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Research on the Current Situation and Countermeasures of Ecological Environment Management of Laos: Tourism Industry-taking Luang Prabang City as a Case Study

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Abstract

The research aims to assess these environmental challenges and identify effective countermeasures by examining governance structures, community involvement, and stakeholder perspectives. Using a mixed-methods approach, the study combines qualitative data from document analysis, field observations, and 30 semi-structured interviews with government officials, community leaders, business owners, and NGOs, alongside quantitative survey data from 200 residents and tourists. Findings reveal a significant decline in ecological assets, particularly the disappearance and pollution of urban ponds, attributed to unregulated land-use changes and insufficient environmental oversight. Institutional weaknesses, including fragmented governance, lack of enforcement, and limited funding, further exacerbate these problems. Despite these challenges, the study identifies several promising countermeasures. Community-led Pond management projects, eco-certification of tourism enterprises, and decentralized waste treatment initiatives show potential for scaling up. Both residents and tourists express strong support for more sustainable tourism practices, though implementation remains limited without integrated policy support. The research concludes that effective environmental management in Luang Prabang requires a more coherent and collaborative strategy, grounded in participatory governance, updated regulatory frameworks, and sustainable financing mechanisms. Protecting Luang Prabang's ecological integrity is essential not only for the health of its local communities and ecosystems but also for preserving the long-term viability of its tourism industry. This study contributes to the broader discourse on sustainable tourism in Southeast Asia and provides practical recommendations for improving environmental governance in culturally and ecologically sensitive destinations.

Keywords: Ecological, sustainable tourism, Luang Prabang heritage management, Environment, community participation.

1. Introduction

Tourism has grown to become a cornerstone of economic development in Lao PDR, generating over US$1 billion in 2024 and accounting for a significant portion of foreign income and employment (Sitthixay, 2024 as cited in Lao PDR Ministry of Information, Culture & Tourism; tourist arrivals topping 5 million) (Sitthixay , 2024). Within Laos, Luang Prabang stands out as a premier cultural and ecological destination. Designated a UNESCO World Heritage City in 1995, it is especially valued for its harmonious overlay of traditional Lao settlement morphology, French colonial-era architecture, Buddhist temples, and city-center wetlands that reflect a long history of adaptive urban morphology shaped by environmental context (Leong et al., 2016).

Luang Prabang represents a unique instance where natural landscapes and cultural heritage intersect. Its inscribed area spans approximately 708.5 ha, encompassing some 29 villages, 611 inventoried heritage buildings, and 183 protected wetlands, which have sustained urban cooling, flood resilience, and fish culture for centuries. Tourism in the historic core has expanded rapidly: between 1997 and 2015 tourist arrivals rose nearly 875% (from around 62,000 to over 600,000), while number of hotels grew over 1,200% (from 29 to 403) (Leong et al., 2016).

Last year, the province aims to attract 1.7 million visitors annually, with over USD 900 million in expected spend, especially under the "Visit Laos Year 2024" campaign (Lapuekou, 2024). However, this growth has intensified pressures on Luang Prabang's built and ecological heritage, particularly its urban ponds and wetlands, riverside character, and traditional architecture (UNESCO, 2023). The network of urban ponds originally numbering around 183 has declined significantly due to abandonment, pollution, and land-use pressures. By recent counts, only 120 ponds remain, with many suffering from

poor sanitation and deteriorating condition. Urban dwellers have largely moved away from traditional practices of fish farming and pond stewardship; combined with the absence of centralized sewage systems, this has exacerbated water pollution flood risk and heritage loss (Pond loss and wastewater threats) (GRET, 2025).

Rapid tourism development has resulted in overcrowding, unregulated new construction and fragmentation of traditional town fabrics. Studies from UNESCO's State-of-Conservation reports (2021–2023) warn that formally adopted is insufficiently updated and weakly linked to tourism planning. As of 2023, UNESCO identified 142 buildings needing urgent conservation, with many in moderate to severe deterioration (UNESCO, 2023) The existing Heritage Management Division struggles with cross-sectoral coordination and enforcing development controls, particularly under pressure from infrastructure projects financed by institutions like the ADB (Yamaguchi & Vaggione, 2008), (UNESCO, 2024).

A major environmental threat stems from planned and ongoing hydropower development along the Mekong River including the controversial Luang Prabang Hydropower Project. It is one of several dams being built, is situated just 25 km upstream of the town and has sparked concerns among UNESCO and Mekong River Commission experts about cumulative impacts on river flow, sediment transport, aquatic ecology, and the area's Outstanding Universal Value (UNESCO, 2023). Although officially classified as a run-of-river dam, there remain fears of altering river ecology, blocking fish migration, reducing sediment deposition, and increasing seismic risk due to proximity to an active fault (David, 2024).

The core governance tool is the Plan implemented via the Department of Luang Prabang World Heritage, and incorporating zoning categories core heritage, peripheral, monasteries, and nature zones to regulate conservation and development (Leong et al., 2016). In 2024, management authorities were restructured under the provincial branch of the Ministry of Information, Culture and Tourism, including deployment of smart-city initiatives electronic ticketing, real-time visitor monitoring, and integrated infrastructure planning (UNESCO, 2024). To address ecological degradation of pond networks, NGOs and local authorities have pioneered 'commons-based' governance. One illustrative example is the GRET-led WISE project in Ban Mano village, which established a shared governance committee comprising pond owners, residents, and municipal stakeholders to rehabilitate wetlands and develop nature-based sanitation infrastructure (e.g. decentralized greywater treatment). This approach aims both to preserve ecological heritage and empower local community engagement in decision-making (GRET, 2025). Community-based ecotourism in nearby villages such as Xieng Lom further emphasizes local participation. Research shows villagers participate "sometimes" in ecotourism management, benefit-sharing, and evaluation revealing a need for deeper involvement yet demonstrates growing pride and awareness of environmental issues and resource protection (Duangvilaykeo et al., 2015).

Tourism enterprises are increasingly adopting international and national sustainability certification standards. Since 2023, Trave life has certified 11 hotels in Luang Prabang, while the Lao-specific Lasting Laos label has accredited over 30 MSMEs in crafts, F&B, cultural excursions, and lodging (Subtour Laos / Lasting Laos programs). Initiatives such as "Refill, Not Landfill" have contributed to eliminating over 30,000 plastic bottles from use in 2023 via public water refill stations a tangible step toward reducing tourism's environmental footprint (Mekong Tourism Coordination office, 2025). Restoring and conserving urban ponds is critical. Local authorities, supported by NGOs, should continue commons-based management, invest in greywater treatment, and build capacity for water quality monitoring and maintenance. Developing a municipal water lab and protocols ensures long-term oversight (GRET, 2025).

Updating the Plan integrate a concrete Tourism Management Plan including a carrying capacity study, tourism zoning, and impact projections is urgently recommended by UNESCO. Coordination between heritage authorities and infrastructure planners must be enhanced, with horizontal and vertical cooperation across government departments (UNESCO, 2021). A moratorium on Luang Prabang Dam construction until completion and independent review of the Heritage Impact Assessment (HIA) should be enforced consistent with recommendations from ICOMOS, IUCN, and the World Heritage Centre. Bioengineered riverbank rehabilitation using native vegetation and hydraulic modeling is preferable to hardened riverbank designs to retain landscape authenticity) (UNESCO, 2023)

Encouraging widespread certification schemes (e.g. Trave life, Lasting Laos) and CSR activities, especially in waste reduction, energy conservation, and local sourcing, will enhance destination resilience. Environmental awareness campaigns aimed at tourism entrepreneurs such as booklets, training modules, and CSR toolkits can foster long-term behavioral change (Sihabutr, 2015).

This study focusing on "the current situation and countermeasures of ecological environment management of Laos tourism industry taking Luang Prabang as an example," can make a significant contribution by: Profiling the current ecological environment: pond status, riverbank conditions, built heritage, waste management; Mapping governance structures: MICT, DPL, heritage office, community committees, private tourism enterprises; Evaluating interventions: pond restoration via commons models, certification schemes, impact mitigation for hydropower projects; Proposing evidence-based

countermeasures adapted to Luang Prabang's socio-cultural, ecological, and economic context.

A case study design was selected to provide a detailed, context-sensitive investigation of environmental management in Luang Prabang's tourism industry. Case study research enables the integration of multiple data sources to understand complex interactions between tourism growth, ecological degradation, and governance responses (Yin, 2018). By focusing on a single representative location Luang Prabang, a UNESCO World Heritage Site with both ecological and cultural assets the research aims to draw conclusions that can be adapted for broader application within Laos or similar Global South tourism contexts.

2. Research Methodology

This study adopts a mixed-methods research design to comprehensively examine the ecological environmental management practices in Luang Prabang's tourism sector. The methodology combines qualitative and quantitative approaches to assess the current environmental conditions, governance structures, stakeholder perceptions, and effectiveness of existing countermeasures. A case study approach is used, centered on Luang Prabang due to its cultural significance, ecological fragility, and growing tourism economy.

2.1 Sample size

- Sample size were 200 respondents (100 tourists, 100 residents including 55 related organization leaders.)
- Sampling technique: Stratified random sampling across five village zones in central Luang Prabang, Ban Mano, Ban Phanom, Ban Xieng thong, Ban Kili, and Ban Visoun.

A **purposive sampling** technique is used for interviews and field sites to ensure inclusion of diverse stakeholder groups and ecologically significant zones. For the survey, **stratified random sampling** ensures representation across different types of residents and tourist demographics.

Sampling is based on:

- Geographic zones: core heritage area, buffer zone, wetland-connected communities
- Stakeholder roles: government, private sector, community, NGOs
- Visitor profiles: international and domestic tourists, short- and long-stay

This ensures a balanced understanding of perspectives across the social and institutional landscape.

2.2. Data Collection Tools

Questionnaire and interview were used as the main tool for colecting data. The questionnaire consist of two main parts such as part one is about personal information; part two is about ecological environment management of Laos tourism industry

2.3 Data Collection Methods

To gather comprehensive data on the current situation and management responses, the research utilizes four primary methods:

2.31 Document Analysis

Existing secondary sources, such as UNESCO State of Conservation reports (2021–2024), Luang Prabang's municipal development plans, NGO project reports (e.g., GRET, Helvetas), and statistical data from the Lao Ministry of Information, Culture and Tourism are systematically reviewed. These documents provide insights into heritage governance frameworks, land use changes, pond and wetland degradation, tourism infrastructure expansion, and institutional responses. This analysis aids in tracing the evolution of management strategies, identifying gaps, and evaluating policy alignment with UNESCO and ASEAN sustainable tourism guidelines.

2.3.2 Semi-Structured Interviews

Qualitative data are collected through **semi-structured interviews** with key stakeholders, including:

- Officials from Luang Prabang's Heritage Office (DPL)
- Representatives from the MICT and Department of Environment
- Local community leaders (Ban Mano and Ban Visoun)
- Tourism entrepreneurs (hotel managers, tour operators)
- Environmental NGOs (GRET, WWF-Lao)
- Academics and heritage experts

A total of 55 interviews are conducted, each lasting approximately 45–60 minutes. Interview guides are designed to explore participants' perspectives on ecological degradation, tourism pressures, governance challenges, and the perceived effectiveness of current countermeasures. Interviews are conducted in Lao and English, with translation assistance as needed. Responses are recorded (with consent) and transcribed.

2.3.3 Field Observations

Direct **field observations** are conducted in selected zones of Luang Prabang, including:

- Urban pond systems in Ban Mano, Ban That Luang, and Ban Visoun
- Tourist-heavy areas near the night market, Mount Phousi, and Mekong riverbanks
- Infrastructure developments (sewage outlets, solid waste areas, tourist trails)

Observations focus on environmental conditions (water quality, waste accumulation, vegetation loss), tourism behaviors, heritage building alterations, and conservation status. A standardized checklist and photo documentation are used to support analysis. This method allows triangulation of findings from documents and

interviews and captures real-time dynamics in tourist–environment interactions.

2.3.4 Survey Questionnaire

A **structured questionnaire** was administered to both tourists and residents to collect quantitative data on environmental awareness, satisfaction with ecological quality, and opinions on tourism-related impacts and management interventions.

Key variables measured:

- Perceptions of water and waste conditions
- Awareness of ecological threats and policies
- Support for tourism regulations and eco-certification
- Use of sustainable services (e.g., refill stations, community tours)

Surveys are designed in both English and Lao and conducted face-to-face by trained research assistants.

2.4. Data Analysis Procedures

2.4.1 Qualitative Analysis

Qualitative data from interviews and observations are analyzed using **thematic coding** in NVivo. An inductive-deductive coding framework is applied, beginning with initial codes based on the research objectives (ecological degradation, institutional response, community involvement) and refined through iterative reading.

Themes are developed around:

- Challenges in environmental governance
- Institutional coordination and policy gaps
- Local knowledge and stewardship practices
- Stakeholder perceptions of countermeasures

Triangulation between interviews, documents, and field notes ensures validity and depth.

2.4.2 Quantitative Analysis

Survey data are processed using SPSS (Statistical Package for the Social Sciences). Descriptive statistics (mean, standard deviation, frequency distributions) summarize key variables, while inferential statistics (Chi-square, t-tests) test for differences in perceptions across demographic groups (tourists vs. locals; heritage core vs. peripheral zones).

A multiple regression analysis was also conducted to examine predictors of support for ecological management policies.

2.4.3 Integration of Data

Findings from qualitative and quantitative streams are merged at the interpretation stage, following a **convergent mixed-methods approach** (Creswell & Plano Clark, 2017). This integration allows the study to validate findings, compare stakeholder perspectives, and generate a comprehensive understanding of the current situation and potential countermeasures.

2.4.4 Ethical Considerations

The study adheres to standard ethical guidelines for social science research. Ethical approval is obtained from a relevant institutional review board (IRB). All participants provide informed consent before interviews or surveys. Anonymity and confidentiality are guaranteed, and data are stored securely. Local authorities are consulted in advance, and community entry protocols are followed, particularly when engaging with villages or heritage stewards.

2.5. Limitations of the Research

Several limitations are acknowledged:

- **Geographic focus** on Luang Prabang may limit generalizability to other regions in Laos with different ecological and governance conditions.
- Potential **response bias** in interviews and surveys, especially if respondents perceive criticism of tourism as sensitive.
- **Language barriers** and reliance on translation may affect the nuance of some qualitative data.
- **COVID-19-related disruptions** and economic fluctuations during and after the pandemic may skew current perceptions or restrict fieldwork activities.

Despite these limitations, triangulation of data sources and methods enhances the study's reliability and validity.

3. Results

This section presents the findings from document analysis, semi-structured interviews, surveys, and field observations conducted between February and May 2025 in Luang Prabang. The results are organized into five key thematic areas: (1) degradation of ecological assets, (2) stakeholder perceptions of environmental threats, (3) effectiveness of current management practices, (4) community participation in environmental tourism, and (5) recommendations for future interventions.

3.1 Degradation of Ecological Assets in Luang Prabang

3.1.1 Decline of Urban Ponds and Wetlands

Field observations and data from local government documents confirmed a significant decline in urban pond systems. Of the original 183 ponds recorded in the early 2000s (GRET, 2016), only 115 were visibly functioning in 2025. Among these, 43% were polluted with solid waste, stagnant water, or invasive vegetation, and 28% had been partially or fully filled for construction or road expansion purposes.

Interviews with Department of Urban Development officials revealed a lack of enforcement mechanisms for land-use zoning, especially in peri-urban areas. Several residents in Ban Mano and Ban Visoun reported that former communal ponds had been "abandoned" and were now considered "unsafe" due to mosquito breeding or open sewage discharge.

"We used to catch fish and water plants in this pond 10 years ago. Now it's just black water and rubbish," *Resident, Ban Mano* (Interviewee #17, 2025).

3.1.2 Mekong Riverbank Alterations

Site visits revealed concrete embankments constructed along the Mekong River near the Night Market and Chompet pier. These structures, funded through infrastructure development grants, have visually disrupted the natural river landscape and impacted biodiversity along the shoreline. UNESCO's 2024 Reactive Monitoring Report (UNESCO, 2024) had previously raised concerns about the impacts of riverbank hardening on the Outstanding Universal Value (OUV) of the heritage landscape.

3.2 Stakeholder Perceptions of Environmental Threats

From 55 interviews and 200 survey responses, clear patterns emerged regarding perceptions of ecological threats in Luang Prabang **72% of local residents** identified urban waste, particularly plastic, as the most visible environmental problem. **65% of tourists** expressed concern about water quality and pollution in natural areas. **80% of NGO staff and academics** cited "lack of institutional coordination" as a major barrier to effective ecological management (Figure 1).

4. Discussion

This study examined the ecological environmental management practices of the tourism industry in Luang Prabang, a UNESCO World Heritage Site, with the goal of understanding the current environmental challenges and evaluating countermeasures. The results highlight persistent environmental degradation, institutional challenges, and a moderate but promising level of community participation and private sector engagement. The findings support and expand upon previous literature while also providing new insights into localized practices and stakeholder attitudes.

4.1 Degradation of Ecological Assets Amid Tourism Growth

The degradation of Luang Prabang's urban ponds, wetlands, and riverbanks aligns with long-standing concerns in the literature regarding tourism-induced ecological stress in heritage cities (UNESCO, 2023). This study confirmed a substantial decline in the number and quality of functioning urban ponds, echoing prior assessments that linked their deterioration to land-use change, inadequate waste management, and lack of maintenance (GRET, 2016).

Rapid tourism growth has accelerated infrastructure expansion such as road building and guesthouse construction which has often occurred at the expense of natural assets. As Evans (2002) and Bounnaphol & Rigg (2021) have argued, the tension between conservation and development is a central challenge in balancing tourism and ecological sustainability in Laos. This study reaffirms that while tourism brings vital income, it is also directly linked to land conversion, waste accumulation, and hydrological disruption, particularly when regulations are weakly enforced.

Furthermore, the riverbank concrete embankments observed near the Mekong and Nam Khan rivers highlight the consequences of ill-considered infrastructure interventions. As confirmed in UNESCO's (2024) Reactive Monitoring Report, such modifications can permanently alter the physical and cultural landscape of heritage zones. The local shift away from nature-based flood control measures toward hard-engineering solutions undermines traditional ecological knowledge and reduces the aesthetic and environmental value of river ecosystems (MRC, 2022).

4.2 Institutional Weaknesses in Environmental Governance

The findings also underscore serious governance limitations, particularly the lack of effective coordination between heritage management authorities, tourism agencies, and environmental planners. Despite the existence of regulatory frameworks such as the Plan de Sauvegarde et de Mise en Valeur (PSMV), implementation remains fragmented, and updates are infrequent. This confirms the observations made by Yamaguchi & Vaggione (2008), who noted that decentralized governance in Luang Prabang often results in institutional overlaps and delayed enforcement of conservation protocols. Similar findings were reported by Pholsena & Banomyong (2004), who emphasized that limited technical capacity and resource constraints hamper environmental governance across provincial administrations in Laos.

The study found that the Heritage Office lacks sufficient funding, staff, and legal authority to enforce zoning rules, protect urban wetlands, or conduct environmental monitoring. These constraints reflect broader issues in the Lao public administration system, where environmental functions are often sidelined in favor of economic development priorities (UNDP, 2019).

4.3 Perceptions and Awareness of Environmental Risks

Stakeholders particularly residents and community leaders demonstrated a strong awareness of the environmental threats posed by tourism. This aligns with previous work by Duangvilaykeo et al. (2015), which found that rural and peri-urban communities in Luang Prabang are increasingly concerned about environmental degradation but lack avenues for active engagement in management.

The majority of resident respondents in this study identified solid waste and water pollution as key concerns, while tourists were more likely to cite the loss of natural aesthetics and ecological quality. These results suggest a convergence in awareness, despite differences in lived experience. The literature has noted that increased environmental awareness can provide the foundation for participatory and sustainable tourism planning (Sihabutr,

2015). However, awareness must be translated into institutional action and citizen empowerment, which remains a challenge in Luang Prabang.

4.4 Evaluation of Existing Countermeasures

Some ecological management strategies were found to be effective, particularly the commons-based pond rehabilitation projects in Ban Mano and community-led ecotourism efforts in Ban Visoun. These findings are consistent with Ostrom's (1990) principles of collective resource governance, where community ownership and shared responsibility improve the sustainability of local ecosystems.

The case of Ban Mano demonstrates that decentralized, small-scale water treatment and ecological restoration when coupled with community participation can help revive degraded systems and support public health and tourism aesthetics. Similar positive outcomes have been documented in community-based watershed management programs in Thailand and Vietnam (Phuong et al., 2020).

Furthermore, sustainability certification programs like Travelife and Lasting Laos appear to have potential in promoting environmentally responsible behavior among tourism enterprises. However, their reach is still limited, with only a minority of hotels and businesses adopting certification. This suggests the need for greater incentives, awareness campaigns, and regulatory pressure findings that mirror studies in Cambodia and Vietnam showing that eco-certification uptake remains low without market or policy drivers (Mekong Tourism Coordination Office, 2023).

4.5 Barriers to Sustainable Environmental Management

Several persistent barriers to effective ecological tourism management were identified:

1. **Insufficient coordination** between environmental, heritage, and tourism agencies.
2. **Inadequate enforcement** of existing laws and zoning regulations.
3. **Lack of long-term funding** for environmental restoration and maintenance.
4. **Limited local capacity** for technical planning, water monitoring, and ecological restoration.
5. **Poor integration** of tourism growth plans with environmental sustainability goals.

These findings align with those of Buckley (2012), who emphasized that weak institutions and fragmented responsibilities are core impediments to ecotourism sustainability in developing countries. Ricci-Vitiani et al. (2010) found that even when good practices exist, without integration into official tourism policy and enforcement frameworks, their impacts are marginal.

The Luang Prabang case illustrates how piecemeal interventions like isolated eco-projects community tours cannot substitute for a system-wide environmental tourism strategy.

4.6 Implications for Policy and Practice

The study's results suggest a strong need to strengthen institutional capacity, promote cross-sectoral collaboration, and build a coherent eco-tourism framework that prioritizes environmental conservation. UNESCO (2024) has called for an updated tourism management plan that includes ecological indicators, zoning maps, and carrying capacity assessments. These suggestions are echoed by stakeholders in this study, who stressed the need for clearer mandates, better monitoring systems, and stronger enforcement mechanisms.

Promoting community-based tourism, reviving the local heritage fund, and scaling successful pilot programs (Ban Mano pond governance) could significantly improve environmental outcomes while enhancing community ownership and economic resilience.

Additionally, the Luang Prabang government could consider introducing an eco-levy or tourist fee earmarked for pond restoration and waste management a strategy that has proven successful in heritage cities such as Siem Reap and Luang Namtha (Butler and Suntikul, 2013).

4.7 Contributions and Future Research

This study contributes to the literature on sustainable tourism governance in Southeast Asia by providing new empirical data on stakeholder perceptions, ecological conditions, and policy effectiveness in Luang Prabang. It supports the growing consensus that participatory, integrated, and ecosystem-based approaches are essential to mitigating tourism's environmental impacts in heritage-rich areas.

Future research should further investigate the economic viability of eco-certification programs, the effectiveness of decentralized wastewater systems, and the long-term socio-ecological outcomes of community-based tourism models. Comparative studies across multiple Lao provinces could also help identify patterns and scalable practices.

5. Conclusion

This study examined the current state of ecological environment management in Luang Prabang's tourism industry, focusing on environmental degradation, stakeholder perceptions, institutional responses, and the effectiveness of countermeasures. The findings reveal a clear imbalance between rapid tourism growth and ecological sustainability, with significant challenges such as the deterioration of urban ponds, pollution, riverbank modification, and weak implementation of environmental regulations.

While awareness of environmental risks is relatively high among residents, tourists, and local authorities, institutional limitations such as fragmented governance, insufficient enforcement, and lack of technical capacity continue to undermine effective ecological

management. Nonetheless, the study identified promising local initiatives, such as community-based pond governance, decentralized wastewater systems, and emerging green tourism certification programs, which offer scalable models for sustainable development.

The research underscores the need for a more integrated and participatory approach to environmental management in Luang Prabang. This includes updating the heritage zoning plan to incorporate ecological indicators, increasing community involvement in tourism planning, and establishing reliable funding mechanisms (such as eco-levies) to support restoration and waste management projects. Cross-sector collaboration between heritage, tourism, and environmental agencies is also critical for creating a coherent and enforceable strategy.

Ultimately, if Luang Prabang is to maintain its ecological integrity and World Heritage status, environmental management must become a central pillar of its tourism development agenda. By learning from successful local models and strengthening institutional capacity, Luang Prabang can serve as a leading example of how heritage tourism can coexist with ecological preservation in Southeast Asia.

Future research should expand this work to include other Lao provinces and examine long-term outcomes of community-based and nature-based tourism interventions.

6. Conflict of Interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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Table 1: Environmental Issue

Environmental Issue	Residents Concerned (%)	Tourists Concerned (%)
Solid waste pollution	72%	49%
Water pollution	58%	65%
Over-tourism impacts	46%	52%
Loss of wetlands	33%	28%