

# INTEGRATIVE SUSTAINABILITY SYSTEMS IN LOCAL CULTURAL SPACES AND ECOLOGICAL PRACTICES: A CASE STUDY OF GENAU INDONESIA IN PETUNGKRIYONO

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## Abstract

Tourism is widely promoted as a catalyst for regional economic growth, yet poorly managed development often generates ecological degradation and sociocultural disruption. This study aims to examine how an integrative sustainability system can be operationalized in rural tourism to balance economic benefits with environmental conservation and cultural resilience. Focusing on Petungkriyono, a protected highland forest area in Central Java, Indonesia, the research analyzes Genau Indonesia as a community-based tourism initiative implementing ecotourism principles. Using a qualitative case study approach, data were collected through in-depth interviews, document and media analysis to explore governance structures, program implementation, and community participation. The findings demonstrate that Genau Indonesia integrates low-impact tourism, environmental restoration activities, and cultural revitalization through collaborative governance involving local residents, youth groups, and environmental activists. Ecological outcomes include reforestation, river restoration, waste management, and biodiversity monitoring, while sociocultural impacts are reflected in the reinforcement of indigenous values, communal spaces, and traditional arts within tourism practices. Economically, the model supports local livelihoods without compromising ecological integrity. The study concludes that tourism can function as a platform for environmental regeneration and cultural continuity when guided by community-led governance. This case offers practical insights for replicating integrative sustainability models in other rural and forest-based tourism destinations.

**Keywords:** Tourism; Integrative sustainability system; Local cultural spaces; Ecological work

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## A. INTRODUCTION

Tourism is among Indonesia's most dynamic economic sectors, contributing 4.1% to national GDP in 2023 and projected to reach 5.5% by 2025. This growth is driven by the country's exceptional natural and cultural diversity, positioning Indonesia as a global destination for cultural and ecotourism. However, the rapid expansion of tourism has also intensified environmental degradation, resource extraction, and cultural commodification, particularly in ecologically sensitive and rural areas (Rusmana et al., 2025). These tensions reveal a fundamental contradiction: while tourism is promoted as a vehicle for development, its prevailing growth-oriented model often undermines the ecological and cultural foundations on which it depends. This condition underscores the urgent need for sustainability systems capable of balancing economic objectives with social equity and ecological integrity.

Globally, tourism is increasingly framed as a tool for sustainable community development aligned with the Sustainable Development Goals, particularly SDGs 8, 11, and 15. Yet in developing contexts such as Indonesia, tourism governance remains largely market-driven, privileging short-term economic gains over long-term ecological stewardship and social well-being (Cahyono & Haryanto, Kusumawardani, Purwono, 2025; Sholeha & Sumarmi, 2025).

Empirical evidence from destinations such as Sentul Rain Forest Tourism and coastal ecotourism sites in East Java demonstrates that economic benefits are frequently accompanied by environmental degradation and social disruption (Luthfiyah & Nugroho, 2025). These cases indicate that sustainability challenges in tourism are not merely managerial failures but structural problems rooted in fragmented governance and weak integration between ecological, cultural, and economic domains.

Indonesia's rural landscapes offer an alternative foundation for sustainability through indigenous ecological philosophies such as Tri Hita Karana in Bali, Memayu Hayuning Bawana in Java, and Siri' na Pacce in Sulawesi. These value systems conceptualize human-nature relations as reciprocal, ethical, and socially embedded (Barthel et al., 2021; Zhang et al., 2025). Such philosophies continue to inform community-based practices in forest management, water conservation, and agroforestry. Petungkriyono, a highland forest area in Central Java, exemplifies this interconnection between ecology and culture. As one of Java's last relatively intact forest ecosystems, it supports high biodiversity and traditional land-use systems, yet it faces increasing pressures from economic exploitation, youth outmigration, and uneven development. In this context, community-based initiatives such as Genau Indonesia have emerged as localized responses that integrate conservation, environmental education, and cultural revitalization through tourism.

This study is situated within the framework of eco-cultural resilience, which conceptualizes sustainability as the capacity to sustain both ecological systems and cultural meaning over time (Barthel, 2021). From this perspective, tourism is not merely an economic activity but a social process through which environmental ethics, local knowledge, and collective identity are reproduced. Activities such as trekking, homestays, and ecological volunteering thus function as modes of experiential learning that reconnect visitors and residents with local ecosystems. An integrative sustainability system, therefore, requires collaborative governance linking communities, youth groups, government institutions, academia, and the private sector (Yuliana et al., 2021). This approach moves beyond the conventional triple-bottom-line framework by placing cultural identity and moral responsibility at the core of tourism governance.

Within the Javanese context, the philosophy of Memayu Hayuning Bawana, which emphasizes preserving harmony between humans, nature, and the cosmos provides a normative foundation for ecological governance. Its principles resonate with sustainability science's emphasis on balance, reciprocity, and ethical responsibility toward nature (Rusmana, D. et al., 2025). When embedded in tourism management, this philosophy offers guidance for decision-making that transcends profit maximization and promotes participatory, culturally grounded approaches to land use and representation.

Although scholarship on sustainable tourism in Indonesia has expanded, existing studies remain largely fragmented. Research has examined policy instruments such as the CHSE framework (Yamin et al., 2021) environmental impacts of forest tourism (Luthfiyah & Nugroho, 2025) and visitor satisfaction in natural destinations (Yuliana et al., 2021). However, few studies systematically analyze how ecological work and cultural revitalization are integrated within a single sustainability system. Moreover, the role of youth-led organizations as drivers of sustainability transitions remains underexplored, despite their increasing influence in mobilizing environmental action and community engagement in rural areas.

Addressing this gap, the present study employs a qualitative case study approach to examine how Genau Indonesia operationalizes integrative sustainability principles in

Petungkriyono. Drawing on interviews, document analysis, and participatory observation, the study explores (1) how ecological and cultural dimensions are jointly embedded in tourism governance, and (2) the enabling and constraining factors shaping this process within the local institutional context. Guided by sustainability transition theory, the analysis conceptualizes Genau Indonesia as a niche innovation capable of challenging and reconfiguring dominant tourism paradigms in Indonesia.

Beyond documenting a single case, this research aims to conceptualize integrative sustainability systems as a replicable model for rural tourism development. By bridging debates in sustainable tourism, cultural geography, and environmental governance, the study contributes to the theoretical refinement of community-based sustainability models in Southeast Asia. The Petungkriyono case demonstrates that sustainability cannot be achieved solely through regulation or technology; it must be embedded within cultural values and everyday practices. In doing so, it reframes tourism as a participatory process of learning with nature and strengthening community resilience rather than a consumptive economic activity.

## **B. RESEARCH METHOD**

This study employed a qualitative case study approach to explore how the founder of Genau Indonesia conceptualizes and implements integrative sustainability in Petungkriyono, Central Java. The qualitative design was chosen to capture the depth of meanings and personal experiences behind the creation and operation of a community-based sustainability initiative. The case study approach allows the researcher to examine a single bounded system, Genau Indonesia within its real-life context, emphasizing process and understanding over generalization (Creswell and Poth, 2018)

Data collection focused on an informal, in-depth interview with the founder of Genau Indonesia as the primary source of empirical information. The conversation explored the organization's founding motivations, vision, program design, and practical efforts to integrate ecology, culture, and local participation. Conducted in an open, conversational setting, the interview provided nuanced insights into leadership values, youth engagement, and challenges faced in balancing environmental conservation with tourism and cultural authenticity. Follow-up clarification was conducted through online communication to ensure accuracy and completeness.

To enrich contextual understanding, the study also utilized sources from Genau Indonesia's official website, digital publications, and relevant media coverage. These online materials helped triangulate the founder's narrative and revealed how the organization publicly represents its sustainability efforts and community partnerships (Braun & Clarke, 2019).

Data were analyzed using thematic analysis, following Braun & Clarke (2019) six-phase process of coding and interpretation. Themes were developed around ecological practice, cultural continuity, and collaborative governance. Ethical clearance was obtained, and the founder provided informed consent. No monetary incentives were given, and confidentiality was maintained. This design of anchored in a single key interview supported by online contextual materials, offers a replicable framework for studying sustainability leadership in small-scale community tourism initiatives.

## **C. FINDINGS AND DISCUSSION**

1. The Founder's Vision and the Genesis of Integrative Sustainability

The origin of Genau Indonesia reflects the personal vision and ethical commitment of its founder, Amelia Nugrahaningrum, to protect Indonesia's tropical rainforests through inclusive and community-centered strategies. Her journey from ecological concern to social innovation demonstrates how sustainability can be cultivated as a lived practice rooted in local knowledge, ecological empathy, and participatory development. As Amelia Nugrahaningrum recalled, the establishment of Genau Indonesia began with a deep personal motivation to engage in forest conservation:

“The background of founding Genau was my desire to work in the field of tropical rainforest conservation in Indonesia. After going through several considerations, we finally chose the eco-tourism approach because we believe eco-tourism is a win-win solution for forest-edge communities. Local people can become guides, facilitators, food and homestay providers, so they gain additional income. This can serve as a trigger that forests also bring direct economic benefits to them.” (A. Nugrahaningrum, 2025).

This statement captures the conceptual bridge between ecological protection and livelihood creation, a core principle of community-based tourism (CBT) that aims to harmonize environmental stewardship with socio-economic empowerment (Bellato & Pollock, 2025). Over time, the organization expanded its focus beyond tourism to education and empowerment. As Amelia added,

“As time went by, we also focused on education and community empowerment.” (A. Nugrahaningrum, 2025).

This shift reflects what Nursamsiyah & Qodir (2024) call integrative sustainability, where social, environmental, and educational processes are interlinked as mutually reinforcing systems rather than separate goals. Although Petungkriyono had become a popular nature destination since 2015, tourism in the area was primarily extractive and visual, focused on taking pictures of waterfalls, rivers, and forest landscapes. Amelia observed that this form of tourism lacked meaningful engagement:

“If eco-tourism is defined simply as travel to nature, Petungkriyono has been known for that since 2015. Spots such as lakes, waterfalls, and rivers became the main attractions. However, eco-tourism based on activities that create deeper connection and interaction with nature and local communities did not yet exist.” (A. Nugrahaningrum, 2025).

This realization prompted Genau Indonesia to redefine eco-tourism as a transformative and experiential process, encouraging visitors to connect with nature and community values. Their programs aim to cultivate what Barthel et al. (2021) describe as eco-cultural resilience, a form of sustainability grounded in the co-evolution of cultural practices and ecological systems. Although Genau Indonesia did not start with a formal theoretical model, Amelia explained that the team used benchmarking and peer learning to shape their approach:

“We didn't follow a specific theory, but we did have benchmarks. At first, we wanted to learn from Kebun Kumara, but we also wanted to highlight the unique natural resources we have. So, the first thing we did was to create Kebun Genau. The difference from Kebun Kumara is that Kebun Genau was designed for education and the cultivation of wild edible plants native to Petungkriyono Forest.” (A. Nugrahaningrum, 2025).

Through this project, Kebun Genau became a living classroom and conservation site, reflecting the integration of biodiversity education and food culture.

“Our second benchmark was Astungkara Way in Bali. We learned about Astungkara Way through a Japanese student who interned at Genau. Inspired by their trekking-based model, we combined Kebun Genau with trekking and created the program Trekking Ramban Rimba, which is a foraging experience from forest to table.” (A. Nugrahaningrum, 2025).

This adaptation illustrates Genau's integrative sustainability model, blending environmental education, local culinary heritage, and experiential learning. As Folke et al. (2016) emphasize, sustainability is a process of adaptive co-evolution between social and ecological systems precisely the kind of evolution that Genau Indonesia embodies. Amelia emphasized that every activity at Genau Indonesia intentionally integrates ecological, cultural, and economic elements:

"In every eco-tourism program or package we design, we always integrate biodiversity and local wisdom. Each package in our operations intersects with social, cultural, economic, and environmental dimensions." (A. Nugrahaningrum, 2025).

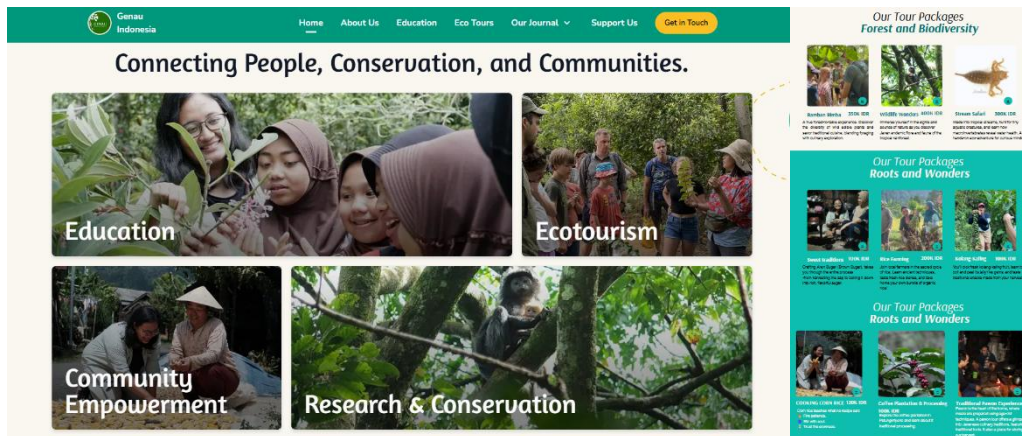
This philosophy reflects the biocultural approach to sustainability (Ladio, 2025), recognizing that ecological conservation and cultural continuity are inseparable. Genau's programs not only invite tourists to explore the forest but also to participate in local practices, learning about herbal knowledge, traditional foods, and the meanings embedded in the landscape. Through this participatory approach, Genau fosters community ownership of conservation, aligning with Ostrom (1990) argument that shared governance emerges when local actors perceive both ecological and economic benefits from sustainable practices. Although Genau has yet to obtain formal sustainability or eco-tourism certification, Amelia described how the organization maintains accountability through networking and collaboration:

"We haven't applied for any sustainability or eco-tourism certification yet, because we still don't have the funding for that. But we are active in networking with sustainability communities to maintain our values and good practices for nature. For example, we are part of Women Earth Alliance, Catalyst Changemaker from Goto, PFmuda Pertamina Foundation, and others." (A. Nugrahaningrum, 2025).

These collaborations have elevated Genau's credibility and expanded its ecosystem of support. In 2024, ANTARA News highlighted Genau's recognition through the PFmuda Sociopreneur Program, which supports young innovators in sustainable development (ANTARA News, 2024). Such alliances represent what Barthel, (2021) term "networked resilience," where sustainability is maintained through social connectivity and collective learning rather than formal certification mechanisms.

The integrative model of Genau Indonesia has generated multiple outcomes. Environmentally, its forest-foraging and education-based programs contribute to biodiversity awareness and reduced environmental impact. Socially, Genau empowers local women and youth to take active roles as guides, educators, and small entrepreneurs. Economically, the initiative provides alternative livelihoods that reduce dependence on extractive industries, aligning with the regenerative economy framework (Shao, 2025). Genau also serves as a platform for environmental education. As reported by Green Network Asia (2024), Genau regularly holds workshops with children and youth in Petungkriyono to instill forest stewardship and local pride. Amelia summarized this guiding philosophy succinctly:

"We believe conservation must be lived and experienced, not just taught." (A. Nugrahaningrum, 2025).



**Figure 1.** Programs on Genau Indonesia  
Source: genau.id, 2025

The story of Genau Indonesia demonstrates how a founder’s vision can evolve into a living system of integrative sustainability. From a personal commitment to rainforest conservation, Amelia Nugrahaningrum built an organization that unites ecological restoration, cultural identity, and economic participation. Genau’s development illustrates that sustainability in Indonesia is not only a technical challenge but a cultural practice, shaped by empathy, education, and adaptive collaboration. Through continuous learning and networked partnerships, Genau has transformed Petungkriyono into a site where ecological care, community creativity, and cultural resilience converge. It stands as a model of how local innovation, led by visionary leadership, can contribute meaningfully to the global pursuit of sustainability transitions.

## 2. Operational Practices: Linking Ecological Work, Cultural Revitalization, and Community Participation

The operational structure of Genau Indonesia represents a living experiment in integrative sustainability, one that connects ecological stewardship, cultural revitalization, and community-based participation through daily practices. Its model blends the logic of regenerative tourism with the ethos of conservation and cultural continuity. The operations are designed not merely as service delivery, but as a circulatory system that sustains livelihoods, reinforces local identity, and funds forest protection. Genau Indonesia sustains its programs primarily through eco-tourism income rather than continuous external funding. As founder Amelia Nugrahaningrum explained,

“We only receive one or two grants per year. These are usually separated: one for community empowerment and product development, and one for tourism operations. Our daily operational costs come mostly from the income of visiting consumers.” (A. Nugrahaningrum, 2025).

This hybrid financing model aligns with the principles of social entrepreneurship, where earned income supports mission-oriented activities while reducing dependence on donor cycles. The system is further structured to prioritize equitable benefit distribution:

“From every 100% of the tourist payment, around 60% goes directly to local residents for homestays, food, and guiding; 30% becomes Genau’s operational cost; and 10% is dedicated to conservation activities.” (A. Nugrahaningrum, 2025).

This transparent structure ensures that community members perceive tangible returns from forest preservation, a principle emphasized by Ostrom (1990) in her model of collective governance. Such financial redistribution transforms eco-tourism into a social mechanism for

conservation, where economic participation reinforces ecological responsibility. The team relies on participatory collaboration and local networks to sustain programs. As Amelia described,

“We are still small, but we try to build an ecosystem with the community. When people ask, ‘How can you sell this kind of experience?’ we prove it by bringing real guests.” (A. Nugrahaningrum, 2025).

This pragmatic approach illustrates Genau’s use of “learning by doing”, where experiential validation becomes a tool for building credibility and trust among residents and visitors alike. Rather than open recruitment, Genau’s collaboration with local residents is based on organic and trust-based relationships. As Amelia explained,

“We don’t do open recruitment for locals. We start with people close to us, then grow from one household to another step by step. The same goes for the facilitators.” (A. Nugrahaningrum, 2025).

This gradual model reflects the communitarian approach to capacity building (Lambertini, 2020) emphasizing relational trust, proximity, and mutual learning over formal structures. Through this process, Genau has cultivated a local ecosystem of guides, food providers, and artisans who share ownership of the eco-tourism mission. Genau’s programs are also designed to reflect local cultural rhythms and traditional values. The organization participates in community ceremonies such as Sedekah Bumi (earth thanksgiving), integrates traditional gamelan performances into events, and highlights daily forest-related practices such as palm sugar production (gula aren) and legen tapping. These elements not only preserve cultural identity but also situate conservation within the lived cosmology of local residents, an embodiment of biocultural revitalization (York, 2026). Despite its growing local influence, Genau’s collaboration with government agencies remains limited. Amelia observed:

“We have not yet established partnerships with the local government. The village and subdistrict leaders don’t fully understand our vision. There’s still a knowledge and vision gap.” (A. Nugrahaningrum, 2025).

This disconnect underscores a broader challenge in Indonesia’s decentralized environmental governance, where bottom-up innovation often lacks institutional recognition. Scholars such as Dale & Newman (2005) argue that sustainable transitions require not only community engagement but also vertical integration across governance scales. Genau’s experience highlights the tension between grassroots creativity and bureaucratic inertia, a common friction in local sustainability initiatives. Nevertheless, the absence of formal government partnership has allowed Genau to maintain operational autonomy and a strong ethical foundation rooted in forest conservation. As Amelia emphasized, the organization’s background “has always been about forest conservation,” positioning ecology as the central compass for decision-making. In an era of over-saturated eco-tourism offerings, Genau differentiates itself through its focus on biodiversity and authenticity. As Amelia stated,

“Running a specialized tourism project like this must begin with uniqueness. Trekking programs are everywhere, people fear missing out (FOMO). Our uniqueness lies in biodiversity. That’s our value.” (A. Nugrahaningrum, 2025).

By foregrounding forest biodiversity as experiential value, Genau transforms ecological complexity into a cultural asset. This approach mirrors the concept of regenerative tourism, which emphasizes the restoration of both ecosystems and human relationships with nature (Bellato & Pollock, 2025). Rather than commodifying the forest, Genau positions it as a co-educator, where guests and locals learn reciprocal care through guided interaction.

Through its operational design, Genau Indonesia exemplifies the practice of integrative sustainability systems, a synergy of ecological, cultural, and economic functions. Its financial

structure channels tourism income into community welfare and conservation. Its cultural integration preserves local heritage while framing it as an ethical dimension of environmental care. And its participatory model nurtures mutual accountability among local actors.

While facing challenges of climate, scale, and institutional support, Genau's practices reveal that sustainability does not depend on grand infrastructure but on everyday relationships and shared values. The organization's incremental, community-based evolution resonates with what (Syafi et al., 2025) describe as the adaptive resilience of socio-ecological systems, a capacity to persist, innovate, and transform in the face of uncertainty.

### 3. Challenges, Reflections, and Implications for Sustainable Governance

Situated at an altitude of around 1,000 meters above sea level, Petungkriyono presents both ecological richness and logistical challenges that shape the sustainability of its community-based initiatives. The steep terrain, remote access, and unpredictable weather patterns make environmental management and tourism operations highly sensitive to natural conditions. As Amelia Nugrahaningrum explained,

"The tourism operations can only run during the dry season, from May to September. Outside of that period, heavy rains make trekking and forest activities difficult" (A. Nugrahaningrum, 2025).

This dependency on seasonal cycles underscores the fragility of local eco-tourism economies, where sustainability is intertwined with climatic rhythms rather than continuous institutional or financial stability (Syafi et al., 2025). Beyond environmental constraints, Genau faces significant institutional and human resource limitations that affect its operational sustainability. The organization runs with a small, dedicated team, four stationed on-site, two handling digital communications, and one external member managing partnerships. This lean structure ensures flexibility and personal engagement but also exposes the vulnerability of small-scale, community-driven innovation to burnout and resource scarcity (Vasconcelos et al., 2026). With limited capacity for marketing and outreach, Genau depends largely on organic visibility through social media and visitor testimonials, making long-term sustainability contingent on fluctuating public interest rather than systemic support. Reflecting on these challenges, Amelia emphasized that Sustainable governance is a personal approach. The flow of funds cannot always be sustained. When there are no guests, we just go there ourselves. This statement captures a core characteristic of Genau's governance model, one that is relational, voluntary, and deeply rooted in shared purpose rather than formalized funding. Such a "personalized sustainability" approach reflects a broader trend in Indonesian community governance, where social ties and ethical commitment often substitute for institutional stability (Antlöv, 2025). While this model fosters local ownership and adaptability, it also reveals an inherent tension between passion-driven stewardship and economic precarity, a challenge that many small community organizations across Indonesia face.

These realities invite deeper reflection on the evolving meaning of sustainable governance. Petungkriyono's case demonstrates that ecological governance extends beyond financial continuity or administrative systems, it involves cultivating trust, participation, and cultural belonging. Genau's model exemplifies what Tsing (2015) calls "slow sustainability," a form of governance sustained through patience, community rhythm, and adaptive learning rather than growth-oriented metrics. Despite limited resources, the community's emotional investment and consistent participation form the social fabric that keeps ecological work alive.

The implications of this case are significant for broader sustainability policy. First, government and donor frameworks should acknowledge and support informal, relationship-based modes of governance that sustain ecological practices in rural contexts. This could include flexible micro-grants or adaptive funding schemes for community innovators who operate in seasonal or high-risk environments. Second, strengthening partnerships between local actors, academic institutions, and government agencies could enhance resilience by connecting indigenous practices to broader sustainability networks. Petungkriyono's experience with Genau Indonesia reveals that sustainability in peripheral ecotourism settings depends not merely on resources or institutions but on the endurance of collective commitment. Sustainable governance, in this sense, emerges from the everyday labor of maintaining relationships with nature, with one another, and with the place itself, where resilience is cultivated through care, creativity, and continuity amidst uncertainty.

#### **D. CONCLUSION**

This study demonstrates that an integrative sustainability system offers a viable pathway for aligning ecological preservation, cultural continuity, and economic viability in rural tourism development. The case of Genau Indonesia in Petungkriyono illustrates that sustainable tourism can flourish through community participation, youth-driven innovation, and cultural revitalization rather than through externally imposed regulation or capital-intensive interventions. By embedding ecological care within everyday practices such as forest foraging, biodiversity education, and cultural celebration Genau redefines tourism as a process of learning with nature rather than consuming it.

The findings indicate that sustainability is not merely a technical or managerial endeavor but a moral and cultural process sustained by trust, adaptability, and deep attachment to place. For local communities, particularly youth groups, this model strengthens collective agency, reinforces intergenerational knowledge transmission, and positions cultural spaces as foundations of conservation. For policymakers, the case underscores the need for flexible, place-based governance frameworks that recognize grassroots initiatives as strategic partners rather than peripheral actors. Tourism practitioners and development organizations can draw lessons from Genau's transparent benefit-sharing and participatory collaboration, which demonstrate how tourism enterprises can function as platforms for environmental regeneration and cultural continuity. For academic discourse, this study contributes to debates on eco-cultural resilience by emphasizing sustainability as a socially embedded practice shaped by values, relationships, and local ethics.

Despite challenges related to funding constraints, seasonality, and limited institutional support, the Genau experience affirms that community-led governance can sustain long-term resilience when ecological responsibility and cultural identity are treated as inseparable. Future research should extend comparative analyses across rural destinations in Indonesia to explore how integrative sustainability systems can be scaled without undermining their grassroots foundations. Strengthening collaboration among communities, government institutions, and academia will be essential to ensure that sustainability evolves beyond a development strategy into a shared cultural ethos across Indonesia's diverse landscapes.

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