/wg2020-03-03-en.pdf.

Fennell, D.A., & de Grosbois, D. (2023). Communicating sustainability and ecotourism principles by ecolodges: A global analysis. *Tourism Recreation Research*, *48*(3), 333–351.

Garrod, B., & Fennell, D.A. (2023). Strategic approaches to accessible ecotourism: Small steps, the domino effect and not paving paradise. *Journal of Sustainable Tourism*, *31*(3), 760–777.

Gong, Y., Li, Y., Zhang, L., & Sun, Y. (2021). Informal learning in nature education promotes ecological conservation behaviors of nature reserve employees—A preliminary study in China. *Global Ecology and Conservation*, *31*, e01814.

Hadjichambis, A.C., Reis, P., Paraskeva-Hadjichambi, D., Činčera, J., Boeve-de Pauw, J., Gericke, N., & Knippels, M.C. (2020). *Conceptualizing environmental citizenship for 21st century education*. Springer Nature.

Ham, S.H., & Weiler, B. (2002). Interpretation as the centerpiece of sustainable wildlife tourism. In R. Harris, T. Griffin & P. Williams (Eds.), *Sustainable tourism: A global perspective* (pp. 35–44). Butterworth-Heinemann.

Han, H. (2021). Consumer behavior and environmental sustainability in tourism and hospitality: A review of theories, concepts, and latest research. *Journal of Sustainable Tourism*, *29*(7), 1021–1042.

Hansen, A.S., & Sandberg, M. (2020). Reshaping the outdoors through education: Exploring the potentials and challenges of ecological restoration education. *Journal of Outdoor and Environmental Education*, *23*(1), 57–71.

Huang, C.C., Li, S.P., Chan, Y.K., Hsieh, M.Y., & Lai, J.C.M. (2023). Empirical research on the sustainable development of ecotourism with environmental education concepts. *Sustainability*, *15*(13), 10307.

International Ecotourism Society. (2007). *Oslo Statement on Ecotourism*. TIES, from https://www.ecotourism.org/oslo-statement-on-ecotourism. Accessed October 18, 2020.

Kline, C., & Fischer, B. (2023). Morality on holiday: Inspiring ethical behaviour in animal-based tourism through non-moral values. *Tourism Recreation Research*, *48*(2), 147–158.

Kristiana, Y., Pramono, R., & Brian, R. (2021). Adaptation strategy of tourism industry stakeholders during the COVID-19 pandemic: A case study in Indonesia. *The Journal of Asian Finance, Economics and Business*, *8*(4), 213–223.

Krueger, R., & Casey, M. (2009). *Focus groups*. 4th edition, Sage.

Lee, T.H., Jan, F.H., & Chen, J.C. (2023). Influence analysis of interpretation services on ecotourism behavior for wildlife tourists. *Journal of Sustainable Tourism*, *31*(5), 1233–1251.

Machado Toffolo, M., Simoncini, G.A., Marchini, C., Meschini, M., Caroselli, E., Franzellitti, S., Prada, F., & Goffredo, S. (2022). Long-term effects of an informal education program on tourist environmental perception. *Frontiers in Marine Science*, *9*, 1–13.

Marpa, E.P. (2020). Navigating environmental education practices to promote environmental awareness and education. *International Journal on Studies in Education*, *2*(1), 45–57.

Ministry of Tourism, Government of India (2022). *National Strategy for Ecotourism*, Strategy Report, from https://tourism.gov.in/sites/default/files/2022-05/National%20Strategy%20for%20Eco%20Tourism.pdf. Accessed June 1, 2022.

Ministry of Tourism, Government of India (2012). *Research Report*, from http://tourism.gov.in/AnnualReport07-08.pdf. Accessed May 12, 2019.

Ministry of Tourism, Government of India. (2022). *India Tourism Statistics*, from https://static.pib.gov.in/WriteReadData/userfiles/IndiaTourismStatistics2022English.pdf. Accessed March 15, 2024.

MoEF & CC (2021) Guidelines on Sustainable Eco-Tourism in Forest and Wildlife Areas 2021, from https://mpforest.gov.in/ecotourism/pdf/MOEFCC.pdf. Accessed December 12, 2020.

Moghimehfar, F., & Halpenny, E.A. (2016). How do people negotiate through their constraints to engage in pro-environmental behavior? A study of front-country campers in Alberta. *Canada Tourism Management*, *57*, 362–372.

Morgan, A. (2018). Culturing the fruits of the forest: Realizing the multifunctional potential of space and place in the context of woodland and/or forest schools. *Journal of Outdoor and Environmental Education*, *21*(1), 117–130.

NITI Aayog. (2018). Strategy for New India @ 75, from https://www.niti.gov.in/sites/default/files/2019-01/Strategy_for_New_India_2.pdf. Accessed March 15, 2024.

Ooi, C.S., & Shelley, B. (2023). Shifting from benefiting to serving community: A case of regenerative tourism and building cultural capital through the children's university Tasmania. In *Handbook on tourism and rural community development* (pp. 359–372). Edward Elgar Publishing.

Rosilawati, Y., & Ariyati, S.K. (2021). Environmental communication on ecotourism development: a case study of Subak Sembung, Bali. *E3S Web of Conferences*, EDP Sciences (vol. 316, pp. 04011).

Schianetz, K., Kavanagh, L., & Lockington, D. (2007). Concepts and tools for comprehensive sustainability assessments for tourism destination: A comparative review. *Journal of Sustainable Tourism*, *15*(4), 369–389.

Sibthorp, J., Wilson, C., Povilaitis, V., & Browne, L. (2020). Active ingredients of learning at summer camp. *Journal of Outdoor and Environmental Education*, *23*(1), 21–37.

Tauro, A., Ojeda, J., Caviness, T., Moses, K.P., Moreno-Terrazas, R., Wright, T., Zhu, D., Poole, A. K., Massardo, F., & Rozzi, R. (2021). Field environmental philosophy: a biocultural ethic approach to education and ecotourism for sustainability. *Sustainability*, *13*(8), 4526.

The International Ecotourism Society. (2019). What is Ecotourism?, from https://ecotourism.org/what-is-ecotourism/. Accessed October 12, 2020.

Um, J., & Yoon, S. (2021). Evaluating the relationship between perceived value regarding tourism gentrification experience, attitude, and responsible tourism intention. *Journal of Tourism and Cultural Change*, *19*(3), 345–361.

Wardle, C., Buckley, R., Shakeela, A., & Castley, J.G. (2021). Ecotourism's contributions to conservation: Analysing patterns in published studies. *Journal of Ecotourism*, *20*(2), 99–129.

Wardle, C., Buckley, R., Shakeela, A., & Guy Castley, J. (2018). Ecotourism's contributions to conservation: Analyzing patterns in published studies. *Journal of Ecotourism*, *20*, 1–10.

Weaver, D.B. (2005). Comprehensive and minimalist dimensions of ecotourism. *Annals of Tourism Research*, *32*(2), 439–455.

Wensing, J., Carraresi, L., & Broring, S. (2019). Do pro-environmental values, beliefs and norms drive farmers' interest in novel practises fostering the bioeconomy? *Journal of Environment Management*, *232*, 858–867.

World Tourism Organization. (2019). *International Tourism Highlights*, 2019 Edition, UNWTO, Madrid. https://doi.org/10.18111/9789284421152

World Travel and Tourism Council. (2020). Economic Impact Analysis, from https://wttc.org/Research/Economic-Impact. Accessed December 2, 2020.

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