PRESERVING INDIGENOUS ECOLOGICAL WISDOM FOR SUSTAINABLE COMMUNITY-BASED TOURISM IN TAHURA KGPAA MANGKUNAGORO I

Setya Ambar PERTIWI[1*], Kesi YOVANA[2], Nadirah NADIRAH[3], Andre ARDI[4], Shinta DAMAYANTI[5], and Syubhan AKIB[6]
[1-5]International Relations Study Program, Universitas Prof. Dr. Moestopo (Beragama), Jakarta, Indonesia
[6]Faculty of Social and Management Sciences, STIAMI Institute, Jakarta, Indonesia
Email corresponding author: ambar.pertiwi@gmail.com

ABSTRACT

Protected forests are increasingly expected to conserve biodiversity while supporting local livelihoods through sustainable community-based tourism. However, conservation policies often emphasise formal management institutions while giving less attention to locally embedded systems of environmental stewardship. This study examines how Indigenous Ecological Wisdom functions as an informal conservation system supporting sustainable community-based tourism in Tahura KGPAA Mangkunagoro I, Indonesia. Indigenous Ecological Wisdom is conceptualised as the integration of ecological knowledge, customary norms, ethical values, spiritual beliefs, and intergenerational practices that guide community interactions with the forest. A qualitative case study approach was employed using semi-structured interviews, field observations, and document analysis. Data were analysed through thematic analysis. The results show that respect for culturally significant forest areas, protection of mature trees, shade-grown coffee cultivation, and the intergenerational transmission of environmental values continue to regulate resource use and support environmental stewardship. These community practices complement formal conservation management while preserving the cultural character that underpins sustainable community-based tourism. The study concludes that Indigenous Ecological Wisdom represents an important form of community-based environmental governance through which conservation and tourism can be mutually reinforcing.

Keywords: Indigenous Ecological Wisdom, Community-Based Environmental Governance, Sustainable Community-Based Tourism, Environmental Stewardship, Tahura KGPAA Mangkunagoro I

1. INTRODUCTION

Balancing environmental conservation with community development remains one of the central challenges of sustainable development. Increasingly, these objectives are understood not as competing priorities but as mutually reinforcing processes in which local communities play a central role. This perspective is reflected in the 2030 Agenda for Sustainable Development and the Kunming–Montreal Global Biodiversity Framework, both of which recognise that achieving environmental sustainability requires the active participation of indigenous peoples and local communities alongside formal conservation institutions (Convention on Biological Diversity, 2022; United Nations, 2015).

This shift has also influenced tourism development. Contemporary approaches to sustainable tourism place greater emphasis on environmental stewardship, cultural preservation, and community participation rather than visitor growth alone (UNWTO et al., 2018). Consequently, community-based tourism (CBT) has become an important development approach because it positions local communities not only as beneficiaries but also as custodians of the natural and cultural resources that sustain tourism (Dodds et al., 2018; Giampiccoli & Mtapuri, 2012; Giampiccoli & Saayman, 2018). Research has further shown that meaningful community participation contributes to the long-term sustainability and resilience of tourism destinations by strengthening local ownership and supporting more inclusive forms of destination management (Giampiccoli & Mtapuri, 2012). From this perspective, successful tourism depends on maintaining ecological integrity while preserving the cultural values that give destinations their distinctive identity.

At the same time, conservation research increasingly acknowledges that environmental governance extends beyond formal regulations. Alongside state institutions, many protected landscapes are sustained through locally embedded systems of ecological knowledge, customary norms, and collective responsibility that regulate everyday interactions between people and nature (Berkes, 2017; Ostrom, 2015). Recent studies likewise emphasise that conservation outcomes are often strengthened when formal governance arrangements are supported by local knowledge, social legitimacy, and community participation (Bennett et al., 2019). These informal institutions are particularly relevant in community-based tourism because they help maintain the environmental quality and cultural authenticity upon which sustainable destination development depends.

Tahura KGPAA Mangkunagoro I, located in Ngargoyoso District, Karanganyar Regency, Central Java, provides an appropriate setting for examining these relationships. As the only *Taman Hutan Raya* (Forest Park) in Central Java, the protected area covers approximately 2,634.1 hectares on the western slopes of Mount Lawu and serves multiple functions, including biodiversity conservation, environmental education, scientific research, cultural preservation, and nature-based tourism (Center for Data and Information, Ministry of Forestry, 2025). Tahura KGPAA Mangkunagoro I also constitutes a socio-ecological landscape where local livelihoods, cultural traditions, and conservation practices have evolved alongside the forest over generations.

Communities living around Tahura depend on the landscape for agroforestry, coffee cultivation, tourism-related activities, and other ecosystem services. These livelihood practices generally adapt to the existing forest ecosystem rather than replacing it. Coffee cultivation, for example, is commonly undertaken beneath existing tree canopies, allowing agricultural production to coexist with biodiversity conservation. Community members also maintain unwritten norms that discourage unnecessary tree cutting, respect culturally significant forest areas, and leave naturally fallen trees undisturbed. Although these practices are not formally codified, they continue to shape everyday interactions with the forest through collective memory and intergenerational learning.

To understand these community practices, this study adopts the concept of Indigenous Ecological Wisdom (IEW). While the concept builds upon Traditional Ecological Knowledge (TEK), which emphasises ecological knowledge developed through long-term interaction with the environment (Berkes, 2017), recent studies also recognise that indigenous and local wisdom contributes to biodiversity conservation by integrating ecological understanding with cultural values, customary institutions, and long-standing environmental practices (Abas et al., 2022; Reyes-García & Benyei, 2019). The Tahura case suggests that ecological knowledge alone does not fully explain local conservation practices. Community behaviour is also guided by customary obligations, ethical responsibilities, cultural values, and spiritual understandings regarding appropriate relationships between people and nature. Accordingly, this study defines Indigenous Ecological Wisdom as the integration of ecological knowledge, customary norms, cultural values, ethical responsibilities, and spiritual beliefs that collectively guide community interactions with the forest. Viewed from this perspective, Indigenous Ecological Wisdom functions as an informal conservation system that complements formal environmental governance by influencing everyday decisions related to resource use, environmental stewardship, and community participation.

Previous studies have shown that indigenous knowledge contributes to biodiversity conservation and that community participation supports sustainable tourism. Environmental governance scholarship likewise recognises that effective conservation depends on collaboration between governments, communities, and other stakeholders rather than state regulation alone (Armitage et al., 2012; Ostrom, 2015). More recent studies also emphasise that indigenous and local knowledge can play an important role in conservation planning and sustainability, yet these discussions have generally focused on ecological knowledge or governance as separate areas of inquiry (Abas et al., 2022; Reyes-García & Benyei, 2019). Comparatively little attention has been given to understanding how ecological knowledge, customary norms, ethical values, and spiritual beliefs operate together as an integrated informal conservation system that simultaneously supports biodiversity conservation, community livelihoods, and sustainable community-based tourism, particularly within Indonesian protected areas.

To address this gap, the present study examines how Indigenous Ecological Wisdom functions as an informal conservation system in Tahura KGPAA Mangkunagoro I. Specifically, it seeks to identify the principal forms of Indigenous Ecological Wisdom practised by surrounding communities, analyse how these practices shape community interactions with the forest and support environmental conservation, and examine their contribution to sustainable community-based tourism through the perspective of community-based environmental governance. The research contributes to the existing literature in three ways. Conceptually, it extends discussions of Traditional Ecological Knowledge by proposing Indigenous Ecological Wisdom as an analytical framework that brings together ecological knowledge, customary norms, ethical values, cultural traditions, and spiritual beliefs. Empirically, it provides evidence from an Indonesian protected area where community practices complement formal conservation management in everyday ways. Finally, it shows how recognising locally embedded governance systems can strengthen not only biodiversity conservation but also the cultural authenticity and community participation that underpin sustainable community-based tourism.

2. METHOD

This study employed a qualitative case study design to examine how Indigenous Ecological Wisdom functions as an informal conservation system supporting sustainable community-based tourism in Tahura KGPAA Mangkunagoro I, Karanganyar Regency, Central Java, Indonesia. A qualitative case study was considered appropriate because it enables

an in-depth examination of a contemporary phenomenon within its real-life context, particularly where ecological, cultural, and social dimensions are closely interconnected (Yin, 2018). Data were collected between February and June 2026 through multiple field visits using semi-structured interviews, field observations, and document analysis. Repeated visits enabled the researchers to observe community practices in different settings, verify information obtained during interviews, and develop a more comprehensive understanding of how Indigenous Ecological Wisdom is reflected in everyday interactions between local communities and the forest.

Participants were selected through purposive sampling based on their direct knowledge and experience of community–forest relationships. They included representatives of the Tahura management authority, community leaders, coffee farmers, local tourism actors, and residents from villages surrounding the conservation area. Semi-structured interviews were conducted using a flexible interview guide that explored local conservation practices, customary norms, environmental values, and perceptions of sustainable community-based tourism while allowing participants to elaborate on issues emerging from their own experiences (Creswell & Poth, 2018). Field observations documented community interactions with the forest, agroforestry practices, tourism activities, and conservation-related behaviour observed during the field visits. These observations complemented the interview data by providing contextual evidence of how Indigenous Ecological Wisdom was practised in everyday life. Official documents and relevant publications were also reviewed to complement the field data.

The data were analysed using thematic analysis following Braun & Clarke (2022). Interview transcripts, field notes, and documentary materials were coded inductively, and the resulting themes were interpreted in relation to the research objectives and relevant literature. To enhance the credibility of the findings, data triangulation was employed by comparing evidence obtained from interviews, field observations, and documentary sources (Nowell et al., 2017). Participation in the study was voluntary, participants were informed of the purpose of the research, confidentiality was maintained throughout the research process, and fieldwork was conducted with respect for local customs and cultural values.

3. RESULTS AND DISCUSSION

The results indicate that local communities surrounding Tahura KGPAA Mangkunagoro I maintain longstanding relationships with the forest through inherited values that guide everyday interactions with the natural environment. Rather than being expressed as formal regulations, these values are embedded in customary practices that influence how people access, use, and care for the forest. Across interviews and field observations, participants consistently described environmental stewardship as a responsibility passed down through generations, shaping both resource use and the community's relationship with the forest.

A prominent aspect of Indigenous Ecological Wisdom is the recognition of culturally significant forest areas. Participants explained that certain locations are regarded as sacred or spiritually important and should not be entered or disturbed without appropriate respect. These beliefs continue to shape how community members use and approach particular parts of the forest and remain widely observed by surrounding communities. During fieldwork, several participants referred to local stories describing visitors who ignored customary restrictions and subsequently experienced misfortune. Regardless of how they are interpreted, these narratives continue to reinforce community awareness that the forest should be approached with respect and caution.

This understanding was evident in the account of one community leader, who described the forest as something entrusted to the community rather than owned by it. From this perspective, respect for certain places is maintained not because of external supervision but because these values have been passed down through generations as part of living with the forest. Environmental responsibility is therefore understood primarily as a moral and cultural obligation rather than compliance with formal authority. Reinforced through everyday social interactions, community narratives, and intergenerational learning, these values allow customary practices to remain influential even in the absence of formal sanctions.

Another important aspect of Indigenous Ecological Wisdom is the close relationship between local livelihoods and forest conservation. Coffee cultivation is widely practised by communities surrounding Tahura; however, participants consistently noted that cultivation follows the existing forest structure rather than replacing it. Coffee plants are grown beneath mature tree canopies, while the surrounding vegetation is maintained to preserve shade and ecological balance. Community members also described an unwritten norm that discourages unnecessary tree cutting, reflecting the belief that agricultural production should coexist with, rather than transform, the forest ecosystem. Field observations confirmed that coffee cultivation was generally integrated into existing forest conditions, illustrating how livelihood activities and environmental stewardship are closely connected.

Community stewardship also extends beyond the protection of standing trees. Participants noted that naturally fallen trees are generally left undisturbed because they are regarded as part of the forest ecosystem and should not be removed without necessity. Although these practices are rooted in customary beliefs, community members also recognised their ecological value in maintaining soil conditions and supporting natural regeneration. This combination of inherited knowledge and practical environmental understanding demonstrates that community stewardship encompasses both cultural values and ecological awareness.

Table 1. Indigenous Ecological Wisdom Practices Identified in Tahura KGPAA Mangkunagoro I

Indigenous Ecological Wisdom Practice	Community Expression	Contribution to Conservation	Relevance for Community-Based Tourism
Respect for culturally significant forest areas	Limiting access to sacred locations and observing customary restrictions	Reduces disturbance in ecologically sensitive areas	Preserves cultural authenticity and enriches interpretive tourism experiences
Protection of mature trees	Avoiding unnecessary tree cutting	Maintains forest structure and biodiversity	Sustains landscape quality for nature-based tourism
Shade-grown coffee cultivation	Cultivating coffee beneath existing forest canopy	Supports agroforestry while conserving vegetation cover	Demonstrates environmentally compatible local livelihoods
Leaving naturally fallen trees undisturbed	Allowing natural ecological processes to continue	Contributes to soil health and forest regeneration	Reinforces visitors' understanding of ecosystem stewardship
Intergenerational transmission of environmental values	Passing customary knowledge through families and community leaders	Sustains long-term community participation in conservation	Preserves local identity as part of the tourism experience

Overall, the findings suggest that Indigenous Ecological Wisdom is not maintained through a single tradition or customary rule. Instead, it is reflected in the everyday ways community members interact with the forest—through the places they respect, the trees they protect, and the farming practices they continue to maintain. Together, these practices contribute to environmental conservation while preserving the cultural character that supports community-based tourism.

The findings suggest that Indigenous Ecological Wisdom operates as an informal conservation system, shaping environmental behaviour through shared community values rather than formal regulation alone. Although communities surrounding Tahura KGPAA Mangkunagoro I do not describe their practices in institutional terms, customary norms, ethical responsibilities, and spiritual beliefs consistently influence decisions about forest use and environmental stewardship. These locally embedded values shape everyday interactions with the forest and, in doing so, complement the objectives of formal conservation management.

This perspective extends discussions of Traditional Ecological Knowledge (TEK) beyond ecological knowledge alone. Berkes (2017) argues that knowledge accumulated through long-term interaction with ecosystems supports adaptive resource management. The Tahura case suggests that ecological knowledge is only one part of a broader system of community values and practices. Environmental stewardship is also sustained by cultural obligations, collective memory, and moral understandings of how people should relate to nature. From this perspective, Indigenous Ecological Wisdom offers an analytical framework that brings together ecological knowledge, customary norms, ethical values, and spiritual beliefs into a more integrated understanding of community environmental stewardship.

Evidence from Tahura also indicates that informal community practices reinforce, rather than compete with, formal conservation. Respect for culturally significant forest areas, the protection of mature trees, and the continued use of shade-grown coffee cultivation all help limit environmental disturbance while supporting local livelihoods. These practices are maintained primarily through shared social norms rather than external enforcement, suggesting that conservation initiatives become more effective when formal management is supported by locally embedded community values. Environmental stewardship therefore emerges from the interaction between formal conservation policies and locally embedded community practices rather than from regulatory authority alone.

These community practices also have important implications for sustainable community-based tourism. The long-term attractiveness of nature-based destinations depends not only on biodiversity but also on the continuity of the cultural practices that help sustain the landscape. In Tahura, Indigenous Ecological Wisdom contributes to both environmental conservation and the preservation of local cultural character. Community traditions encourage environmentally responsible behaviour while maintaining the cultural practices that shape visitors' experiences of the landscape. Sustainable tourism therefore extends beyond economic activity, reflecting an ongoing relationship between communities, culture, and the natural environment.

From an International Relations perspective, the Tahura case illustrates how global sustainability commitments are translated into practice through local environmental governance. International frameworks, including the 2030 Agenda for Sustainable Development and the Kunming–Montreal Global Biodiversity Framework, recognise the important contribution of indigenous peoples and local communities to biodiversity conservation (Convention on Biological Diversity, 2022; United Nations, 2015). The experience of Tahura shows that these international commitments are realised through locally embedded institutions that influence everyday environmental behaviour. Recognising Indigenous Ecological Wisdom therefore contributes not only to protected-area management but also to broader discussions of multi-level environmental governance, where global objectives, national conservation policies, and community practices operate in mutually reinforcing ways.

Overall, the analysis suggests that the long-term resilience of conservation initiatives depends not only on formal institutions but also on the locally shared values that sustain them. Viewing Indigenous Ecological Wisdom as an informal conservation system broadens current discussions of community-based environmental governance while highlighting its relevance for sustainable tourism and community development. Local traditions should therefore be understood not simply as cultural assets but as an integral part of environmental governance itself.

Future tourism development in Tahura KGPAA Mangkunagoro I should build upon the community practices that have long supported environmental stewardship rather than introducing approaches that are detached from local cultural contexts. Indigenous Ecological Wisdom already provides a practical foundation for balancing conservation, community livelihoods, and visitor experiences.

One opportunity lies in strengthening interpretive community-based tourism, where residents introduce visitors to the environmental values, customary practices, and cultural narratives that shape their relationship with the forest. Such initiatives would enable visitors to appreciate the landscape not only for its ecological qualities but also for the knowledge systems that have contributed to its preservation. Likewise, shade-grown coffee cultivation offers opportunities to demonstrate how sustainable livelihoods can coexist with biodiversity conservation, enriching tourism experiences while supporting local economic activities. Future initiatives may also benefit from collaborative programmes involving the Tahura management authority, surrounding communities, local government, universities, and tourism stakeholders. Rather than viewing Indigenous Ecological Wisdom simply as part of the visitor experience, these collaborations should recognise it as a living system of environmental stewardship that supports both conservation and sustainable community development.

4. CONCLUSION

This study demonstrates that Indigenous Ecological Wisdom functions as an informal conservation system that complements formal environmental management in Tahura KGPAA Mangkunagoro I. Through customary norms, ethical responsibilities, cultural values, and spiritual beliefs, surrounding communities continue to shape everyday environmental practices that contribute to biodiversity conservation while supporting sustainable community-based tourism. The study also extends discussions of Traditional Ecological Knowledge by showing that community stewardship encompasses more than ecological understanding alone. In the Tahura context, conservation is sustained through an integrated system of knowledge, values, and social practices that reinforces both environmental protection and community participation.

A key strength of this research lies in its qualitative case study approach, which provides contextual insights into the relationship between Indigenous Ecological Wisdom, conservation, and tourism within a protected landscape. At the same time, the findings are drawn from a single case and should therefore be interpreted within its specific socio-cultural and environmental context. Future research could examine whether similar forms of Indigenous Ecological Wisdom operate in other protected landscapes and explore how they interact with different conservation and tourism governance arrangements. Such comparative studies would contribute to a broader understanding of the role of locally embedded governance in supporting biodiversity conservation, sustainable tourism, and community development.

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