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Resilient Ecotourism and Community Well-Being: A PLS-SEM Approach in Bukit Lawang

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ABSTRACT

Nature-based tourism in developing countries is increasingly vulnerable to environmental disruptions, socio-economic shocks, and institutional fragility. This study proposes and empirically validates a conceptual model of resilient ecotourism development aimed at enhancing community well-being in Bukit Lawang, Indonesia. The model integrates four key constructs: ecotourism development, tourism resilience, community-based governance, and community well-being. Using a quantitative approach, data were collected from 150 local stakeholders and analyzed with Partial Least Squares Structural Equation Modeling (PLS-SEM). The results confirm that ecotourism development significantly improves community well-being both directly and indirectly through tourism resilience, with substantial explanatory power (R^2=0.652). Community-based governance also contributes to resilience and equitable outcomes, although with a smaller direct effect. These findings highlight the strategic importance of integrating adaptive capacity and inclusive governance into sustainable tourism planning. The model offers practical insights for policymakers and tourism managers in fragile ecotourism destinations.

1. INTRODUCTION

Tourism has emerged as a key driver of global economic development, particularly in developing countries endowed with rich natural and cultural resources [1]. However, the rapid expansion of the tourism industry has also exposed its inherent vulnerability to external disruptions, including global crises, natural disasters, and pandemics [2]. The COVID-19 pandemic, in particular, highlighted the urgent need for a paradigm shift—from growth-centric models to frameworks that prioritize resilience and sustainability in tourism management.

Ecotourism, as a form of nature-based tourism with ecological and social responsibility at its core, offers significant potential to promote environmental conservation and empower local communities [3]. Unlike conventional tourism, ecotourism emphasizes minimal environmental impact, active community involvement, and educational value. Nevertheless, in regions prone to environmental hazards such as flash floods, forest degradation, and climate-related disruptions, traditional ecotourism frameworks fall short in addressing systemic risks [4]. To remain viable, ecotourism destinations must adopt a resilient tourism perspective—one that integrates risk mitigation, climate change adaptation, and community preparedness into spatial and policy planning.

Bukit Lawang, located in Langkat Regency, North Sumatra, Indonesia, serves as a prominent ecotourism destination and a critical conservation zone within the Gunung Leuser National Park [5]. Known for its unique biodiversity and the endangered Sumatran orangutan, the region attracts ecotourists from around the world. At the same time, Bukit Lawang faces recurrent ecological threats, notably flash floods in 2003 and 2015 that caused significant infrastructure and ecological damage [6]. These recurring shocks make Bukit Lawang a compelling case for exploring integrative models of resilient ecotourism development.

Existing literature on ecotourism predominantly addresses environmental conservation and community empowerment but often lacks a systematic conceptual integration of tourism resilience [7]. In the current era of environmental and social disruption, the long-term sustainability of ecotourism destinations hinges not only on conservation efforts but also on their capacity to anticipate, absorb, and adapt to external stressors [8]. Thus, there is a critical need to reconceptualize ecotourism development through the lens of resilience.

This article aims to develop and present a conceptual model for resilient ecotourism development in Bukit Lawang by integrating ecological, social, economic, and governance dimensions. The study contributes to bridging the knowledge gap in sustainable regional planning through a resilience-oriented tourism framework [9]. It also offers a foundational basis for future empirical research and strategic policy formulation aimed at enhancing both destination sustainability and community welfare.

2. LITERATURE REVIEW

2.1 Sustainable development

Sustainable development has become a fundamental paradigm in contemporary spatial planning and resource management. First popularized through Mkono and Hughes [10], the concept emphasizes meeting present needs without compromising the ability of future generations to meet their own. It encompasses four interrelated dimensions—economic, social, environmental, and cultural—which must be integrated into a balanced development strategy [11].

In ecotourism areas such as Bukit Lawang, sustainable development serves as a guiding framework for managing ecologically sensitive resources while fostering community participation and safeguarding environmental carrying capacity [12]. Rather than pursuing growth in isolation, development efforts in these contexts must embed long-term resilience against socio-environmental risks.

2.2 Ecotourism

Ecotourism is defined as responsible travel to natural areas that conserves the environment, sustains the well-being of local people, and involves interpretation and education [13]. It seeks to integrate conservation goals with community-based development and economic empowerment, forming a multidimensional and participatory tourism model [14].

According to the Directorate General of Destination Development, key principles of ecotourism include conservation, education, local participation, and economic sustainability [15]. In Bukit Lawang, these principles are reflected in community-managed homestays, orangutan conservation programs, and environmental education for visitors [16]. However, the region also faces mounting ecological pressures due to ecosystem degradation and uncontrolled tourism flows—highlighting the need for adaptive management frameworks.

2.3 Resilient tourism

Resilient tourism refers to strategic approaches that enhance a destination's capacity to adapt to, absorb, and recover from shocks such as natural disasters, climate change, and socio-economic crises [17]. Resilience in tourism goes beyond physical infrastructure; it encompasses community preparedness, local economic diversification, and responsive governance systems.

This concept has gained increased relevance in the wake of global disruptions, particularly the COVID-19 pandemic, which exposed the structural vulnerabilities of the global tourism sector [18]. Recent studies advocate for integrative models that combine disaster risk reduction, social resilience, and environmental adaptation within tourism planning.

In the context of Bukit Lawang, the flash floods of 2003 and 2015 underscore the urgency of embedding resilience into ecotourism systems [19]. A synthesis of ecotourism principles with resilience thinking is essential to ensure the continuity of the region as a sustainable destination and a functioning socio-ecological system.

2.4 Community well-being

Community well-being reflects the multidimensional quality of life encompassing economic prosperity, social cohesion, health, education, and safety [20]. Within tourism-based regional development, well-being is not limited to income generation but also involves local participation, agency, and cultural identity.

Inclusive and community-driven ecotourism can act as a catalyst for enhancing well-being through employment creation, local entrepreneurship, and cultural preservation [21]. However, overdependence on tourism heightens vulnerability during crises, necessitating resilient and diversified development models to sustain community welfare over time.

2.5 Theoretical synthesis and conceptual linkages

The four theoretical pillars above collectively form the foundation for constructing a conceptual model of resilient ecotourism development [22]. Sustainable development serves as the overarching framework that binds the ecological, social, economic, and institutional elements of tourism planning. Ecotourism provides the operational platform through which conservation and community empowerment are realized. Resilient tourism introduces a critical adaptive layer that enables destinations to withstand disruptions and recover efficiently. Meanwhile, community well-being functions as the ultimate objective, achievable only when sustainability and resilience are implemented in tandem.

Accordingly, ecotourism destinations like Bukit Lawang require integrated design models that go beyond conservation to encompass crisis-readiness and equitable community development. A robust conceptual framework must therefore synthesize these dimensions to support long-term viability and inclusive growth in socio-ecologically fragile regions.

3. THEORETICAL FRAMEWORK AND CONCEPTUAL MODEL

The conceptual model developed in this study is grounded in an interdisciplinary synthesis of four major theoretical pillars: sustainable development, ecotourism, tourism resilience, and community well-being. These frameworks are integrated to explain how ecotourism-based development in socio-ecologically sensitive areas can foster long-term community welfare while maintaining adaptive capacity to external shocks.

Sustainable development serves as the overarching paradigm that balances ecological integrity, social equity, and economic viability. Ecotourism, as a practical application of this paradigm, emphasizes environmentally responsible tourism that actively involves and benefits local communities. Meanwhile, the theory of tourism resilience introduces a critical dimension of risk adaptation, particularly relevant for destinations prone to environmental and socio-economic disturbances [23]. Finally, community well-being is positioned as the ultimate outcome of tourism development, encompassing not only economic gains but also social empowerment, cultural preservation, and safety. Building on these perspectives, the model proposes four interlinked constructs:

a) Ecotourism Development–improvements in natural attraction quality, conservation practices, visitor education, and local cultural engagement.
b) Tourism Resilience–the capacity to absorb and adapt to crises through preparedness, income

diversification, and risk governance.

c) Community-Based Governance–inclusive, participatory, and transparent management structures involving local stakeholders in decision-making.
d) Community Well-being–multidimensional benefits reflected in improved income, access to basic services, cultural identity, and perceived safety.

The hypothesized relationships among these constructs are illustrated in Figure 1. Ecotourism Development is expected to enhance Community Well-being both directly and indirectly through Tourism Resilience. Community-Based Governance is hypothesized to positively influence Tourism Resilience and Community Well-being either directly or indirectly as an enabling mechanism. Although Community-Based Governance and Tourism Resilience share common features such as participatory planning and stakeholder involvement, each represents a distinct theoretical construct. Community-Based Governance refers explicitly to institutional frameworks, transparent decision-making processes, accountability, and collaborative mechanisms involving various stakeholders. In contrast, Tourism Resilience focuses on adaptive capacity, preparedness, and the ability of tourism systems and communities to effectively respond to disruptions like natural disasters, economic crises, and environmental threats. Governance thus serves primarily as a structural enabler, while resilience emphasizes dynamic and operational adaptability. Clearly differentiating these constructs enables more precise theoretical definitions and targeted policy actions.

This model provides a testable framework for empirical validation using Structural Equation Modeling (SEM), allowing for the evaluation of both direct and mediated pathways through which tourism development affects local communities in vulnerable ecotourism areas such as Bukit Lawang.

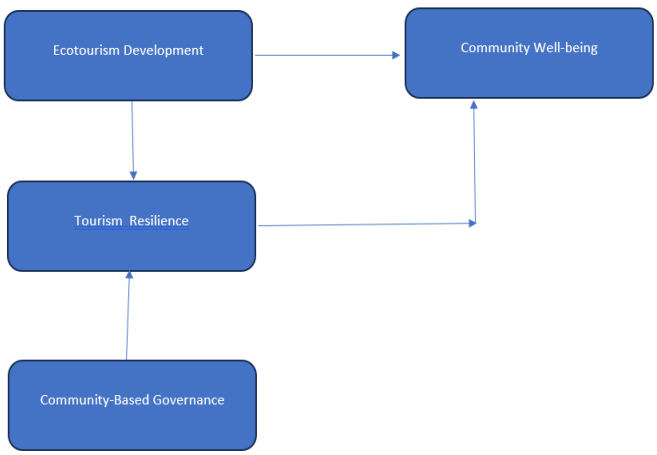

Figure 1. Conceptual framework of resilient ecotourism development

Despite the significant focus on resilience and sustainability in the ecotourism literature, there are still significant gaps in the integration of these concepts into practical, empirically tested models. Existing resilience tourism frameworks often emphasize theoretical or descriptive knowledge, but rarely validate multidimensional constructs through robust empirical methods such as modeling structural equations. In addition, the nuanced interplay between governance structures, resilience mechanisms, and community well-being remains understudied, especially in socio-ecologically vulnerable destinations such as Bukit Lawang. This study addresses these gaps explicitly by empirically testing a conceptual model that combines the development, resilience, community leadership, and well-being of ecotourism, contributing to both theoretical improvements and practical guidance for sustainable tourism management.

4. METHODS

4.1 Research design

This study employs a quantitative explanatory research design aimed at validating a conceptual model of resilient ecotourism development [24]. The objective is to empirically examine the hypothesized causal relationships among four latent constructs: Ecotourism Development, Tourism Resilience, Community-Based Governance, and Community Well-being.

Given the interrelated and multidimensional nature of these constructs, SEM is adopted as the primary analytical technique. Specifically, PLS-SEM is utilized due to its suitability for theory development and its robustness with relatively small to moderate sample sizes. In addition, Confirmatory Factor Analysis (CFA) is applied to evaluate the measurement model in terms of reliability and construct validity. The research design follows a deductive logic, progressing from theoretical hypotheses to empirical validation, and allows for the simultaneous testing of both direct and indirect relationships among variables.

4.2 Population and sampling

The study is conducted in Bukit Lawang, Langkat Regency, North Sumatra, Indonesia—a well-known ecotourism destination with high socio-ecological sensitivity. The target population consists of local stakeholders directly involved in tourism-related activities, such as homestay operators, tour guides, small business owners, and tourism managers.

A stratified purposive sampling method is employed to ensure balanced representation across stakeholder groups. While a minimum sample size of 200 respondents was originally targeted to ensure model robustness, a total of 150 valid responses were obtained due to time and logistical constraints [25]. This sample size remains acceptable for PLS-SEM analysis considering the complexity and context of the model.

4.3 Data collection

Primary data were collected through a structured questionnaire consisting of five main sections: (1) respondent demographics, (2) ecotourism development, (3) tourism resilience, (4) community-based governance, and (5) community well-being. Each construct was measured using a series of Likert-scale items (1=Strongly Disagree to 5=Strongly Agree), adapted from validated scales in prior studies and refined through expert consultation and a pilot test involving 30 respondents.

Ethical clearance was secured from the affiliated institution, and informed consent was obtained from all participants prior to data collection. The survey was administered face-to-face by trained enumerators to ensure accuracy and clarity in response interpretation across diverse linguistic and cultural backgrounds.

4.4 Measurement of variables

The four latent variables in the model are operationalized through a series of validated indicators, each adapted from previous literature. First, ecotourism development is measured using items related to environmental conservation efforts, visitor education programs, community involvement, and preservation of local culture. Second, tourism resilience is measured through indicators of disaster preparedness, diversification of local income sources, risk management practices, and early warning mechanisms.

Third, community-based governance is captured through items reflecting participatory planning, transparency, partnership with local government and private actors, and accountability mechanisms [26]. Fourth, community well-being is operationalized through multidimensional measures of income adequacy, access to basic services (education and health), cultural pride, and perceived safety. All measurement items are subject to reliability and validity testing before inclusion in the SEM analysis.

4.5 Data analysis technique

Data analysis was performed in two major phases. First, the measurement model was assessed through CFA using SmartPLS 4.0 to evaluate convergent validity (Average Variance Extracted ≥0.50), composite reliability (CR ≥0.70), and indicator loadings (≥0.60). Discriminant validity was also examined to ensure construct independence.

Second, PLS-SEM was used to estimate the structural model and test the hypotheses. Evaluation criteria included path coefficients (β), t-statistics, p-values, R^2 values (explained variance), Q^2 values (predictive relevance), and Standardized Root Mean Square Residual (SRMR) for model fit assessment. To assess mediation effects, a bootstrapping procedure with 5,000 resamples was employed to estimate the significance of indirect effects. All statistical outputs were interpreted at a significance level of $p<0.05$, unless otherwise specified.

4.6 Limitations

One of the limitations of this study is the relatively small sample size (n=150), which is below the threshold typically recommended for complex PLS-SEM models. Although PLS-SEM is resilient to smaller sample studies, this limitation may affect the generalizability and statistical power of the results. Future studies should consider replicating this study with larger and more diverse samples in order to strengthen the validity and applicability of the proposed model.

5. RESULT

5.1 Respondent profile

The study involved 150 valid respondents representing stakeholders directly engaged in ecotourism activities in Bukit Lawang, including local residents, tourism entrepreneurs, destination managers, and community representatives. Most respondents were within the productive age range (25-45 years), had completed secondary or tertiary education, and were actively involved in tourism-related professions, such as homestay operators, tour guides, and small business owners. This demographic composition suggests a community with substantial engagement and awareness in the operational dynamics of the tourism sector.

5.2 Validity and reliability testing

Measurement validity and reliability were evaluated using CFA. As presented in Table 1, all standardized factor loadings exceeded 0.60, the Average Variance Extracted (AVE) values surpassed the 0.50 threshold, and Composite Reliability (CR) values were above 0.70, indicating adequate convergent validity and internal consistency.

Table 1. Convergent validity and composite reliability of constructs

Construct	Item	Factor Loading	AVE	CR	Cronbach's Alpha
Ecotourism Development	Environmental conservation efforts	0.81	0.65	0.88	0.83
	Visitor education programs	0.78			
	Local community participation	0.83			
	Preservation of local culture	0.80			
Tourism Resilience	Disaster preparedness measures	0.84	0.67	0.89	0.85
	Income diversification	0.79			
	Risk management practices	0.86			
	Early warning mechanisms	0.80			
Community-Based Governance	Participation in decision-making	0.82	0.66	0.89	0.85
	Transparency and inclusiveness	0.84			
	Effective partnerships	0.79			
	Accountability of community leaders	0.80			
Community Well-being	Income adequacy	0.81	0.68	0.89	0.85
	Access to essential services (education, health)	0.84			
	Cultural pride	0.83			
	Perceived community safety	0.82			

5.3 Structural model assessment

Table 2. Structural model evaluation

Evaluation Indicator	Value	Criterion
R^2–Community Well-being	0.652	Moderate–Strong
R^2–Tourism Resilience	0.601	Moderate
Q^2–Predictive Relevance	>0	Predictive
SRMR–Model Fit	<0.08	Acceptable Fit

The structural model was assessed using PLS-SEM via SmartPLS. As shown in Table 2, the model demonstrated an acceptable fit with predictive relevance. The R^2 value for Community Well-being was 0.652, and for Tourism Resilience, it was 0.601—indicating moderate to strong

explanatory power. The SRMR was below the 0.08 threshold, and the Q^2 value was greater than zero, indicating predictive relevance.

5.4 Hypothesis testing

All hypothesized relationships were statistically significant at $p < 0.001$, with t-statistics exceeding the minimum threshold of 1.96. The strongest effect was observed between Ecotourism Development and Tourism Resilience (H2), followed by the effect of Ecotourism Development on Community Well-being (H1). Full results are shown in Table 3.

Table 3. Hypothesis testing results

Hypothesis	Relationship	Path Coefficient (β)	T-Statistic	P-Value	Conclusion
H1	Ecotourism Development→Community Well-being	0.422	6.714	<0.001	Supported
H2	Ecotourism Development→Tourism Resilience	0.487	7.136	<0.001	Supported
H3	Tourism Resilience→Community Well-being	0.316	4.831	<0.001	Supported
H4	Community-Based Governance→Tourism Resilience	0.293	3.987	<0.001	Supported
H5	Community-Based Governance→Community Well-being	0.210	2.674	<0.01	Supported

5.5 Mediation analysis and total effects

A mediation analysis revealed that Tourism Resilience partially mediates the relationship between Ecotourism Development and Community Well-being. This indicates that the development of ecotourism enhances well-being not only directly but also indirectly by strengthening the adaptive and crisis-response capacities of the tourism system. The mediation was confirmed through bootstrapping procedures, where the indirect effect was significant at $p<0.001$.

In addition to testing the direct relationships, a mediation analysis was carried out to investigate the indirect effects of the conceptual model. Specifically, the indirect impact of community-based governance on community well-being through tourism resilience (governance →resilience →well-being) was evaluated using a boot procedure of 5,000 repeat samples. The results showed a statistically significant indirect effect, confirming that tourism resilience partially mediates the link between community-based management and community well-being. This finding highlights the critical role of resilience-building measures as an important intermediary through which participatory leadership impacts community outcomes. Future research should further explore this mediated pathway to improve our understanding of the resilience mechanisms of tourism-dependent communities.

5.6 Key findings

This study produced several important findings. First, Ecotourism Development significantly influences Community Well-being ($\beta=0.422$, $p<0.001$) and is the strongest predictor of Tourism Resilience ($\beta=0.487$, $p<0.001$). Second, Tourism Resilience significantly enhances Community Well-being and acts as a partial mediator in the relationship between Ecotourism Development and Well-being. Third, Community-Based Governance supports resilience and equity in benefit distribution, with a moderate but statistically significant effect on both dependent variables. These findings validate the theoretical model and reinforce the importance of resilience and participatory governance as enabling factors in sustainable ecotourism planning.

6. DISCUSSION

This study empirically supports the proposed model, confirming that Ecotourism Development directly and indirectly enhances Community Well-being via Tourism Resilience [27]. The results reinforce the theoretical foundation that sustainable and participatory tourism development must be complemented by resilience-building efforts to yield meaningful and long-lasting socio-economic outcomes.

6.1 Ecotourism development as a direct driver of well-being

The findings demonstrate a strong and statistically significant relationship between Ecotourism Development and Community Well-being ($\beta=0.422$, $p<0.001$) [28]. This reinforces prior research suggesting that ecotourism—when rooted in environmental stewardship and local engagement—can be a multidimensional tool for improving income, strengthening cultural identity, and fostering community cohesion.

In Bukit Lawang, ecotourism practices such as homestays, wildlife conservation tours, and environmental education initiatives have tangibly enhanced livelihoods and local pride. These outcomes highlight the centrality of sustainable and inclusive tourism in driving socio-economic advancement [29]. However, the magnitude and durability of these benefits are contingent upon the institutional and environmental context in which ecotourism operates.

6.2 The mediating role of tourism resilience

One of the key findings is the partial mediation effect of Tourism Resilience in the relationship between Ecotourism Development and Community Well-being [30]. The indirect pathway was significant ($\beta\_indirect >0$, $p<0.001$ via bootstrapping), suggesting that development efforts yield greater social returns when integrated with adaptive mechanisms such as disaster preparedness and income diversification.

This echoes Lu et al. [31], who argue that resilience is not merely a protective factor, but a strategic enabler in volatile environments. For Bukit Lawang, which has suffered recurrent flash floods (2003, 2015), resilience is vital to safeguarding both infrastructure and socio-economic systems. The results validate that the presence of early warning systems, risk communication, and redundant livelihood sources strengthens the continuity of tourism-derived welfare.

6.3 Community-based governance as a structural enabler

Although the direct effect of Community-Based

Governance on Community Well-being is relatively modest (β=0.210, $p<0.01$), its influence on Tourism Resilience is more pronounced (β=0.293, $p<0.001$) [32]. This supports the notion that governance does not act in isolation but serves as a structural enabler for adaptive capacity and benefit distribution.

In Bukit Lawang, village-level tourism cooperatives and multi-stakeholder partnerships have fostered social trust, local ownership, and transparency—elements critical for institutional resilience [33]. While governance may yield slower direct economic returns, it lays the foundation for long-term stability and equitable development.

6.4 Theoretical contributions

This study contributes to theoretical development by offering an integrated model that combines sustainability, resilience, community-based governance, and well-being into a coherent framework [34]. The validation of partial mediation through Tourism Resilience advances current understanding of how complex interactions among constructs manifest in real-world settings.

The model's empirical robustness—evidenced by $Q^2>0$ (predictive relevance), SRMR <0.08 (model fit), and $R^2=0.652$ for community well-being—demonstrates its potential applicability across other ecotourism contexts [35]. It also emphasizes that governance and resilience are not passive variables but active dimensions shaping developmental outcomes under conditions of uncertainty.

6.5 Practical and policy implications

From a policy perspective, the findings suggest that interventions should go beyond physical development and address the systemic factors that mediate tourism outcomes [36]. Investments should be directed toward:

- Capacity building in risk management for local actors
- Training programs that enhance disaster readiness and economic diversification
- Governance structures that ensure inclusive participation and benefit-sharing

In particular, strengthening community-based governance not only improves trust and accountability but also acts as a lever to enhance destination resilience [37]. This dual approach—combining environmentally responsible development with adaptive institutional mechanisms—can help transform ecotourism into a proactive and resilient pathway for sustainable regional growth.

In integrating the findings of this study into strategies, policymakers and local tourism managers should consider the following specific recommendations:

6.5.1 Establishing community-based ecotourism committees

Establishing structured governance bodies that include local residents, tourism operators, conservation experts and local government representatives. These committees should ensure inclusive decision-making, transparency and equitable distribution of ecotourism benefits.

6.5.2 Implementing resilience training programmed

Organizing regular training seminars that focus on disaster preparedness, risk management and sustainable tourism practices. Modules should cover crisis response strategies, the use of early warning systems and livelihood diversification to reduce reliance on tourism alone.

6.5.3 Building local capacity through education and certification

Establishing certification programmed for ecotourism operators, guides and accommodation providers to improve service quality, environmental awareness and visitor education. Certified training should cover conservation techniques, cultural heritage management, visitor engagement and safety protocols.

6.5.4 Develop integrated risk management systems

Invest in early warning and integrated risk communication systems that provide timely and accurate information about potential environmental and socio-economic disruptions. Such systems should be integrated into community structures and regularly tested through simulation exercises.

7. CONCLUSION

This study demonstrates that ecotourism development significantly enhances community well-being when supported by community-based governance and strengthened through tourism resilience. The findings validate a conceptual model in which resilience partially mediates the relationship between development initiatives and social outcomes, highlighting the importance of adaptive capacity in vulnerable destinations like Bukit Lawang. With acceptable model fit and predictive relevance, the research advances the integration of sustainability, governance, and resilience in tourism planning. Practically, the study emphasizes that resilient ecotourism requires not only environmental stewardship but also inclusive governance and proactive risk management. Future research may expand this framework to other ecotourism settings and incorporate longitudinal approaches to assess long-term community adaptation.

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APPENDIX

Measurement Items for Latent Constructs

- **Construct 1: Ecotourism Development**

1. Environmental conservation efforts in ecotourism sites are effectively implemented.
2. Visitor education programs effectively promote environmental awareness.
3. Local communities actively participate in ecotourism management.
4. Ecotourism initiatives strongly promote the preservation of local culture.

- **Construct 2: Tourism Resilience**

1. Our community has effective disaster preparedness measures in place.
2. Local income sources are sufficiently diversified beyond tourism.
3. Risk management practices are actively applied to mitigate tourism-related disruptions.
4. Early warning mechanisms are adequately developed and communicated within the community.

- **Construct 3: Community-Based Governance**

1. Local communities actively participate in tourism planning decisions.
2. Tourism-related decision-making processes are transparent and inclusive.
3. Effective partnerships exist between the local community, government, and private stakeholders.
4. Community leaders are accountable for their decisions regarding ecotourism management.

- **Construct 4: Community Well-being**

1. Community members have adequate income derived from ecotourism.
2. Ecotourism activities enhance local access to essential services such as education and health.
3. Ecotourism fosters a strong sense of cultural pride among residents.
4. Residents perceive their community as safe and secure due to ecotourism.