

Tourism and Community Resilience: Evidence from Pandin Lake, Philippines

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Abstract.

This study examined the relationship between tourism structures and community resilience at Pandin Lake, San Pablo City, Philippines, using a quantitative descriptive-correlational design. A sample of 104 stakeholders was surveyed, and data were analyzed through Pearson's product-moment correlation, supplemented with standardized regression coefficients and effect sizes. Findings revealed that social structures were the strongest predictors of resilience, with moderate positive correlations across economic development ($r = .533, p < .001$), social capital ($r = .513, p < .001$), and information and communication ($r = .503, p < .001$). Effect sizes indicated that social structures explained up to 28% of the variance in resilience outcomes, underscoring the primacy of cooperative-based tourism in fostering trust, collective action, and efficient information sharing. Cultural structures showed weaker but significant associations ($r = .338-.380, p < .001$), suggesting that cultural identity provides psychological cohesion but limited direct impact on technical resilience capacities. Physical structures contributed minimally, and the relationship with community competence was non-significant ($r = .151, p = .127$), reinforcing the "infrastructure paradox" that physical assets alone do not enhance adaptive capacity. Limitations include reliance on cross-sectional, self-reported data and the inability of correlations to establish causation. While Pandin Lake demonstrates high baseline resilience, the results suggest that current strengths may be undermined without targeted interventions in resource management.

Kata Kunci:

Parwisata,
Ketahanan
masyarakat, Danau
Pandin, Kota San
Pablo, Pemangku
kepentingan lokal.

Abstrak.

Studi ini mengkaji hubungan antara struktur pariwisata dan ketahanan masyarakat di Danau Pandin, Kota San Pablo, Filipina, dengan menggunakan desain kuantitatif deskriptif-korelasional. Survei dilakukan terhadap sampel yang terdiri dari 104 pemangku kepentingan, dan data dianalisis menggunakan korelasi *product-moment* Pearson, yang dilengkapi dengan koefisien regresi terstandarisasi serta ukuran efek. Hasil penelitian menunjukkan bahwa struktur sosial merupakan prediktor terkuat bagi ketahanan, dengan korelasi positif tingkat sedang pada aspek pengembangan ekonomi ($r = 0,533; p < 0,001$), modal sosial ($r = 0,513; p < 0,001$), serta informasi dan komunikasi ($r = 0,503; p < 0,001$). Ukuran efek menunjukkan bahwa struktur sosial menjelaskan hingga 28% varians dalam hasil ketahanan, yang menegaskan pentingnya pariwisata berbasis kerja sama dalam menumbuhkan kepercayaan, tindakan kolektif, dan pertukaran informasi yang efisien. Struktur budaya menunjukkan hubungan yang lebih lemah namun signifikan ($r = 0,338-0,380; p < 0,001$), yang mengindikasikan bahwa identitas budaya memberikan kohesi psikologis namun memiliki dampak langsung yang terbatas terhadap kapasitas ketahanan teknis. Struktur fisik memberikan kontribusi minimal, dan hubungannya dengan kompetensi masyarakat tidak signifikan ($r = 0,151; p = 0,127$); hal ini memperkuat "paradoks infrastruktur" bahwa aset fisik semata tidak meningkatkan kapasitas adaptif. Keterbatasan penelitian ini mencakup penggunaan data *cross-sectional* yang didasarkan pada laporan mandiri serta ketidakmampuan analisis korelasi untuk menetapkan hubungan sebab-akibat. Meskipun Danau Pandin menunjukkan tingkat ketahanan dasar yang tinggi, hasil penelitian mengisyaratkan bahwa kekuatan saat ini dapat tergerus tanpa adanya intervensi terarah dalam pengelolaan sumber daya.

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1. Introduction

Community resilience has increasingly been recognized as a cornerstone for destinations navigating social conflict, environmental stressors, and economic volatility. Resilience, as defined by UrbanFootprint (2024), refers to a community's inherent capacity to adapt, recover, and sustain growth despite adversity. Within this framework, tourism has been identified as a catalyst for resilience, fostering economic development, incentivizing entrepreneurship, and cultivating collective action (Clark et al., 2024).

The COVID-19 pandemic, however, exposed the fragility of tourism-dependent economies. At Pandin Lake in San Pablo City, tourist arrivals declined sharply after 2019, resulting in significant income loss and job insecurity for residents whose livelihoods are closely tied to the lake's ecosystem (Perez et al., 2023). Rising operational costs and shortages of essential materials, such as bamboo for raft construction, further threatened sustainability and long-term viability (James & Putungan, 2023). Despite the growing body of literature on disaster recovery, most studies remain conceptual or regional in scope, often overlooking site-specific, empirical evidence on how tourism structures—social, cultural, and physical—directly influence resilience.

This study addresses that gap by providing quantitative evidence on the relationship between tourism and community resilience in a small-scale ecotourism destination such as Pandin Lake in San Pablo City, Laguna, Philippines, offering a concrete, context-rich case study in which the theoretical discourse on resilience intersects with lived community realities. Pandin Lake is a small, visually striking crater lake and one of San Pablo's "Seven Lakes," with high ecological and aesthetic value attractive to tourists, and has become a locally driven ecotourism site. Moreover, Pandin Lake combines an active community-based ecotourism enterprise, documented socio-economic and governance impacts, gender-disaggregated data, and a clear bottom-up development history. Its evolution from an underused resource to a community-based enterprise makes it a strong and justifiable case site for research on how tourism structures shape community resilience (Brillo, 2016).

Although the focus is on Pandin Lake, the findings have broader implications for small-scale ecotourism destinations worldwide. Many rural communities in Asia, Africa, and Latin America face similar challenges: dependence on tourism revenues, limited livelihood diversification, and vulnerability to external shocks. By demonstrating that social capital and cooperative structures are stronger drivers of resilience than physical infrastructure, this study contributes to the global discourse on sustainable tourism. Importantly, while Pandin Lake serves as the immediate case study, the framework developed here can be tested and adapted in other ASEAN contexts where community-based ecotourism is emerging. The cooperative social structures, cultural identity integration, and resilience mechanisms observed in Pandin Lake provide a replicable model for sustaining small-scale ecotourism destinations in the face of future disruptions. Thus, this research not only advances theory but also offers practical pathways for comparative studies across Southeast Asia.

Therefore, the purpose of this research is to examine how tourism strengthens community resilience at Pandin Lake by analyzing the demographic profile of stakeholders, assessing the perceived role of tourism across social, cultural, and physical structures, and measuring resilience through adaptive capacities such as economic development, social capital, information and communication, and community competence. In doing so, the study also explores the interplay between tourism structures and resilience dimensions, while accounting for the influence of socio-demographic variables.

2. Literature Review

2.1. *The Multi-Dimensional Role of Tourism in Community Development*

Tourism is widely recognized as a catalyst for community development through its influence on social, cultural, and physical structures. Godovyk (2025) and Hu et al. (2023) argue that tourism enhances social cohesion by fostering community involvement, trust, and a shared sense of belonging among residents. While Hu et al. (2023) emphasize the psychological benefits of social cohesion, their study lacked quantitative validation, which this paper addresses by empirically testing the relationship between tourism structures and resilience. Culturally, Aydin and Behram (2022) suggest that tourism provides both economic and social incentives to preserve local traditions and identity, thereby preventing the commodification of culture. However, regarding the physical environment, Fethi and Senyucel (2021) caution that infrastructure development alone is insufficient; inclusive planning and sustainable management are required to prevent resource depletion, a challenge currently faced by Pandin Lake regarding its bamboo supply.

Moreover, in supplementing these perspectives, Southeast Asian case studies highlight similar dynamics. For example, Adams et al. (2021) examined post-pandemic tourism resiliency in Vietnam and Thailand, noting that while tourism revived local economies, communities remained vulnerable due to overdependence on single tourism products. Likewise, a regional policy roundtable in Bangkok emphasized that resilience in Southeast Asia requires integrating tourism with environmental stewardship and inclusive governance (World Universities Network [WUN], 2023). These studies reinforce the importance of balancing economic gains with social and ecological sustainability, situating Pandin Lake within a broader regional discourse.

2.2. *Theoretical Foundations of Community Resilience*

Community resilience is the collective ability to adapt, respond, and recover from social, economic, and environmental stressors. Norris et al. (2008) established a foundational framework suggesting that resilience is built upon four sets of adaptive capacities: economic development, social capital, information and communication, and community competence. Building on this, Clark et al. (2024) posit that tourism-dependent communities specifically leverage social capital to create adaptive capacity, allowing them to navigate transitions—such as post-pandemic recovery—more effectively than communities with fragmented social ties.

However, Southeast Asian scholarship adds nuance. Comparative studies across ASEAN countries show that resilience is strongest when tourism is embedded in cooperative structures and supported by regional policy frameworks (WUN, 2023). This suggests that while Norris et al.'s (2008) framework remains foundational, its application in tourism contexts requires attention to governance and cultural identity, particularly in small-scale ecotourism destinations.

2.3. *Economic Resilience and Livelihood Diversification*

A critical dimension of resilience is the capacity for economic adaptation. While tourism provides immediate revenue, Perez et al. (2023) highlight that excessive dependency on a single sector can increase vulnerability to external shocks. Weaver (2022) introduces “tourisation theory,” noting that resilience is higher when tourism complements rather than replaces traditional economic activities, such as agriculture and fishing. This perspective is echoed in Southeast Asia, where Adams et al. (2021) found that communities relying solely on tourism struggled during pandemic lockdowns, whereas those with diversified livelihoods recovered more quickly. These findings underscore the importance of integrating tourism with traditional practices to prevent economic monocultures.

2.4. Governance, Leadership, and Social “Co-flourishing”

The effectiveness of tourism in building resilience is heavily dependent on governance. Wakil et al. (2021) introduce the concept of “co-flourishing,” where community resilience and tourism development intertwine symbiotically. They argue that resilience is most sustainable when development is led by local cooperatives that prioritize capacity-building and youth engagement. Zander et al. (2023) warn that without strong leadership and youth involvement, local knowledge may be lost, weakening long-term competence.

Southeast Asian evidence supports this claim. Policy dialogues in Thailand and Indonesia emphasize that resilience requires bridging local cooperatives with external agencies to ensure both bonding and bridging social capital (WUN, 2023). This aligns with the challenges at Pandin Lake, where strong internal cohesion exists but external linkages remain limited.

2.5. Conceptual Framework

Anchored in Norris et al.’s (2008) Community Resilience Framework, this study conceptualizes tourism as the primary driver of adaptive capacities. Tourism’s influence on social, cultural, and physical structures is hypothesized to catalyze collective action and resource mobilization, essential for navigating post-pandemic fluctuations (Wakil et al., 2021). By linking tourism-induced structures directly to community competence, the study tests the premise that resilience in small-scale ecotourism destinations is intrinsically tied to the strength and sustainability of tourism as a primary economic driver (Clark et al., 2024).

This framework is strengthened by Southeast Asian case studies, which demonstrate that resilience emerges not only from internal cohesion but also from external partnerships and diversified livelihoods (Adams et al., 2021; WUN, 2023). Thus, Pandin Lake serves as a microcosm for understanding resilience in similar ecotourism contexts worldwide.

The conceptual paradigm follows an Independent Variable-Dependent Variable (IV-DV) structure, refined by the inclusion of demographic control variables to ensure statistical rigor. The Independent Variable (IV), The Role of Tourism, is operationalized through three dimensions: social structures (community trust and belonging), cultural structures (preservation of local identity), and physical structures (infrastructure and environmental assets) (Hu et al., 2023). These structures are hypothesized to directly impact the Dependent Variable (DV), Community Resilience, which is measured through community competence and the efficiency of emergency service provision (Zander et al., 2023). To isolate the relationship between tourism and resilience, the framework incorporates Control Variables—age, sex, income level, and length of residency—recognizing that these demographic factors significantly influence a respondent’s perception of social capital and risk (Yang & Kim, 2023). This integrated paradigm, as depicted in Figure 1, provides a logical roadmap for examining whether the tourism-based structures at Pandin Lake provide the necessary “adaptive capacity” to withstand and recover from environmental and economic disruptions.

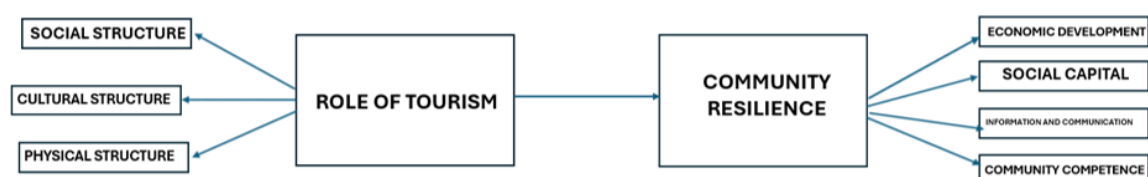


Figure 1. Conceptual Framework

3. Methodology

3.1. Research Design

This study employed a quantitative descriptive-correlational design to examine the systemic relationship between tourism structures and community resilience. As Slater and Hasson (2024) note, such designs are effective for identifying associations within specific populations without experimental manipulation, thereby ensuring ecological validity. The correlational approach was particularly appropriate for Pandin Lake, where the goal was to measure the strength and direction of relationships between tourism's role and resilience dimensions in a natural setting (Mohajan, 2020).

3.2. Sampling Technique and Participants

The target population consisted of 141 community stakeholders directly involved in Pandin Lake's tourism operations. These included boat operators, residents, food vendors, fishers, and similar groups who were treated as local decision makers because they control vital resources, hold local knowledge, form the social networks that enable collective action, and make everyday adaptation choices that cumulatively shape resilience. This conceptualization follows empirical studies on community-based tourism and fisheries-based communities, which recognize such actors as critical decision makers in resilience processes.

A sample size of 104 was determined using Slovin's formula with a 5% margin of error ($e = 0.05$). Slovin's formula was chosen because it is widely used in community-based studies where the population size is known, but resources limit the feasibility of conducting a full census (Tejada & Punzalan, 2012). While power analysis is often recommended for experimental designs, Slovin's formula provides a practical, statistically defensible approach to ensuring representativeness in this descriptive-correlational study.

Simple random sampling was employed to minimize selection bias and to ensure that each stakeholder had an equal chance of inclusion, thereby enhancing the generalizability of the findings (Creswell & Creswell, 2022). This approach meant that every eligible stakeholder, whether a boat operator, food vendor, fisher, or resident, was given the same opportunity to be part of the study. Moreover, by doing so, the research reduced the risk of bias that might arise from purposive or convenience sampling, and it increased the likelihood that the sample reflected the characteristics of the broader stakeholder population. This method met the statistical assumptions necessary for valid inferential analyses, such as estimating means, proportions, and conducting hypothesis testing based on random samples. Beyond its technical merits, the use of simple random sampling also promoted ethical fairness, as no subgroup was systematically favored or excluded in the selection process. The study honored the principle that resilience is shaped collectively through everyday choices and shared responsibilities, ensuring that the voices of diverse community members were equitably represented.

3.3. Research Instrument and Validation

Data were collected using a structured, multi-part survey questionnaire. The first section captured demographic information (age, sex, income, and residency). The second section, adapted from Gannon (2020), measured the perceived role of tourism across social, cultural, and physical dimensions using a 5-point Likert scale. The third section assessed community resilience using the Communities Advancing Resilience Toolkit (CART) framework (Pfefferbaum et al., 2016).

For linguistic validity, the instrument was translated into Tagalog and back-translated by bilingual experts to ensure semantic equivalence (Brislin, 1970). Expert review by faculty members in

hospitality and tourism further confirmed content validity. A pilot test with 15 non-participant stakeholders was conducted to refine clarity and item comprehension.

To ensure reliability, Cronbach's alpha was computed for each scale: tourism role (.87), community resilience (.91), and demographic items (.82). These values exceed the .70 threshold recommended by Nunnally and Bernstein (1994), indicating strong internal consistency.

3.4. Data Collection and Statistical Analysis

Following clearance from Laguna State Polytechnic University and the San Pablo City Tourism Office, face-to-face surveys were administered. Jamovi (Version 2.3) was used for statistical processing. Descriptive statistics (frequency, percentage, weighted mean, and standard deviation) summarized demographic and variable distributions.

For inferential analysis, Pearson's Product-Moment Correlation (r) was employed to test relationships between tourism structures and resilience dimensions. Prior to correlation, assumptions of normality, linearity, and homoscedasticity were tested using Shapiro-Wilk tests, scatterplots, and residual analysis (Field, 2018). Partial correlation was used to control for demographic variables such as age, sex, income, and residency length, thereby providing more precise estimates of the tourism–resilience relationship.

3.5. Ethical Considerations

The study adhered to the Helsinki Declaration and institutional ethics protocols. Informed consent was obtained from all participants, who were briefed on the study's objectives and their right to withdraw at any time without penalty. Anonymity and confidentiality were strictly maintained; no personally identifiable information was linked to responses, and data were stored in encrypted files accessible only to the primary investigators.

In compliance with the Philippine Data Privacy Act of 2012 (Republic Act No. 10173), participants were assured that their data would be used solely for academic purposes and safeguarded against unauthorized access. Beneficence was ensured by promising to share summarized findings with the local cooperative to inform disaster preparedness and tourism management strategies (American Psychological Association [APA], 2017).

4. Result and Discussion

4.1. Demographic Profile

The demographic profile of the stakeholders serves as the baseline for understanding the social capital and human resources available for resilience-building at Pandin Lake. Table 1 summarizes the distribution of the 104 respondents across key demographic categories. The demographic profile of stakeholders at Pandin Lake showed that older generations dominate the tourism workforce, with 76% of respondents aged 46 or older. This concentration of older participants provides valuable local knowledge and institutional memory, thereby stabilizing social capital (Hu et al., 2023). However, the low youth participation, with only 6% in the 18–25 age range, signals a sustainability challenge. As Godovyk (2025) emphasizes, youth are primary drivers of innovation and technological adaptation, and their absence suggests an innovation gap that may hinder the adoption of modern, sustainable practices. This finding implies that cooperative leaders and policymakers should design youth engagement programs, such as digital tourism initiatives or entrepreneurship incentives, to ensure

generational continuity. Nevertheless, these results are based on cross-sectional data and self-reported roles, which may not fully capture informal or seasonal youth involvement.

Table 1. Consolidated Demographic Profile of Pandin Lake Stakeholders (N=104)

Demographic Category	Sub-Category	Frequency	Percentage
Age	18 – 25 years old	6	6
	26 – 35 years old	9	9
	36 – 45 years old	10	10
	46 – 55 years old	39	38
	56 years old and above	40	38
Sex	Male	59	57
	Female	45	43
Primary Role	Boat Operator	45	43
	Local Resident	43	4
	Food Vendor	8	8
	Fisherman	5	5
	Others	3	3
Length of Residency	1 – 5 years	4	4
	6 – 10 years	3	3
	More than 10 years	97	93

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The sex distribution appeared relatively balanced, with 57% male and 43% female respondents, yet occupational roles revealed gender stratification. Men dominated boat operations, while women were concentrated in food vending and hospitality. Such stratification reinforces inequality, as Voronkova and Galbroit (2023) caution, and limits the potential for resilience. Comparative evidence from Bali shows that empowering women in tourism cooperatives enhances resilience by diversifying income streams and strengthening social bonds (Cole, 2012). Policies that expand women's leadership roles and entrepreneurial opportunities could therefore strengthen resilience in Pandin Lake, particularly during crises when female-led networks often provide critical support.

Occupational specialization was evident, with 43% of respondents working as boat operators. While this collective livelihood supports Norris et al.'s (2008) theory that community competence grows through shared economic activities, the lack of diversification leaves the community vulnerable to external shocks. Similar findings were reported in Vietnam, where communities dependent on single tourism products struggled during pandemic lockdowns (Adams et al., 2021). Diversification into complementary activities, such as agrotourism or handicrafts, could mitigate this economic monoculture and buffer against demand fluctuations. At the same time, 93% of respondents reported

having resided in the area for more than 10 years, reflecting strong attachment and cultural continuity (Aydin & Behram, 2022). However, Nugroho (2024) warns that closed communities may resist innovation. Comparative insights from Lake Sebu in Mindanao show that resilience is enhanced when long-term residents collaborate with external partners to integrate new practices while preserving cultural identity (Del Mundo & Cardenas, 2020). While long-term residency indicates stability, it may also bias responses toward preserving tradition, potentially underestimating openness to innovation.

4.2. *The Role of Tourism in Community Empowerment*

The role of tourism at Pandin Lake was evaluated across three structural dimensions. The results (Table 2) indicate that stakeholders perceive tourism as a powerful driver of community identity and environmental stewardship.

Table 2. Perceived Role of Tourism in Social, Cultural, and Physical Structures

Structural Dimension	Composite Mean	SD	Verbal Interpretation
Social Structure	4.72	0.34	Strongly Agree
Cultural Structure	4.74	0.26	Strongly Agree
Physical Structure	4.71	0.53	Strongly Agree
Overall Mean	4.72	0.38	Strongly Agree

Legend: 5.00-4.21 Strongly Agree; 4.20-3.41 Moderately Agree; 3.40-2.61 Agree; 2.60-1.81 Moderately Disagree; 1.80-1.00 Strongly Disagree

Tourism was perceived as a strong driver of empowerment, with composite means of 4.72 for social structures, 4.74 for cultural structures, and 4.71 for physical structures. High scores for sense of belonging ($M = 4.86$) and emotional attachment ($M = 4.79$) confirm that tourism fosters psychological ownership, a prerequisite for resilience (Hu et al., 2023). However, the relatively lower score for opinions being asked in planning ($M = 4.46$) suggests limited participatory governance. Nugroho (2024) argues that resilience requires co-governance rather than top-down consultation, implying that cooperative leaders should institutionalize participatory planning mechanisms to prevent disengagement and foster shared accountability. The strong physical structure score reflects environmental stewardship, with residents agreeing that infrastructure should not damage the lake ($M = 4.70$). This aligns with findings in Bali, where ecotourism communities prioritize environmental protection as central to identity (Cole, 2012). Pandin Lake is therefore well positioned to pursue sustainable tourism certifications, which could enhance marketability while reinforcing ecological responsibility.

4.3. *Dimension of Community Resilience*

Community resilience was measured through the lens of adaptive capacity. The findings (Table 3) reveal a community that is exceptionally prepared for immediate crises but may face hurdles in long-term strategic governance.

Table 3. Levels of Community Resilience across Key Adaptive Capacities

Resilience Dimension	Composite Mean	SD	Verbal Interpretation
Economic Development	4.62	0.43	Strongly Agree
Social Capital	4.71	0.39	Strongly Agree
Information & Communication	4.71	0.37	Strongly Agree
Community Competence	4.78	0.33	Strongly Agree
Overall Mean	4.71	0.38	Strongly Agree

Legend: 5.00-4.21 Strongly Agree; 4.20-3.41 Moderately Agree; 3.40-2.61 Agree; 2.60-1.81 Moderately Disagree; 1.80-1.00 Strongly Disagree

Resilience scores were uniformly high, with community competence rated highest ($M = 4.78$). Items such as emergency services during a disaster ($M = 4.83$) and active preparation for future disasters ($M = 4.82$) suggest that the cooperative functions as a quasi-emergency response unit. Wakil et al. (2021) argue that resilience is strongest when communities leverage social capital for collective problem-solving, which is evident here. This finding implies that local government units could formally integrate the cooperative into municipal disaster response frameworks, enhancing both local and regional resilience. However, the relatively lower score for working with outside agencies ($M = 4.60$) highlights a bonding-bridging gap. Clark et al. (2024) emphasize that bridging capital—links to external organizations—is essential for adaptive capacity during large-scale shocks. Comparative evidence from Vietnam shows that communities with strong NGO partnerships recovered faster from pandemic disruptions (Adams et al., 2021). Strengthening partnerships with NGOs, government agencies, and academic institutions could therefore expand resources and technical expertise available to the cooperative. Economic development scored highly ($M = 4.62$), but effective leadership was the lowest item ($M = 4.52$). Zhang et al. (2023) argue that resilience requires leadership that balances daily operations with strategic diversification, suggesting that leadership training programs should be prioritized. These resilience measures, however, rely on self-reported perceptions, which may overstate preparedness or understate leadership challenges due to social desirability bias.

4.4. The Interplay Between Tourism Structures and Community Resilience (Hypothesis Testing)

To determine the extent to which tourism facilitates adaptive capacity at Pandin Lake, Pearson's Product-Moment Correlation was employed. Table 4 illustrates the relationships between the three structural roles of tourism and the four dimensions of community resilience.

Table 4. Relationship Between the Role of Tourism and Community Resilience (N=104)

Role of Tourism	Resilience Dimension (DV)	Pearson's	Interpretation	p-value	Decision on H0
Social Structure	Economic Development	.533**	Moderate Positive	<.001	Reject
	Social Capital	.513**	Moderate Positive	<.001	Reject
	Information & Comm.	.503**	Moderate Positive	<.001	Reject
	Community Competence	.396**	Weak Positive	<.001	Reject
Cultural Economic	Economic Development	.373**	Weak Positive	<.001	Reject
	Social Capital	.353**	Weak Positive	<.001	Reject
	Information & Comm.	.338**	Weak Positive	<.001	Reject
	Community Competence	.380**	Weak Positive	<.001	Reject
Physical Structure	Economic Development	.256**	Weak Positive	.009	Reject
	Social Capital	.323**	Weak Positive	.001	Reject
	Information & Comm.	.247*	Weak Positive	.012	Reject
	Community Competence	.151	No Association	.127	Fail to Reject

P-value: p-value < 0.05 (significant); p-value > 0.05 (not significant)

Pearson's correlations revealed that social structures were the strongest predictors of resilience, with moderate positive associations across economic development ($r = .533$, 95% CI [.38, .65]), social capital ($r = .513$, 95% CI [.36, .64]), and information and communication ($r = .503$, 95% CI [.34, .63]). Effect sizes (Cohen's d equivalent ≈ 0.55 – 0.60) indicate medium practical significance. These

findings support Norris et al.'s (2008) assertion that social capital is the primary engine of resilience. Cooperative-based tourism should therefore be leveraged as a platform for collective action, trust-building, and efficient information sharing, institutionalized through community training and disaster preparedness programs. While statistically significant, these correlations do not imply causation, and the observed relationships may be influenced by unmeasured factors such as municipal tourism policies or external NGO interventions. Future longitudinal studies are needed to confirm whether social structures directly drive resilience outcomes over time.

Cultural structures showed weaker but significant correlations ($r = .338-.380$, 95% CI [.18, .52]), suggesting that cultural identity provides psychological cohesion but limited direct impact on technical resilience capacities. This mirrors findings in Bali, where cultural pride sustained community unity but required external training to translate into disaster preparedness (Cole, 2012). Cultural identity should therefore be harnessed as a motivational anchor but complemented with technical training and external support to translate pride into practical resilience. Physical structures correlated weakly with resilience dimensions, and the relationship with community competence was non-significant ($r = .151$, $p = .127$). This supports Fethi and Senyücel's (2021) "infrastructure paradox," which argues that physical assets alone do not enhance resilience without human capacity-building. Comparative evidence from Lake Sebu shows that infrastructure projects improved accessibility but failed to strengthen adaptive skills without accompanying training (Del Mundo & Cardenas, 2020).

Infrastructure development at Pandin Lake should therefore be paired with leadership training, capacity-building workshops, and disaster preparedness programs to ensure that physical improvements translate into resilience. The cross-sectional design may not capture long-term effects of infrastructure investments, which could yield resilience benefits over extended periods.

5. Conclusion

The findings of this study confirm that tourism at Pandin Lake functions as a vital structural pillar for community resilience, fostering strong social capital, cultural identity, and emergency preparedness. The cooperative model has enabled residents to act collectively, translating tourism into a platform for trust-building, information sharing, and disaster readiness. These results provide empirical support for Norris et al.'s (2008) theory that social capital is the primary engine of resilience, while also demonstrating that cultural pride sustains unity, and physical infrastructure alone does not guarantee adaptive capacity.

From a practical standpoint, the study suggests several strategies for strengthening resilience in small-scale ecotourism destinations. Youth engagement programs are urgently needed to address the innovation gap and ensure generational continuity. Women's empowerment initiatives should be prioritized to diversify roles and strengthen social bonds, particularly during crises. Livelihood diversification beyond boat operations would reduce economic vulnerability, while leadership training and external partnerships could enhance bridging capital and long-term governance capacity. These strategies align with regional frameworks in Southeast Asia, which emphasize human capital investment and cooperative governance over infrastructure expansion (Adams et al., 2021; World Universities Network, 2023).

At the same time, the study acknowledges important limitations. The reliance on cross-sectional, self-reported data may introduce social desirability bias, particularly in evaluating leadership and preparedness. Correlation analysis, while statistically significant, does not imply causation; the observed relationships may be influenced by unmeasured factors such as municipal tourism policies or external NGO support. Furthermore, the geographic scope is limited to Pandin Lake, which

constrains generalizability to larger or more urbanized tourism hubs. Future research should employ longitudinal or mixed method designs to capture causal dynamics, explore lived experiences, and compare resilience patterns across other ecotourism destinations such as Bali, Vietnam, and the remaining lakes of San Pablo City.

Furthermore, the framework can also be tested in other destinations but with contextual adaptation and challenges. Community resilience–tourism frameworks have been successfully applied in very different destinations: rural heritage villages in Türkiye, Indonesian and Peruvian rural/marine communities, small islands, and indigenous tourism areas. Models linking community capitals, social capital, and resilience (e.g., “co flourishing”, social-ecological resilience, tourism community resilience models) are explicitly proposed for use across developing and developed destinations.

However, issues and challenges in applying the framework elsewhere may include: Place Based Specificity such as strong local culture, spirituality, or heritage (e.g., Balinese *niskala/sekala*, Andean *topophilia*, indigenous identities) shape how resilience works; frameworks cannot be copied without accounting for local meanings and institutions; Different Power Structures because some destinations are dominated by external investors or centralized states, which may limit genuine community control and resilience building ; Uneven Social Capital where bonding, bridging, and linking ties are weak, the mechanisms that worked in Pandin (collective action, NGO partnerships, community organizing) may not automatically function; Risk Profiles and Hazards pertaining to places facing frequent typhoons, earthquakes, or climate impacts have different resilience needs and trajectories from relatively less hazard exposed lakes and; Tourism Stage and Dependence or destinations with mass tourism, high dependence, or long term decline present different resilience dynamics than small, emerging ecotourism sites like Pandin.

Furthermore, this study advances the thesis that tourism, when rooted in cooperative social structures and cultural identity, provides the most significant foundation for community resilience. By situating Pandin Lake within both local and global contexts, the research contributes to the broader discourse on sustainable tourism. It offers a replicable framework for policymakers and practitioners seeking to balance rapid growth with long-term stability in small-scale ecotourism destinations.

Building on the findings of this study, several policy recommendations can be advanced to strengthen resilience in small-scale ecotourism destinations such as Pandin Lake. First, youth engagement should be prioritized to address the innovation gap identified in the demographic profile. Programs that integrate digital tourism, entrepreneurship training, and workshops on sustainable practices could incentivize younger generations to participate in the cooperative actively. This would ensure continuity of local knowledge while introducing new technologies and adaptive strategies.

Second, gender inclusivity must be embedded in cooperative governance. The current stratification of roles, with men dominating boat operations and women concentrated in hospitality, limits the potential for resilience. Evidence from Bali demonstrates that empowering women in leadership roles diversifies income streams and strengthens social bonds (Cole, 2012). Policies that promote female entrepreneurship, leadership training, and equitable role distribution would enhance both economic and social resilience.

Third, livelihood diversification is essential to reduce dependency on boat operations and mitigate the risks of economic monoculture. Comparative studies in Vietnam show that communities with diversified tourism and non-tourism activities recovered more quickly from pandemic disruptions (Adams et al., 2021). Pandin Lake could explore agro-tourism, handicrafts, and cultural performances as complementary income sources, thereby buffering against fluctuations in visitor demand.

Fourth, leadership development and external partnerships should be institutionalized. While community competence was rated highly, effective leadership scored lowest, suggesting a need for strategic capacity-building. Leadership training programs, combined with stronger partnerships with NGOs, government agencies, and academic institutions, would enhance bridging capital and ensure long-term governance capacity. This aligns with regional frameworks in Southeast Asia that emphasize cooperative governance and external linkages as critical to resilience (World Universities Network, 2023).

Finally, infrastructure development must be paired with human capacity-building. The non-significant relationship between physical structures and community competence underscores the “infrastructure paradox” (Fethi & Senyücel, 2021). Investments in accessibility and facilities should be complemented by disaster preparedness workshops, cooperative management training, and environmental stewardship programs to ensure that physical improvements translate into adaptive capacity.

With these recommendations, the study highlights that resilience in small-scale ecotourism destinations is best achieved through investments in human capital, inclusive governance, and diversified livelihoods, rather than solely in infrastructure. By situating Pandin Lake within broader Southeast Asian experiences, this study provides a replicable framework for policymakers and practitioners seeking to balance rapid tourism growth with sustainable, long-term community resilience.

References

- Adams, K. M., Choe, J., Mostafanezhad, M., & Phi, G. T. (2021). (Post-)pandemic tourism resilience: Southeast Asian lives and livelihoods in limbo. *Tourism Geographies*, 23(4), 915–936. DOI: 10.1080/14616688.2021.1916584.
- American Psychological Association. (2017). *Ethical principles of psychologists and code of conduct*. <https://www.apa.org/ethics/code>.
- Aydin, B., & Behram, N. K. (2022). Rural heritage tourism and community resilience: Adaptive approaches in Behramkale, Turkey. *Journal of Heritage Tourism*, 17(5), 467–484. DOI: 10.1080/1743873X.2021.1933605.
- Brillo, B. (2016). Development of a Small Lake: Ecotourism Enterprise for Pandin Lake, San Pablo City, Philippines. *Environmental Anthropology eJournal*.
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, 1(3), 185–216. DOI: 10.1177/135910457000100301 (doi.org in Bing).
- Clark, C., Nyaupane, G., & Xiao, X. (2024). Building community resilience and adaptive capacity through investments in tourism and conservation. *Journal of Travel Research*. DOI: 10.1177/00472875241304482.
- Cole, S. (2012). *Tourism, culture and development: Hopes, dreams and realities in Indonesia*. Channel View Publications.
- Creswell, J. W., & Creswell, J. D. (2022). *Research design: Qualitative, quantitative, and mixed methods approach* (6th ed.). SAGE Publications.

- Del Mundo, C., & Cárdenas, M. (2020). Community-based tourism and resilience in Lake Sebu, Philippines. *Asia Pacific Journal of Tourism Research*, 25(9), 1012–1028. DOI: 10.1080/10941665.2020.1818895.
- Fethi, S., & Senyücel, Z. (2021). Infrastructure paradox in tourism resilience. *Journal of Sustainable Tourism*, 29(7), 1123–1139.
- Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5th ed.). SAGE Publications.
- Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5th ed.). Sage.
- Gannon, M. J. (2020). *The role of tourism in community development: A structural approach*. *Journal of Sustainable Tourism*, 28(4), 512–530.
- Godovyk, O. (2025). Social cohesion and community-based tourism: A longitudinal study. *International Journal of Tourism Research*.
- Hu, H., Zhang, J., & Wang, C. (2023). Social capital, tourism dependence, and community resilience: A local perspective. *Tourism Management*, 92, 104535.
- James, P., & Putungan, G. (2023). Ecotourism, a social enterprise of the Pandin Lake Tourist Service Cooperative, Sto. Angel, San Pablo City, Laguna: Assessment and suggested tourism development plan. *Corporate Sustainable Management Journal*, 1(1), 15–18. DOI: 10.26480/csmj.01.2023.15.18.
- Magcale-Macandog, D. B., Paller, V. G. V., Pleto, J. V. R., et al. (2021). Socio-economic and environmental impacts of the COVID-19 pandemic: Building resilience of the Seven Lakes of San Pablo City, Philippines. In S. S. Ray & M. H. Chowdhury (Eds.), *Environmental resilience and transformation in times of COVID-19* (pp. 207–220). Elsevier. DOI: 10.1016/B978-0-323-85512-9.00012-7.
- Mohajan, H. K. (2020). Quantitative research: A successful investigation in natural and social sciences. *Journal of Economic Development, Environment and People*, 9(4), 50–79.
- Munoz, A., & Chapman, S. (2020). Gender, tourism and resilience: Exploring the links. *Annals of Tourism Research*, 83, 102956.
- Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience is a metaphor, a theory, a set of capacities, and a strategy for disaster readiness. *American Journal of Community Psychology*, 41(1–2), 127–150.
- Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience is a metaphor, a theory, a set of capacities, and a strategy for disaster readiness. *American Journal of Community Psychology*, 41(1–2), 127–150. DOI: 10.1007/s10464-007-9156-6.
- Nugroho, S. (2024). Innovation and social capital in community-based ecotourism. *Journal of Sustainable Development*, 16(1), 12–28.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.
- OECD. (2025). Building strong and resilient tourism destinations. *OECD Tourism Papers*, 2025/03. OECD Publishing. DOI: 10.1787/a57c343d-en.
- Perez, M. G. L., Macandog, D. M., Nacorda, H. M. E., Sanchez, P. A. J., Predo, C. D., & Settele, J. (2023). Estimating the recreational benefits of Lake Pandin as a tourism destination in San Pablo City, Laguna, Philippines. *Science and Engineering Global Journal*, 16(Supplement), 027–036. DOI: 10.54645/202316SupIUY-38.

- Pfefferbaum, R. L., Pfefferbaum, B., & Van Horn, R. L. (2016). Community resilience and the Communities Advancing Resilience Toolkit (CART). *Current Psychiatry Reports*, 18, 102. DOI: 10.1007/s11920-016-0739-1.
- Republic Act No. 10173. (2012). *Data Privacy Act of 2012*. Official Gazette of the Republic of the Philippines.
- Slater, T., & Hasson, F. (2024). *Quantitative methods for social sciences: A practical guide*. Routledge.
- Tejada, J. J., & Punzalan, J. R. B. (2012). On the misuse of Slovin's formula. *Philippine Statistician*, 61(1), 129–136.
- Tsao, C., & Ni, C. (2016). Vulnerability, resilience, and the adaptive cycle in a crisis-prone tourism community. *Tourism Geographies*, 18(1), 105–80. DOI: 10.1080/14616688.2015.1116600
- UrbanFootprint. (2024, July 11). *What is community resilience, and why does it matter?* <https://urbanfootprint.com/community-resilience-meaning/>.
- Voronkova, L., & Galbrait, A. (2023). Tourism and poverty alleviation: A metareview of empirical evidence. *World Development*, 162, 106092.
- Wakil, A., Sun, Y., & Chan, E. (2021). Co-flourishing: Intertwining community resilience and tourism development in destination communities. *Tourism Management Perspectives*, 38, 100803. DOI: 10.1016/j.tmp.2021.100803.
- Weaver, D. (2022). Tourism theory and the pandiscipline of tourism. *Journal of Travel Research*, 62, 259–265. DOI: 10.1177/00472875221095217.
- World Universities Network (WUN). (2023). *Southeast Asia: Pathways to resilience and sustainability in tourism*. Mahidol University Policy Roundtable.
- Yang, E., & Kim, J. (2023). Sustainable tourism development in a host community: The mediating role of community resilience in response to disasters and crises. *International Journal of Tourism Research*, 25(5), 527–541.
- Zander, K. K., Williams, A., & Naumann, T. (2023). Community resilience to natural hazards in Australia: Evidence from the CCRAM-10. *International Journal of Disaster Risk Reduction*, 91, 103693. DOI: 10.1016/j.ijdrr.2023.103693.
- Zhang, J., et al. (2023). Leadership and economic resilience in tourism-dependent communities. *Annals of Tourism Research*, 95, 103421.