
論文

RESEARCH ARTICLE

Polycentric Governance in Crisis: Analyzing Tourism MSE Adaptation and Environmental Sustainability Through the IAD Framework¹

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Abstract

This study employs the Institutional Analysis and Development (IAD) framework to examine the resilience and recovery strategies of tourism micro and small enterprises (MSEs) in the Philippines during the COVID-19 pandemic. Through comparative case studies of two eco-tourism destinations - Pagsanjan and Cavinti - the research investigates how institutional arrangements shaped MSE responses to unprecedented disruptions while maintaining commitments to environmental sustainability. Drawing on semi-structured interviews with 30 stakeholders and analysis of policy documents, the study reveals three critical elements of institutional resilience: flexible multi-level governance arrangements that enabled rapid adaptation of rules and practices; robust community attributes, particularly social capital and local leadership, that facilitated innovative collective responses; and effective coordination mechanisms among government agencies, businesses, and community groups that supported both immediate crisis management and longer-term sustainability goals. The findings advance theoretical understanding of how polycentric governance arrangements can help reconcile competing priorities during crisis periods, while also generating practical insights for enhancing the resilience of tourism-dependent communities. The study demonstrates that institutional frameworks maintaining focus on environmental stewardship through collaborative resource management initiatives can effectively balance recovery imperatives with sustainability objectives. These insights contribute to both scholarly discussions of institutional responses to crisis and practical approaches to building more resilient and sustainable tourism systems in developing country contexts.

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I. Introduction

The tourism sector in the Philippines has long been a vital component of the national economy, significantly contributing to employment and income generation. Micro and small enterprises (MSEs), comprising 99.5% of established businesses, serve as the backbone of rural tourism through local restaurants, tour operators, and accommodation providers, offering unique experiences that attract both domestic and international visitors (DTI, 2019). However, the COVID-19 pandemic has severely disrupted this landscape, leading to unprecedented challenges for MSEs. Lockdowns and travel restrictions resulted in a dramatic decline in tourist arrivals, with many businesses facing closure and significant revenue losses. A rapid survey conducted in 2020 (Shinozaki and Rao (2021)) revealed that around 70% of MSEs in the service sector ceased operations, underscoring the unprecedented challenges posed by the global pandemic.

In light of these challenges, this study aims to explore the resilience and recovery strategies of tourism MSEs in the Philippines during the COVID-19 pandemic. The primary research objectives are to identify the coping mechanisms employed by these enterprises, assess the effectiveness of institutional responses, and understand the long-term implications of the pandemic on their sustainability. Key research questions include: What strategies did MSEs implement to navigate the crisis? How did institutional frameworks influence their recovery efforts? What lessons can be learned to enhance the resilience of tourism MSEs in future crises?

To comprehensively examine these challenges, this study employs the Institutional Analysis and Development (IAD) framework to explore: a) specific strategies MSEs used to navigate the crisis; b) the impact of institutional frameworks on recovery efforts; and c) lessons for enhancing tourism MSE resilience in future global disruptions. The IAD framework allows for a comprehensive analysis of how policies and regulations shaped the resilience of tourism MSEs by examining institutional responses to the pandemic. It also facilitates the identification of key factors that contributed to successful recovery efforts, such as access to financial support, information dissemination, and community engagement. The framework's significance lies in its ability to highlight the interconnectedness of institutional arrangements and MSE behaviors, offering valuable insights for policymakers and practitioners.

The study focuses on two specific sites: Pagsanjan and Cavinti, both of which are renowned for their eco-tourism offerings. Pagsanjan, famous for its picturesque waterfalls and river tours, has historically attracted a significant number of tourists. In contrast, Cavinti is known for its natural landscapes and adventure activities, making it a popular destination for both local and international visitors. Beyond these ecological differences, the sites present compelling social contrasts that make them ideal for comparative analysis. Pagsanjan features a more established tourism industry with formalized associations creating strong but rigid institutional structures. The community has deeper historical involvement in tourism, with many families dependent on

the industry for multiple generations. Cavinti, meanwhile, has experienced more recent tourism development with greater diversity in its socioeconomic structure, including a significant agricultural base that continued to function during the pandemic. The selection of these sites allows for a comparative analysis of how these different social contexts influenced MSE adaptation strategies and institutional responses during the crisis, providing insights into the relationship between community attributes and crisis resilience.

II. Literature Review

The tourism sector, particularly micro and small enterprises (MSEs), faced unprecedented challenges during the COVID-19 pandemic. Understanding their resilience requires examining the institutional frameworks governing their operations. This review synthesizes existing research on institutional responses to tourism crises through the lens of the Institutional Analysis and Development (IAD) framework developed by Elinor Ostrom, as shown in Figure 1.

Applications of IAD to Tourism and Crisis Management

The application of the Institutional Analysis and Development (IAD) framework to tourism governance has emerged as a valuable analytical tool for understanding crisis management and resilience. This framework is particularly well-suited for analyzing tourism systems because tourism activities often involve complex resource management challenges that require coordinated action among diverse stakeholders.

Recent research demonstrates the framework's utility in analyzing community-based tourism initiatives. Heenehan et al. (2015) applied the IAD framework to examine collective action in tourism management, revealing how social capital and community attributes influence adaptive capacity. Their findings highlight the critical role of stakeholder collaboration and institutional learning in building resilient tourism systems. This perspective is particularly relevant when examining how tourism-dependent communities respond to external shocks such as natural disasters or economic downturns (Damayanti et al., 2019).

The framework's emphasis on rules-in-use provides valuable insights into institutional responses during crises. During the COVID-19 pandemic, governments implemented various emergency regulations and support measures, including financial aid and flexible operational guidelines. The effectiveness of these responses often depended on existing institutional arrangements and stakeholders' ability to navigate evolving regulatory environments (Ioannides & Gyimóthy, 2020).

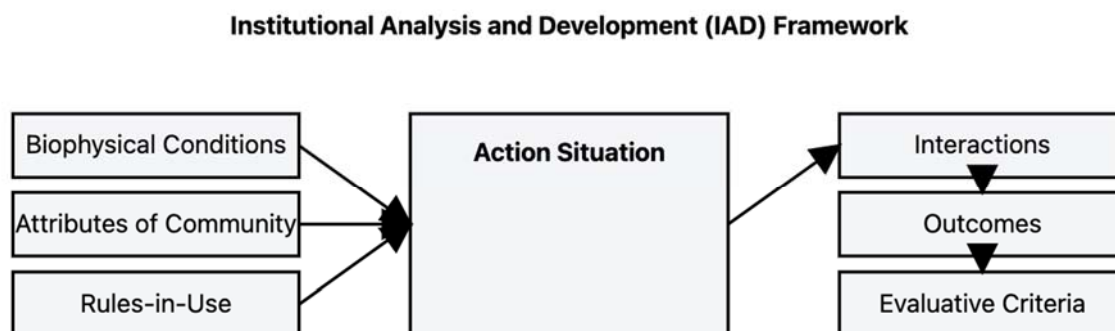


Figure 1. Ostrom's IAD Framework Components (Ostrom, 2005)

Biophysical Conditions and Resource Management

The availability and quality of tourism infrastructure significantly impacts MSE operations during crises. González et al. (2020) highlight how physical conditions, including natural attractions and built infrastructure, influence the adaptive capacity of tourism destinations. Their research demonstrates that destinations with diverse resource bases and well-maintained infrastructure demonstrate greater resilience to external shocks.

Tourism MSEs operate within complex action situations where multiple stakeholders make decisions affecting resource use and business operations. Research by Heenehan et al. (2015) demonstrates how local communities engage in tourism development through collective decision-making processes, particularly in managing common-pool resources like natural attractions. These action situations became especially critical during the pandemic, as MSEs had to navigate rapidly changing circumstances while maintaining sustainable practices.

Baker et al. (2020) further emphasize the importance of understanding how physical conditions interact with institutional arrangements to shape tourism outcomes. This interaction becomes particularly relevant when examining how MSEs adapt their operations while maintaining sustainable resource management practices during crises.

Community Attributes and Social Capital

Social capital and community networks play crucial roles in tourism resilience, particularly during crises. Aldrich & Meyer (2015) demonstrate how strong social networks facilitate resource sharing and knowledge transfer among tourism stakeholders. These community attributes become especially important when formal support systems are strained, enabling MSEs to access alternative resources and support mechanisms.

Research shows that communities with high levels of social cohesion and established networks tend to demonstrate greater adaptive capacity during crises (Mastrorillo et al., 2016).

These findings suggest that strengthening community bonds and social capital should be key components of tourism resilience strategies.

The effectiveness of institutional responses often depends on stakeholders' ability to coordinate within these action situations. Studies show that successful crisis management in tourism destinations requires clear communication channels and established decision-making processes (Schneider & Foot, 2020). This is particularly relevant when examining how MSEs adapt their operations during disruptions while maintaining commitment to sustainable resource management.

Institutional Rules and Polycentric Governance

Rules-in-use, encompassing both formal regulations and informal norms, significantly influence MSE resilience during crises. McGinnis (2011) emphasizes the importance of adaptive governance structures that can respond to changing circumstances while maintaining core operational principles. Research indicates that flexible regulatory frameworks allowing MSEs to modify their business practices while adhering to essential standards tend to enhance resilience (Bramwell & Lane, 2011).

The pandemic has highlighted the critical role of multilevel institutional arrangements in supporting tourism recovery. Studies demonstrate that effective crisis response requires coordination between local, regional, and national governance structures (Ioannides & Gyimóthy, 2020). This coordination becomes particularly important when implementing emergency measures while maintaining long-term sustainability goals.

Polycentric Governance and Tourism Resilience

Polycentric governance refers to institutional arrangements characterized by multiple centers of decision-making that are formally independent yet functionally interdependent (Ostrom, 2010). This approach is particularly relevant for tourism systems, which typically involve diverse stakeholders operating at different scales with overlapping jurisdictions. McGinnis and Ostrom (2014) argue that polycentric systems can better address complex problems by enabling responses tailored to specific local contexts while maintaining coordination across scales.

In tourism contexts, polycentricity manifests through various institutional arrangements including government agencies at multiple levels, industry associations, community organizations, and informal networks. Aligica and Tarko (2012) suggest that such institutional diversity can enhance system resilience by providing redundancy, fostering innovation, and facilitating context-specific responses. During crisis periods like the COVID-19 pandemic, polycentric systems may enable more flexible and adaptive responses than centralized governance approaches (Frey & Ostrom, 2020).

Synthesis and Research Gaps

While existing literature provides valuable insights into institutional factors affecting tourism resilience, several research gaps remain. First, there is limited understanding of how different institutional arrangements interact during crisis periods, particularly in developing country contexts. Second, more research is needed on the role of informal institutions in supporting MSE adaptation. Finally, studies examining the long-term implications of crisis-induced institutional changes on tourism sustainability are scarce.

This study addresses these gaps by examining how institutional arrangements shaped MSE responses to the COVID-19 pandemic in Philippine tourism destinations, contributing to both theoretical understanding and practical applications of the IAD framework in crisis management.

III. Theoretical Framework

The adapted IAD framework (Figure 2) provides a systematic analytical lens for examining the complex institutional dynamics that shaped micro and small tourism enterprise (MSE) responses to the COVID-19 pandemic. This framework reveals the multi-dimensional nature of institutional responses to the crisis through interconnected components that influence stakeholder behaviors and outcomes.

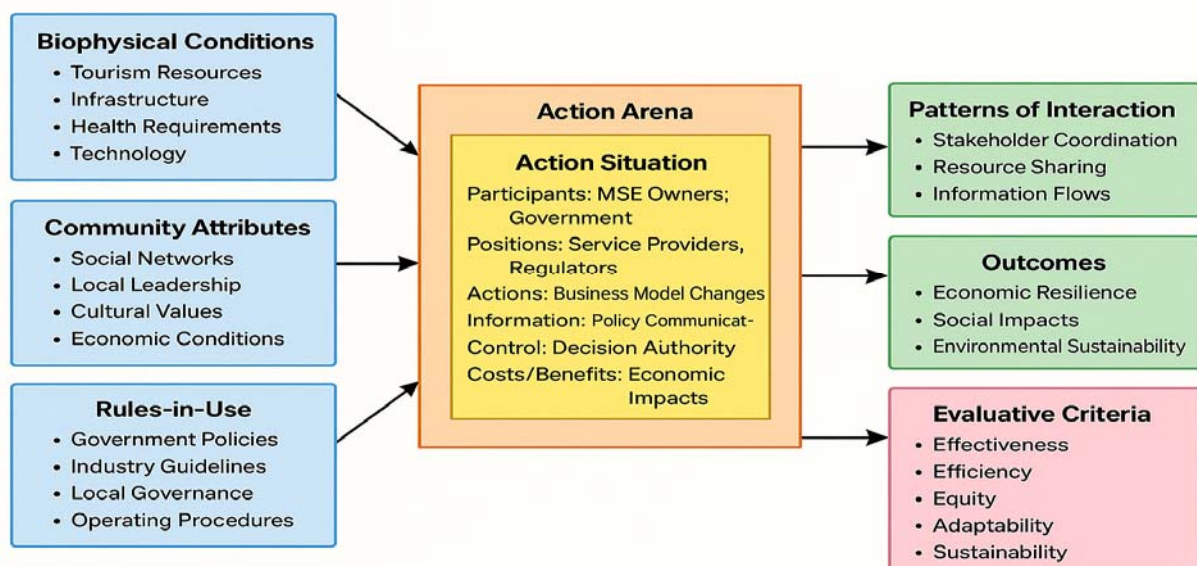


Figure 2. Adapted IAD Framework for Tourism MSE Analysis

Biophysical Conditions: Resource Systems and Context

The framework's foundational elements encompass the biophysical conditions that shape tourism activities in Pagsanjan and Cavinti. These destinations represent complex social-ecological systems where natural assets (waterfalls, rivers, caves) interact with built infrastructure to create distinct operational contexts for MSEs. During the pandemic, these resource systems faced unprecedented pressures as physical distancing requirements and health protocols introduced new constraints on resource utilization.

The natural assets of Pagsanjan and Cavinti, including the iconic Pagsanjan Falls, extensive river systems, and diverse landscapes, operate within distinct ecological carrying capacities that influence sustainable tourism development. These natural features are complemented by a network of built infrastructure—ranging from boat docking facilities and hiking trails to accommodation structures—that mediates visitor access and shapes tourism experiences. The spatial distribution of these resources creates unique patterns of tourism activity, with concentrated nodes of visitor engagement along river corridors and dispersed activities throughout the broader landscape.

Community and Stakeholder Dynamics

Community attributes emerged as critical determinants of collective adaptive capacity during the crisis, manifesting through complex networks of social relationships and institutional arrangements that shaped resource governance and tourism management. The interplay of social networks among tourism operators, anchored by local leadership structures and cultural values regarding cooperation, created distinctive patterns of response to pandemic-induced challenges.

These dynamics were particularly evident in knowledge-sharing mechanisms that facilitated rapid dissemination of critical information about health protocols and market conditions, while resource mobilization patterns reflected both formal institutional arrangements and informal social capital networks. The effectiveness of community responses depended heavily on the strength of these underlying social structures, with well-connected communities demonstrating enhanced ability to coordinate adaptation strategies while maintaining commitment to sustainable tourism practices.

Institutional Arrangements and Rules-in-Use

The governance of tourism resources operates through multilayered institutional arrangements that evolved significantly during the pandemic period. At the constitutional level, environmental regulations establish fundamental parameters for resource use, while operational rules govern day-to-day tourism activities. The crisis necessitated rapid adaptation of these arrangements, particularly in the development and implementation of health and safety protocols.

Local management systems, embedded within broader governance frameworks, played crucial roles in mediating between conservation requirements and tourism needs. These institutional structures demonstrated varying degrees of flexibility in responding to pandemic constraints, with some arrangements facilitating adaptive responses while others created barriers to innovation. The effectiveness of these institutional arrangements in supporting MSE resilience depended heavily on their ability to balance public health requirements with sustainable resource utilization, while maintaining the integrity of local ecological systems.

Action Arena Analysis

The action arena represents the critical interface where diverse stakeholders engage in strategic interactions shaped by institutional constraints and opportunities within the tourism-dependent social-ecological system. This dynamic space serves as the nexus where MSE owners, government agencies, tourism associations, and local communities coordinate responses to the COVID-19 crisis while navigating complex resource governance challenges. The framework enables analysis of both the structural positions of different actors and the information flows that shape their decision-making processes.

Participant Positions and Roles

The action arena is characterized by a complex web of interdependent stakeholder roles that collectively influence tourism governance and resource management outcomes. MSE owners occupy a central position as primary service providers, directly mediating visitor interactions with natural resources while implementing operational adaptations to meet evolving crisis requirements. Government agencies function as regulatory authorities, establishing and enforcing protocols that balance public health considerations with sustainable resource use. Tourism associations serve as crucial intermediaries, facilitating information exchange and coordinating collective responses to shared challenges. Community members play multiple roles as both resource users and environmental stewards, contributing local ecological knowledge while participating in conservation initiatives. These overlapping positions create dynamic patterns of interaction that influence both immediate crisis responses and longer-term sustainability outcomes.

Information Flows and Decision Making

The effectiveness of stakeholder responses to the pandemic has been significantly influenced by patterns of information flow and decision-making processes within the action arena. The distribution of control over resources—both natural and institutional—shapes the range of adaptive strategies available to different stakeholders. Communication channels, both formal

and informal, facilitate the exchange of critical information about health protocols, market conditions, and resource management strategies. Stakeholders must navigate complex cost-benefit considerations that balance immediate economic needs with longer-term sustainability goals, while developing adaptive strategies that respond to rapidly changing circumstances. These decision-making processes are embedded within broader institutional frameworks that either constrain or enable innovative responses to crisis conditions, ultimately influencing the resilience of the tourism-dependent social-ecological system.

Patterns and Outcomes Analysis

The framework's emphasis on patterns and outcomes provides crucial insights into how institutional arrangements shaped both immediate crisis responses and longer-term adaptation strategies in tourism-dependent communities. This analysis reveals the complex interplay between social, economic, and ecological dimensions of tourism resilience.

Interaction Patterns

The crisis catalyzed distinct patterns of stakeholder interaction that reflected both existing institutional arrangements and emerging adaptive strategies. These patterns manifested through:

- Communities developed novel approaches to sharing limited resources, including joint marketing initiatives and coordinated visitor management strategies.
- Formal and informal channels emerged for disseminating crucial updates about health protocols, market conditions, and support programs.
- Stakeholders established new decision-making processes that balanced immediate crisis response with longer-term sustainability goals.

Multidimensional Outcomes

The framework reveals how institutional responses generated interconnected outcomes across multiple dimensions:

- MSEs demonstrated varying degrees of adaptive capacity, influenced by their access to resources, information, and support networks.
- Crisis-induced changes in tourism patterns created both challenges and opportunities for sustainable resource management.
- Communities developed enhanced capabilities for collective action and crisis response through experiential learning and knowledge sharing.

These patterns and outcomes highlight the dynamic nature of tourism systems and their capacity for adaptation under severe constraints. The analysis demonstrates how institutional

arrangements can either enable or constrain sustainable recovery pathways, offering valuable insights for future crisis management strategies.

IV. Research Methods

This study employed a qualitative case study approach to examine how micro and small enterprises (MSEs) in eco-tourism sites navigated resilience and sustainability challenges during the COVID-19 pandemic. The research design was guided by the Institutional Analysis and Development (IAD) framework, which provides a systematic way to analyze how rules, physical/material conditions, and community attributes influence patterns of interactions and outcomes in action situations (Ostrom, 2011).

Study Sites Selection

Two municipalities in Laguna province - Pagsanjan and Cavinti - were purposively selected as case study sites based on three criteria: (1) presence of prominent eco-tourism attractions, particularly the Pagsanjan Falls and Cavinti Ecotourism Sites; (2) high concentration of tourism-related MSEs; and (3) accessibility from Metro Manila, allowing observation of domestic tourism dynamics during the pandemic. These sites represent interconnected eco-tourism destinations sharing natural resources while having distinct institutional arrangements for tourism governance.

Data Collection Methods

Primary data was collected through key informant interviews conducted between April-May 2023. Using purposive and snowball sampling, we interviewed 20 stakeholders equally distributed across both municipalities. Each site's sample included at least 7 MSE owners (accommodation providers, tour operators, and restaurant owners), and 3 local government officials (tourism office, environmental office, administrators' office).

We employed consistent interview protocols across both sites, asking participants about their specific location experiences and their understanding of broader regional dynamics. This approach enabled systematic comparison of site-specific challenges and cross-cutting issues affecting the tourism ecosystem. Secondary data including municipal tourism plans, ordinances, statistical reports, and policy documents were also gathered to triangulate findings and enable systematic comparison of institutional responses.

Interview Protocols and Implementation

We developed semi-structured interview protocols that systematically explored the key components of the IAD framework. The interview guides examined physical conditions through

questions about tourism resources and infrastructure; community attributes through discussions of social networks and cultural norms; rules-in-use by exploring both formal regulations and informal arrangements; action situations by focusing on key decisions during the pandemic; patterns of interaction through discussions of coordination mechanisms; and outcomes through questions about business performance and environmental impacts.

These interviews typically lasted between sixty to ninety minutes and were conducted in either Filipino or English according to the respondent's preference. With participants' informed consent, all interviews were audio-recorded and later transcribed verbatim to ensure accurate capture of responses. This rich qualitative data provided deep insights into how different stakeholders experienced and responded to pandemic challenges while attempting to maintain both business viability and environmental sustainability.

Data Analysis Using IAD Framework

The analysis of interview transcripts and secondary data was guided by the IAD framework's systematic approach to understanding institutional dynamics in social-ecological systems. This analytical process began by examining how the interplay of physical conditions, community attributes, and institutional rules shaped MSE responses to pandemic challenges. We investigated how COVID-19 restrictions intersected with existing tourism resources and infrastructure, while also considering how social capital networks and community norms influenced adaptive strategies. The role of both formal policies and informal institutional arrangements in constraining or enabling MSE adaptation was carefully examined.

The analysis then focused on understanding key action situations where stakeholders faced critical decisions during the pandemic period. This included examining how MSE owners navigated business operational choices regarding temporary closures or strategic pivoting of their services. We analyzed how stakeholders approached resource management decisions, particularly regarding environmental protection of shared natural attractions. The implementation of health protocols and distribution of support programs represented another crucial decision arena that required careful examination.

A deeper layer of analysis explored the patterns of interaction between various stakeholders in the tourism ecosystem. This involved mapping how information flowed between different actors, understanding mechanisms for resource allocation and access, examining compliance with and enforcement of new rules, and identifying how conflicts were resolved during the crisis period. These interaction patterns revealed important insights about the adaptive capacity of local tourism governance systems.

The final analytical focus centered on understanding outcomes across multiple dimensions. This included assessing MSE resilience and adaptation strategies, evaluating impacts on

environmental sustainability, examining social equity considerations, and identifying instances of institutional learning and innovation. Throughout the analysis, particular attention was paid to how different institutional arrangements either supported or hindered MSE adaptation while attempting to maintain environmental sustainability goals.

V. Results & Analysis

Biophysical Conditions

The physical and material conditions in Pagsanjan and Cavinti have played a significant role in shaping the local response to the COVID-19 crisis within the context of tourism and environmental sustainability. The tourism resources and infrastructure, such as the river, lake, and eco-parks, serve as the foundation for the local economy. However, the temporary closure of these resources during the pandemic, as noted by an interviewee from Pagsanjan who was part of the boatmen association, *"closed for two to three years during the pandemic,"* has posed significant economic constraints for the communities heavily dependent on tourism.

The pandemic exposed critical infrastructure vulnerabilities and dependencies in both sites. In Pagsanjan, the highly developed river tour infrastructure—including boat docking facilities, access paths, and visitor facilities—represented significant sunk investments that could not be easily repurposed. According to the municipal tourism officer, *'These specialized facilities became economic liabilities when tourism stopped, as they required maintenance but generated no revenue.'*

Meanwhile, less capital-intensive and more flexible infrastructure arrangements in some parts of Cavinti enabled quicker pivoting to alternative tourism models. A homestay owner explained how their property's agricultural connections became an asset: *'Our location near small organic farms allowed us to quickly develop farm-to-table experiences when conventional tourism declined. We created outdoor dining spaces and harvest experiences that met health protocols while providing new income streams.'*

The comparative analysis reveals how infrastructure integration with natural systems created different levels of adaptive capacity, with more flexible and diversified infrastructure arrangements supporting greater resilience during crisis periods.

Community Attributes and Adaptive Responses

The analysis reveals complex patterns of community organization and adaptation that emerged during the COVID-19 crisis, demonstrating the intricate relationships between social capital, institutional learning, and resource governance in tourism-dependent communities. These dynamics manifested through multiple interconnected mechanisms that shaped both immediate crisis responses and longer-term adaptation strategies.

Institutional Innovation and Social Capital

The emergence of formal community organizations played a crucial role in facilitating collective responses to crisis conditions. The Cavinti Women Weavers Association exemplifies how communities leveraged existing social networks to develop innovative adaptation strategies. Initially established as a cultural preservation initiative, the association evolved during the pandemic to serve multiple functions: maintaining traditional crafting knowledge, providing alternative livelihood opportunities, and creating new tourism products that aligned with health protocols. This institutional innovation demonstrates how communities can mobilize social capital to navigate complex challenges while maintaining cultural and environmental stewardship.

Business model adaptations have been a key feature of these interactions, as evidenced by the shift towards online platforms for marketing and service delivery. As restaurant owner noted, *"Food deliveries increased and after the pandemic still deliveries continue as major activities of restaurants and eateries."* This highlights the resilience and flexibility of local businesses in adjusting their operations to the changing circumstances. Additionally, the emergence of new tourism offerings, such as agriculture tourism, demonstrates the innovative capacity of the industry to diversify and tap into new market opportunities.

Resource Governance and Community Adaptation

Community responses to the crisis revealed sophisticated patterns of resource governance that balanced immediate economic needs with longer-term sustainability goals. Local tourism associations developed new protocols for managing shared natural resources, while informal networks facilitated knowledge sharing about adaptation strategies. Knowledge and capacity are essential attributes that enable communities to respond effectively to challenges. The case of Cavinti illustrates this, as the municipal administrator noted, *"original residents could share the knowledge of farming"* with newcomers who migrated from urban areas during the pandemic. This exchange of knowledge strengthens the community's capacity to adapt and innovate in the face of adversity.

Trust and reciprocity underpin the social fabric that enables communities to weather crises. The collaborative efforts between local government units, businesses, and residents in managing environmental resources like the river and lake demonstrate the importance of trust and mutual responsibility. As one resident noted, *"accommodations clean the lake or river in their vicinities,"* highlighting the reciprocal nature of environmental stewardship.

These governance arrangements demonstrated remarkable flexibility, allowing communities to maintain essential tourism services while adhering to public health requirements. The United

Boatmen Association of Pagsanjan, for instance, implemented modified river tour protocols that protected both visitor safety and ecological integrity.

Rules-in-Use During Crisis

The rules-in-use analysis reveals important adaptations and responses to the COVID-19 crisis across operational, collective choice, and constitutional levels in Pagsanjan and Cavinti's tourism and environmental management. At the operational level, changes included the temporary closure of tourist destinations and the shift of some residents to fishing for subsistence. These operational adaptations directly affected day-to-day activities but were implemented within existing rule structures.

Collective choice adaptations, which involve stakeholders modifying the rules that govern operational activities, were particularly significant in shaping resilience. According to Ostrom's IAD framework, collective choice processes determine how operational rules can be changed, who can participate in these decisions, and how these changes are implemented. In Pagsanjan, we observed several distinct examples of collective choice adaptation:

The United Boatmen Association of Pagsanjan (UBAP) initiated a formal process to establish new health protocols for river tours. A UBAP leader noted, "*We formed a special committee of boat operator representatives to create safety protocols tailored to our river conditions.*" This committee established rules to reduce boat capacity (from 3 to 1-2 tourists), implement mandatory disinfection after trips, and modify boarding to ensure physical distancing. Notably, these rules resulted from collaborative decision-making among resource users, exemplifying Ostrom's concept of user participation in rule modification—essential for effective collective choice processes. Municipal governments in both areas established mechanisms for tourism stakeholder involvement in decision-making. The Pagsanjan tourism officer indicated that "*we formed a multi-sectoral tourism recovery taskforce with formal voting and regular meetings, allowing MSE owners direct input on tourism reopening.*" This marked a significant adaptation by changing who participates in rule-making and the decision process for tourism resources.

Constitutional-level adaptations were evident in how governance authority was redistributed during the crisis. Local tourism associations gained greater authority to implement and monitor compliance with safety protocols, representing a shift in who could participate in decision-making processes.

Stakeholder Mapping and Action Situation Analysis

The study employed a comprehensive stakeholder mapping approach guided by the IAD framework's focus on understanding action arenas and institutional dynamics. Figure 3 shows the stakeholder map of the local tourism scene. Through initial scoping visits and consultations,

we identified and mapped key internal and external stakeholders involved in local tourism governance at the study sites. The internal stakeholder ecosystem comprised MSE owners and managers operating restaurants, accommodation facilities, and tour services, along with their employees, suppliers, and customer base. The external stakeholder landscape included local government units, particularly the municipal tourism and environment offices, tourism associations like the United Boatmen Association of Pagsanjan (UBAP), and various community groups.

This mapping exercise revealed several critical action situations where different stakeholders' interests and decisions intersected in important ways. A key arena involved MSE operational decisions regarding business continuity during the pandemic, where owners had to balance economic survival with health protocols while maintaining relationships with employees and suppliers. Another crucial action situation centered on tourism resource management and environmental protection, requiring coordination between MSEs, local government units, and community stakeholders to ensure sustainable use of natural attractions. The third major action arena involved policy implementation and support provision, where government agencies and tourism associations needed to develop and deploy assistance while MSEs had to navigate new regulatory requirements.

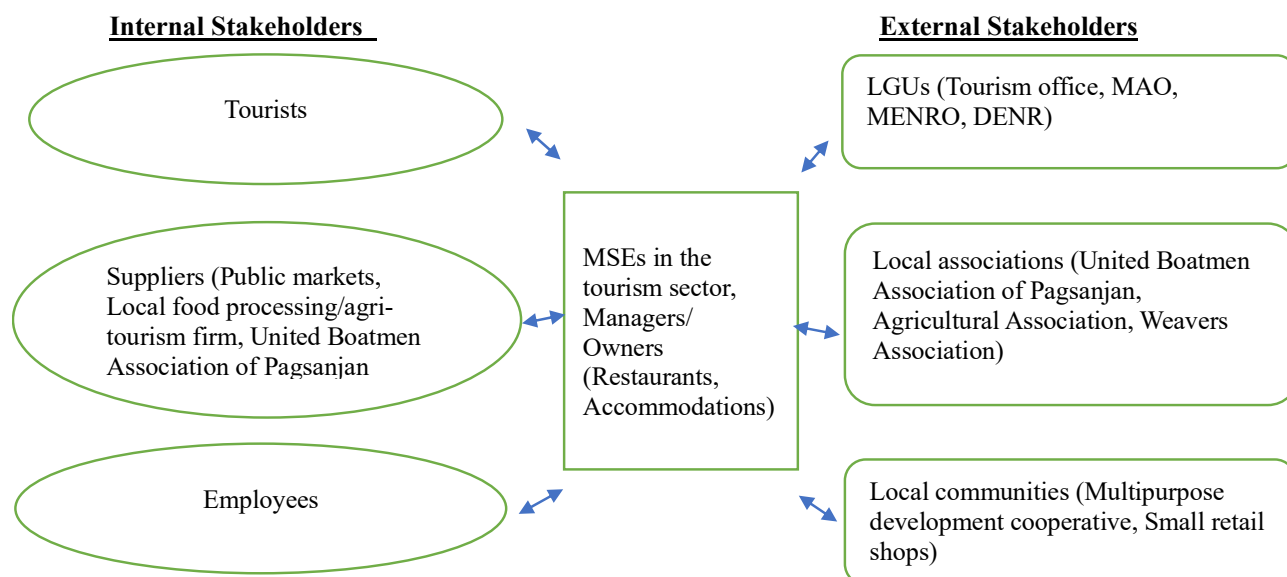


Figure 3. Stakeholder Map of Tourism Actors

Action Situation Analysis

The key participants in this action situation include government entities (LGUs), business operators, residents and barangays, and tourists. Each participant holds a specific position with

associated roles and responsibilities. For instance, LGUs are responsible for managing business permits, taxes, and environmental resources, while business operators provide various tourism services and products. Residents and barangays engage in activities such as river cleaning, fishing, and providing transportation services. Tourists, as consumers, pay for tours, products, and environmental fees.

The available actions for participants are guided by choice rules. As one business operator noted, *"Boat rides are strongly influenced by the weather."* This highlights how environmental conditions can constrain or enable certain actions. Information flows between participants through various channels, such as the creation of associations and government support for organic farming. One example is the *"Cavinti Women Weavers Association [which] was recreated to provide weaving products in order or to tourists."*

The costs and benefits associated with actions are governed by payoff rules. For instance, boat ride tours *"provide benefits to barangays, which handle cleaning of the river from time to time and bring tax revenue to tourism office and municipality."* However, as mentioned by an interviewee, *"the income from tourism is not enough to sustain living nowadays."*

Control over choices varies among participants. LGUs exercise control through regulations and interventions, such as *"solid waste management"* and *"supporting a tourism association."* Business operators and residents have control over their specific actions, but are influenced by external factors like tourist demand and environmental conditions. As one resident stated, *"Small organic farmers were selling vegetables directly to tourists along the tourist destinations."*

Patterns of Interaction

The COVID-19 pandemic catalyzed distinctive patterns of interaction among tourism stakeholders in Pagsanjan and Cavinti, revealing how institutional arrangements shape collective responses to crisis conditions. These interaction patterns manifested through multiple mechanisms, reflecting both existing institutional structures and emergent adaptive strategies. Our analysis identified several key patterns that significantly influenced crisis adaptation and sustainability outcomes.

Stakeholders in Pagsanjan and Cavinti adopted new collaborative mechanisms to manage scarce resources and safeguard public health. Previously competitive actors, such as boat operators and accommodation providers, introduced rotation and referral systems to distribute limited customers more equitably, and also created shared communication platforms to exchange real-time updates. These cooperative approaches balanced safety protocols with economic needs, fostering trust and collective action amid the crisis.

Systemic learning mechanisms emerged to gather insights from frontline experience and disseminate successful strategies across the tourism sector. "Lessons learned" documentation

and informal knowledge-sharing sessions helped stakeholders rapidly refine operational procedures and adopt innovative models, such as outdoor dining or flexible booking systems. Collectively, these developments fostered more resilient institutional arrangements that combined equitable distribution, open communication, and continuous adaptation in response to rapidly evolving conditions.

Multidimensional Outcomes

The outcomes of the COVID-19 crisis in Pagsanjan and Cavinti have been multifaceted, encompassing economic, social, environmental, and institutional dimensions. From an economic perspective, the temporary closure of tourist destinations and the consequent loss of income have had significant impacts on the local communities heavily reliant on tourism. However, this was addressed through the diversification of tourism products, the development of alternative revenue streams, and the maintenance of critical supply chain relationships.

The social effects of the crisis have been evident in the adaptations and coping mechanisms employed by the local communities. The strengthened community networks and enhanced knowledge-sharing mechanisms were the typical responses.

From an environmental standpoint, the crisis has brought to the fore the intricate linkages between tourism, resource management, and conservation. The increased waste generation during and after the pandemic, as noted by an interviewee, *"more waste during and after pandemic,"* underscores the need for sustainable waste management practices and infrastructure.

Institutional learning has been a critical outcome of the crisis, as evidenced by the adaptive responses and innovative strategies employed by various stakeholders. The emergence of agriculture tourism and the adoption of online platforms for marketing and service delivery demonstrate the capacity of local institutions to learn from the crisis and seize new opportunities. Moreover, the government interventions in supporting local livelihoods and managing environmental resources underscore the crucial role of public institutions in building resilience and sustainability.

VI. Discussion

The analysis of tourism MSE resilience in Pagsanjan and Cavinti through the IAD framework reveals important theoretical insights and governance implications that advance our understanding of institutional responses to crisis situations. The findings contribute to both theoretical development and practical applications of polycentric governance in tourism-dependent social-ecological systems.

Drawing directly from our empirical analysis, the study reveals three critical institutional arrangements that influenced tourism sector resilience during the COVID-19 crisis through multi-level governance mechanisms:

1. **Adaptive Rules-in-Use Across Governance Levels:** Our analysis of operational, collective choice, and constitutional adaptations demonstrates how flexible and responsive rules enabled rapid adjustment to changing circumstances. As evidenced in the Rules-in-Use section, the United Boatmen Association of Pagsanjan established new health protocols that modified operational practices while maintaining essential services. The tourism recovery taskforce created by municipal governments, with formal voting procedures and direct MSE participation, exemplifies how collective choice processes evolved to become more inclusive during crisis. These examples align with McGinnis and Ostrom's (2014) emphasis on the importance of rules-in-use evolving to meet emerging challenges. Our findings show how temporary closure policies were complemented by financial assistance programs and regulatory adjustments that provided essential support while maintaining environmental safeguards - demonstrating what Clement (2010) describes as "politicized" institutional arrangements that balance multiple stakeholder interests.
2. **Robust Community Attributes:** The Community Attributes and Adaptive Responses section reveals how social capital, effective leadership, and knowledge-sharing networks fostered innovative responses to challenges. The Cavinti Women Weavers Association exemplifies how communities leveraged existing social networks to develop alternative livelihood opportunities during tourism disruption. Similarly, our findings on resource governance show how local knowledge facilitated adaptation, with original residents sharing farming expertise with urban migrants, as reported by the municipal administrator. These examples support Anderies et al.'s (2004) argument that social capital is crucial for institutional resilience in social-ecological systems. The Patterns of Interaction analysis further demonstrates how previously competitive businesses developed collaborative distribution mechanisms and knowledge-sharing forums that enhanced collective resilience during the crisis.
3. **Multi-Stakeholder Coordination:** Our Stakeholder Mapping and Action Situation Analysis identified crucial coordination mechanisms among government agencies, businesses, and community groups that created adaptive governance networks responding to both immediate challenges and longer-term sustainability concerns. The stakeholder map (Figure 3) illustrates the complex web of actors whose interactions shaped crisis responses. The Patterns of Interaction section documents how multi-directional information flows replaced previously hierarchical communication

structures, with platforms like regular online briefings bringing together health officials, tourism officers, and business representatives. This polycentric arrangement allowed different actors to contribute their unique capabilities while maintaining necessary checks and balances, as evidenced by joint resource management initiatives described in the Multidimensional Outcomes section.

The findings extend our theoretical understanding of polycentric governance by revealing specific mechanisms through which multiple centers of decision-making facilitate adaptive responses during crisis periods. By documenting the evolution of rules-in-use across different levels, the mobilization of community attributes, and the development of new coordination platforms, this study provides empirical evidence for how polycentric arrangements can enhance resilience in social-ecological systems facing unprecedented disruption.

Role of Polycentric Governance

The study underscores the critical role of polycentric governance in fostering resilience and sustainability amid crisis, supporting McGinnis' (2011) theoretical framework of adjacent action situations. The dynamic interplay between formal government interventions and informal community-based responses exemplifies what Agrawal (2003) identifies as key elements of sustainable governance particularly the importance of multiple centers of decision making.

The establishment and activation of diverse associations aligns with Heikkila and Cairney's (2018) emphasis on institutional diversity in policy implementation. These grassroots organizations played vital roles in mobilizing resources and fostering social cohesion - demonstrating what DeCaro et al. (2017) describe as the emergence of adaptive governance in response to crisis conditions.

Theoretical Advances to the IAD Framework

The study makes several important theoretical contributions that extend our understanding of institutional analysis:

1. The research demonstrates how rules-in-use adapt during crisis situations through the interaction of formal and informal institutions. This extends the IAD framework by highlighting the importance of institutional flexibility and the mechanisms through which rules evolve in response to external shocks.
2. The findings emphasize how community characteristics like social capital and leadership capabilities influence the effectiveness of institutional arrangements. This suggests the need to more explicitly incorporate these factors into institutional analysis, particularly when examining crisis response capacities.

3. The study reveals specific mechanisms through which polycentric governance operates in practice, including:

- Vertical integration between government levels
- Horizontal coordination among community organizations
- Hybrid arrangements combining formal and informal institutions
- Knowledge-sharing networks that facilitate learning and adaptation

These insights extend beyond traditional applications of the IAD framework by demonstrating how different governance levels interact during crisis situations to produce both intended and emergent outcomes.

Balancing Recovery with Sustainability

The analysis also reveals important tensions between immediate recovery needs and longer-term sustainability goals. This supports what Anderies and Janssen (2013) identify as key challenges in social-ecological systems - particularly around maintaining system identity while adapting to change. It demonstrates how institutional arrangements can help balance these competing priorities through:

1. Resource management practices that maintain environmental quality while supporting economic recovery
2. Innovation in tourism products and services that align with both market demands and sustainability objectives
3. Capacity-building initiatives that enhance community resilience while preserving cultural and natural heritage

This integrated perspective on recovery and sustainability represents an important theoretical contribution by showing how institutional arrangements can help reconcile apparently competing objectives in tourism-dependent communities.

VII. Conclusion

This study employed the Institutional Analysis and Development (IAD) framework to examine how tourism micro and small enterprises (MSEs) in Pagsanjan and Cavinti, Philippines demonstrated resilience during the COVID-19 pandemic. Through analysis of institutional arrangements, stakeholder behaviors, and social-ecological outcomes, the research revealed important insights about crisis adaptation in tourism-dependent communities.

The findings highlight three critical elements of institutional resilience. First, the presence of flexible, multi-level governance arrangements - spanning operational, collective choice, and constitutional levels - enabled communities to rapidly adapt rules and practices as circumstances evolved. Second, robust community attributes, particularly social capital and local leadership,

facilitated innovative collective responses including the formation of new associations and knowledge-sharing networks. Third, effective coordination mechanisms among government agencies, businesses, and community groups supported both immediate crisis management and longer-term sustainability goals.

A key theoretical contribution emerges in understanding how polycentric governance arrangements can help reconcile competing priorities during crisis periods. While the pandemic's economic impacts necessitated rapid response measures, the institutional frameworks in both municipalities maintained focus on environmental stewardship through collaborative resource management initiatives. The emergence of alternative livelihoods like agricultural tourism demonstrated how institutional innovation could support both recovery and sustainability objectives.

Study Limitations Future Research Directions

Several limitations should be considered when interpreting these findings. The focus on two municipalities, while allowing for detailed analysis, may limit broader generalizability. The qualitative methodology, while providing rich insights into institutional processes, captured perspectives from a limited number of stakeholders. Additionally, the cross-sectional design offers only a snapshot of crisis response rather than longer-term adaptation patterns.

These limitations suggest valuable directions for future research, including:

- Comparative analyses across multiple tourism destinations to identify common institutional success factors
- Longitudinal studies examining how governance arrangements evolve through different crisis phases
- Quantitative assessments of specific policy interventions' effectiveness
- Investigation of how digital technologies can enhance institutional coordination and adaptation

Policy Recommendations

Based on the study's findings, several policy recommendations emerge to enhance the resilience and sustainability of tourism MSEs in the face of future crises:

1. Strengthen multi-level governance frameworks that can facilitate rapid yet sustainable responses;
2. Invest in community capacity-building to enhance collective action capabilities;
3. Develop integrated approaches to environmental and economic resilience; and
4. Support technological innovation while maintaining focus on community wellbeing.

By implementing these recommendations and leveraging insights from the IAD framework, policymakers and practitioners can cultivate more resilient and sustainable tourism systems, better equipped to navigate the challenges posed by global crises like the COVID-19 pandemic.

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