INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH FOR INNOVATION, SUSTAINABILITY AND EXCELLENCE (IMJRISE)
Online ISSN: 3028-032X | Print ISSN: 3028-0370
PUBLISHED BY: RISEJOURNALS.ORG
Volume 2, Issue no. 8 | **87**

Lived Realities of Coastal Fishing Communities in Negros Island: A Mixed Methods Study

DOI: 10.5281/zenodo.16900366

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Abstract:

This study employed a sequential exploratory mixed-methods design to examine the livelihood realities of small-scale fisherfolk in the coastal barangays of Tuyom, Linaon, Caliling, and Isio in the Municipality of Cauayan, Negros Occidental. The qualitative phase explored the lived experiences, adaptation strategies, and challenges faced by fisherfolk through in-depth interviews with eight purposively selected conversation partners. Thematic analysis (Braun & Clarke, 2006) revealed five major themes: adaptation strategies, resilience, socioeconomic challenges, marketing dynamics, and environmental and ecological considerations. These themes informed the development of a structured survey administered to 104 fisherfolk for the quantitative phase. Findings from the survey confirmed that fisherfolk generally demonstrate moderate to very great levels of adaptation, resilience, and environmental awareness. However, they also face significant socioeconomic difficulties, particularly in relation to financial constraints and perceived burdens from government policies. The study highlighted variations in livelihood conditions based on age, educational attainment, income, and alternative livelihood sources. It concludes that while small-scale fisherfolk are resourceful and resilient, they remain vulnerable due to limited institutional support, policy misalignment, and fluctuating market access. The study recommends the development of localized, participatory, and integrated livelihood programs that build on existing fisherfolk capacities while addressing structural limitations. Greater financial inclusion, cooperative strengthening, and responsive fisheries governance are necessary to sustain small-scale fishing communities in an increasingly vulnerable socio-ecological context.

Keywords: small-scale fisherfolk, livelihood, adaptation strategies, resilience, socioeconomic challenges, marketing dynamics, environmental sustainability, mixed-methods, Negros Occidental, Philippines.

Introduction:

Fisherfolk communities in the Philippines represent one of the most socioeconomically vulnerable sectors in the country. According to the Philippine Statistics Authority (PSA, 2023), fishermen and women continue to register the highest poverty incidence among all major sectors, with 27.4% living below the national poverty threshold. Despite the archipelagic nature of the country and its reliance on marine resources, fisherfolk remain marginalized in terms of access to income, services, infrastructure, and decision-making processes. This paradox lies at the heart of a growing concern about livelihood insecurity, not just for environmental reasons but due to persistent structural and social inequities.

Small-scale fisheries, which employ the vast majority of fisherfolk in the Philippines, are critical to national food security and rural development. These fisheries contribute approximately half of the total marine fish production (BFAR, 2022), yet small-scale fishers often operate under precarious conditions. Characterized by low levels of capital, manual fishing methods, and limited access to markets, the livelihoods of these communities are frequently undermined by volatile catch volumes, erratic incomes, and the lack of institutional support (Chakraborty & Dhawan, 2025; Pomeroy et al., 2020; Pomeroy et al., 2001). In addition, their economic activities are highly dependent on natural factors and increasingly impacted by climate-related changes.

Livelihood, in this context, goes beyond mere economic survival. The term, as conceptualized by Chambers and Conway (1991), refers to the capabilities, assets, and activities required for a means of living. A livelihood is considered sustainable when it can cope with and recover from stress and shocks, maintain or enhance capabilities and assets, and provide sustainable livelihood opportunities for the next generation. For fisherfolk, this sustainability is often fragile—threatened by both environmental risks and socio-political neglect. Hence, examining the

complexities of their livelihood challenges requires a multidimensional lens, encompassing economic, environmental, and governance-related factors.

Among the most pressing concerns is the overexploitation of marine resources. Studies have reported that many nearshore fishing grounds in the Philippines are overfished, with declining fish stocks and biodiversity (Muallil et al., 2014). For small-scale fisherfolk, this results in longer trips, reduced catch, and increased operational costs. Overfishing is compounded by destructive fishing methods, pollution, and weak law enforcement, especially in areas adjacent to urban centers. Coastal barangays face the added burden of waste management problems, industrial runoff, and port-related developments that degrade nearshore habitats (EMB Region VI, 2021).

Moreover, climate change poses a mounting threat to the viability of fishing-based livelihoods. Rising sea levels, stronger typhoons, unpredictable weather patterns, and coral bleaching events are affecting fishery resources and fishing activities (Barbier, 2015; Garai, 2014) Many fisherfolk report seasonal unpredictability and unsafe sea conditions that further exacerbate livelihood risks. This climate vulnerability is heightened in informal coastal settlements, where housing is substandard, social protection is limited, and access to alternative income sources is scarce (ADB, 2024). These conditions call for targeted research and policy responses tailored to the lived realities of coastal communities.

Social and economic exclusion is another dimension of the fisherfolks' struggle. Access to capital, credit, insurance, and livelihood diversification opportunities remains limited for many small-scale fishers, particularly those without formal membership in associations or cooperatives (Kusakabe et al., 2022). Gender inequality also persists, as women in fisherfolk households—who are typically involved in fish processing, selling, or household finance—remain underrepresented in programs and policies. The Philippine Fisheries Code (RA 8550, 1998) and its amendments encourage community-based resource management, but implementation gaps and inconsistent support often hinder progress on the ground (Baco & Baco, 2022; Catedrilla et al., 2012).

Livelihood programs provided by the government and non-government actors, while well-intentioned, have been criticized for being piecemeal, short-term, or poorly targeted. Some interventions focus only on technical skills or equipment provision without addressing underlying issues like market access, value chains, or adaptive capacity (Pomeroy et al., 2017; Tolentino-Zondervan & Zondervan, 2022). In areas like the coastal villages of Cauayan, Negros Occidental, where the fisherfolk population contends with both ecological degradation and urban encroachment, the effectiveness of these programs is unclear. Understanding the lived experiences and perceptions of the fisherfolk is crucial for identifying mismatches between policy and practice.

In the broader discourse on development, there has been a growing shift from needs-based to rights-based approaches, advocating for the participation and empowerment of marginalized communities. Fisherfolk are not merely recipients of aid but are resource managers, knowledge holders, and stakeholders in coastal governance (Allison & Horemans, 2006). Yet their voices are often excluded from formal decision-making processes that affect their livelihoods. This exclusion perpetuates a cycle of dependency and reinforces the structural barriers that sustain poverty among coastal populations.

Against this backdrop, there is a need for localized, evidence-based research that captures the multifaceted nature of fisherfolk livelihoods. The coastal barangays in the Municipality of Cauayan, Negros Occidental, present a unique case study. It exemplifies how urban pressures, environmental degradation, and livelihood insecurity intersect in a coastal community. By focusing on this barangay, the study seeks to foreground the everyday challenges that fisherfolk face—from economic instability and resource depletion to policy gaps and climate exposure.

This study employed a sequential exploratory mixed-methods design to examine the multifaceted livelihood realities of small-scale fisherfolk in selected coastal barangays—Tuyom, Linaon, Caliling, and Isio—located in the Municipality of Cauayan, Negros Occidental. The research was conducted in two distinct but interconnected phases: a qualitative phase that aimed to gain deep contextual insights into the experiences of fisherfolk, followed by a quantitative phase designed to measure and validate the extent of key issues that emerged during the initial exploration.

In the qualitative phase, the study focused on exploring the lived experiences of members of fisherfolk associations, seeking to understand the specific challenges they face in sustaining their fishing-based livelihoods. It delved into

their everyday realities, including their struggles with poverty, environmental pressures, and limited access to resources and opportunities. Additionally, the study sought to examine their entrepreneurial aspirations, economic activities beyond fishing, and the social and ecological factors that influence their resilience. Through in-depth engagement, the qualitative phase aimed to uncover rich narratives that could inform the structure and focus of the succeeding survey instrument used in the quantitative phase.

Drawing from the themes generated in the qualitative stage, the quantitative phase of the study aimed to measure the prevalence and degree of key livelihood-related dimensions among small-scale fisherfolk. It sought to determine the extent to which fisherfolk practiced adaptation strategies—particularly in terms of their use of traditional and modern fishing methods, their work ethic, and their commitment to fishing—both at the collective level and when disaggregated by demographic characteristics such as age, educational attainment, years of fishing experience, income level, and presence of alternative livelihood sources.

The study also assessed the resilience of fisherfolk communities by measuring their levels of community-based resilience and resource management strategies. Moreover, it evaluated the magnitude of socioeconomic challenges, especially in relation to government policies and financial constraints, and investigated how these challenges differed across demographic groupings.

In addition, the research examined marketing dynamics by exploring fisherfolk's sales performance and understanding of market systems—factors that are often overlooked in small-scale fisheries research but are critical to income generation. Finally, the study analyzed how environmental and ecological considerations are integrated into their livelihood practices, focusing on their adherence to sustainable fishing practices and spatial awareness in resource use.

Methodology:

This study employed a sequential exploratory mixed-methods research design, which involved an initial qualitative phase followed by a quantitative phase, to comprehensively investigate the livelihood realities, adaptation strategies, and challenges faced by small-scale fisherfolk in selected coastal barangays—Tuyom, Linaon, Caliling, and Isio—located in the Municipality of Cauayan, Negros Occidental. The design was chosen to enable a deeper understanding of the fisherfolk's lived experiences before constructing a quantitative instrument that could validate and measure the extent of these realities across a broader sample (Creswell & Plano Clark, 2018).

The qualitative phase was exploratory in nature and focused on eliciting detailed narratives from members of the local fisherfolk association. Through interviews, the researcher sought to capture firsthand accounts of livelihood practices, perceptions of risk, challenges in daily fishing operations, and interactions with support systems. This phase allowed the identification of emergent themes related to socioeconomic vulnerability, adaptive practices, and institutional gaps—critical inputs that informed the design of the survey instrument used in the subsequent quantitative phase. Thematic analysis was employed following Braun and Clarke's (2006) six-step process, including familiarization, coding, theme development, and interpretation.

Guided by the insights generated from the qualitative stage, the quantitative phase adopted a descriptive survey design, which is appropriate when the goal is to systematically document and quantify the characteristics, conditions, and behaviors of a specific population (Creswell & Creswell, 2017). This phase aimed to measure the extent of fisherfolks' adaptation strategies, resilience capacities, livelihood challenges, market participation, and environmental considerations.

The study locale was Barangay Banago, an urban coastal barangay in Bacolod City, Negros Occidental, Philippines. This area is home to a significant number of small-scale fisherfolk who depend on nearshore fishing for their primary source of income. Its location presents a compelling case of urban-ecological interface, where issues of environmental degradation, economic marginalization, and climate vulnerability converge. The setting was intentionally selected to highlight the intersection of socio-environmental stressors that affect the fisherfolk's capacity to sustain their livelihoods.

A purposive sampling technique was employed to select respondents who were actively involved in fishing-related activities. This non-probability sampling method was deemed appropriate for its ability to provide rich, relevant, and context-specific data, particularly in community-based and exploratory research (Palinkas et al., 2013). The final sample consisted of 103 fisherfolk, with inclusion criteria focusing on individuals who were either heads of households or engaged in fishing, fish processing, or vending.

Data collection was facilitated through a researcher-made survey questionnaire, which was directly shaped by the qualitative findings. The instrument included both closed-ended and open-ended questions and was structured into three main parts: (1) demographic profile, (2) perceived livelihood challenges, and (3) coping mechanisms and support systems. The closed-ended sections enabled statistical analysis, while open-ended prompts allowed for nuanced elaboration and qualitative triangulation.

To ensure content validity and reliability, the instrument was subjected to expert validation by three faculty members with specialization in community development and research methodologies. Their feedback was incorporated to enhance clarity, relevance, and alignment with the study objectives. A pilot test was conducted with five fisherfolk from a nearby barangay not included in the main study. The internal consistency of the questionnaire was established using Cronbach's alpha, which yielded a score of 0.81, indicating an acceptable level of reliability for the instrument (Taber, 2018).

Data gathering took place over two weeks in March 2024. The researcher coordinated with barangay officials and leaders of fisherfolk associations to facilitate participant engagement. Surveys were administered in person with the assistance of trained data collectors. To accommodate participants with low literacy levels, questions were translated into Hiligaynon, the local dialect, and read aloud as necessary. Responses were recorded manually, checked for completeness, and later encoded for analysis.

Quantitative data were analyzed using descriptive statistics via Microsoft Excel and SPSS. Frequencies and percentages were computed for demographic variables and key livelihood challenges. Mean scores and standard deviations were used to evaluate the extent of adaptation strategies, resilience capacities, and perceived constraints. Results were further disaggregated according to demographic variables such as age, educational attainment, fishing experience, income level, and alternative sources of livelihood. Meanwhile, qualitative responses embedded in the survey were thematically coded to support and contextualize the quantitative findings.

This study adhered to standard ethical research protocols. Prior to data collection, informed consent was obtained from all participants, who were made aware of the study's objectives, the voluntary nature of their participation, the confidentiality of their responses, and their right to withdraw at any point without consequence. No personally identifiable information was collected. The researcher obtained formal permission from barangay authorities and complied with the ethical guidelines for community-based research as outlined by the Philippine Social Science Council (PSSC, 2020).

Results:

As the initial phase of this sequential exploratory mixed-methods study, the qualitative component aimed to explore the lived experiences, challenges, and aspirations of small-scale fisherfolk in the coastal barangays of Tuyom, Linaon, Caliling, and Isio, Municipality of Cauayan, Negros Occidental. Eight purposively selected conversation partners reflected diverse fishing profiles—from traditional to technologically aided methods—offering rich insights into rural coastal livelihoods. Data were collected through in-depth, semi-structured interviews and analyzed using Braun and Clarke's (2006) six-step thematic analysis, producing five major themes that later informed the quantitative survey.

Theme 1: Adaptation Strategies

The findings revealed that fisherfolk across the barangays of Tuyom, Linaon, Caliling, and Isio engage in a diverse range of adaptation strategies to maintain their fishing livelihoods amid environmental and socioeconomic challenges. These strategies revolve around two primary sub-themes: the integration of traditional and modern fishing methods, and the demonstration of strong work ethic and commitment to the fishing profession.

Under the sub-theme of Traditional and Modern Fishing Methods, respondents shared their use of time-honored techniques such as hook-and-line, gillnets, seine nets, and manually operated gear, reflecting deeply rooted cultural

practices and cost-effectiveness. At the same time, many are increasingly adopting modern tools and innovations, such as battery-powered lighting, synthetic nets, and in some cases, fish finders and motorized boats. These adaptations enable fishers to improve catch efficiency, cope with declining fish stocks, and navigate changing marine conditions. The hybridization of traditional and modern methods illustrates how fishers strive to balance ecological knowledge, technological access, and practical constraints in their daily livelihood activities.

The second sub-theme, Work Ethics and Commitment to Fishing, highlights the deeply ingrained values of resilience, perseverance, and community-oriented labor within fishing communities. Despite unpredictable income, physical hardship, and environmental uncertainty, fisherfolk consistently exhibit dedication to their trade. Their commitment is seen in their daily routines, ingenuity in modifying gear with limited resources, and willingness to share responsibilities and catch with others. The practice of feeding helpers, allocating resources for communal work, and continuing to fish even when yields are low demonstrates not only survival strategies but also cultural expressions of identity and pride in their vocation. These behaviors are closely tied to intergenerational knowledge transfer and are sustained by strong social norms and a collective sense of responsibility.

Theme 2: Resilience

The data revealed that fisherfolk in the coastal barangays of Tuyom, Linaon, Caliling, and Isio demonstrate a notable degree of resilience as they navigate the complex and interwoven challenges of environmental degradation, livelihood instability, and socioeconomic constraints. Their resilience is expressed through adaptive community behaviors, collective resource strategies, and pragmatic responses to daily survival needs. This theme is categorized into two sub-themes: Community Resilience and Resource Management Strategies.

Community resilience in these fishing communities is characterized by strong familial and social interdependence, adaptive economic practices, and culturally rooted values of cooperation. Families primarily rely on fishing as their sole source of income, making their survival heavily dependent on regular access to marine resources. Despite the unpredictable nature of fishing income and the increasing costs of operations—such as bait, equipment, and labor—fisherfolk continue to sustain their livelihoods through mutual assistance and a collective approach to work. Their ability to coordinate roles in fishing trips, share resources, and provide for one another in times of need demonstrates the embedded nature of resilience within the community. Furthermore, their ability to improvise with alternative food sources and local inputs underscores a culture of adaptive survival under economic pressure.

Resource management among the fisherfolk is largely driven by practical ingenuity, environmental awareness, and a circular approach to materials use. Fisherfolk frequently utilize locally available and low-cost materials—such as bamboo, used rubber tires, nylon, and old fishing net components—to craft or repair fishing equipment. This process includes the fabrication of fish traps and bait devices, often involving labor-intensive but cost-effective methods. Instead of discarding broken gear, they repair and reinforce damaged parts using recyclable items, often working with local craftsmen or community members who specialize in equipment maintenance. This not only reduces waste and cost but also strengthens local knowledge networks.

Fishers also exhibit an understanding of ecological behavior by selecting bait based on fish size and species, ensuring sustainable and effective catch practices. Lighting techniques are used strategically to lure species such as squid, with live bait preferred over dead ones for increased effectiveness. These practices reveal an ecological consciousness embedded in their day-to-day operations, highlighting a localized but informed strategy of ecosystem-based management. Overall, their approach to resource use reflects resilience not only in economic terms but also in sustaining ecological balance within the constraints of small-scale fishing.

Theme 3: Socioeconomic Challenges

The qualitative data revealed that small-scale fisherfolk in the coastal communities of Tuyom, Linaon, Caliling, and Isio in Cauayan face interrelated socioeconomic challenges that severely impact their capacity to sustain fishing-based livelihoods. These include restrictive government policies, the rising cost of fishing operations, diminishing returns from marine resources, and persistent financial insecurity. These barriers contribute to unstable income flows and limited access to the resources necessary for economic mobility, trapping many fisherfolk in cyclical poverty and making adaptation efforts more difficult. Two key sub-themes emerged under this category: Government Policies and Regulations and Financial Constraints.

Fisherfolk expressed concerns about the nature and implementation of government regulations in the fishing sector. While there is a general awareness of existing policies—especially those designed to protect juvenile fish and regulate gear types—small-scale fishers often feel disproportionately burdened by these laws. Many of the respondents reported that their fishing gear, particularly those with fine mesh sizes, are not eligible for registration, putting them at risk of penalties even though these tools are essential for subsistence fishing in nearshore areas. In contrast, they perceive larger-scale or more destructive fishing practices such as the use of compressors, chemicals, and large traps (*pamo*) as inconsistently regulated, contributing to perceptions of unfairness and marginalization.

The gap between policy intent and ground realities was evident in the fishers' experiences of local enforcement, which often lacked contextual sensitivity to the nature of traditional fishing practices. Additionally, fishers shared that while seminars and training are occasionally available, these often do not translate into meaningful support systems such as alternative livelihood programs, fishing gear subsidies, or inclusive decision-making. The lack of adaptive and localized policy measures further exacerbates the vulnerability of small-scale fishers who rely on marine resources for day-to-day survival.

Financial constraints emerged as a persistent and deeply entrenched challenge among fisherfolk. The cost of fishing—fuel, ice, food, rain protection, and bait—often outweighs the returns from a day's catch, especially with declining fish stocks. Many fishers described a hand-to-mouth existence, where fishing becomes a fallback activity whenever money or food runs out. This subsistence-based mode of livelihood leaves little room for savings or investment in better gear and technologies that might improve catch efficiency or sustainability.

The irregularity of income also discourages long-term planning and reduces the fisherfolk's ability to transition to more stable or diversified income sources. While some occasionally engage in farming or seasonal labor in the rice fields, fishing remains the dominant livelihood despite its growing economic uncertainty. The inability to access formal credit, coupled with the high interest rates of informal loans, further limits their financial resilience. This situation creates a vicious cycle where financial scarcity leads to dependence on low-cost, often non-compliant gear, which then exposes them to legal penalties and further economic hardship.

Theme 4: Marketing Dynamic

The qualitative findings underscored the evolving and often precarious nature of marketing dynamics among small-scale fisherfolk in the coastal barangays of Cauayan. While traditional relationships with loyal buyers (suki) have historically played a significant role in facilitating consistent income, these networks have become unstable due to external competition, buyer preference shifts, and limitations in fishers' capacity to respond to market disruptions. As a result, many fisherfolk are compelled to explore alternative, more labor-intensive strategies such as direct selling or delaying sales until fish reach a higher market value. Two sub-themes emerged under this category: Sales Performance and Market Understanding.

Sales performance among fisherfolk is shaped by multiple factors including species type, volume of catch, seasonality, and buyer relations. The daily income of fishers is highly variable, with earnings ranging from substantial amounts on productive days to near losses on days with minimal catch. Prices for different species are subject to fluctuation, with high-value species such as *tangigue* or gnow commanding better prices, while others like *baulo* or *bansa* sell for less per kilo. Fisherfolk who harvest *semilya* (juvenile fish) also experience varying levels of profitability depending on demand and buyer loyalty.

Patron-client arrangements such as the suki system significantly influence pricing and sales volume. When these relationships weaken or dissolve—due to supply disruptions or competition—fisherfolk face reduced market access and may be forced to absorb losses or adjust their strategies. This dynamic has resulted in increased dependence on flexible, informal sales mechanisms such as door-to-door marketing, waiting for demand to pick up, or allowing fish to grow larger before sale. Inconsistency in sales performance underscores the vulnerability of fishers to market volatility and limited control over pricing structures within the value chain.

The fisherfolk's grasp of market demands and buyer preferences is rooted in experience and local knowledge, yet constrained by logistical and infrastructural barriers. Participants demonstrated adaptive behaviors such as adjusting their marketing approaches based on observed demand, traveling to nearby communities to sell directly, and recognizing pricing advantages in different selling routes. Despite this, structural challenges—such as high

transportation costs, lack of cold storage, and limited access to organized cooperatives—continue to restrict their ability to fully engage with more profitable or stable markets.

Many fishers acknowledged the importance of understanding buyer behavior and cultural preferences, but they also highlighted frustrations in maintaining consistent sales channels. Instances where buyers ceased purchasing due to competition or shifting sources of supply resulted in lost income and wasted product. These experiences revealed the fragility of informal market systems and the difficulty of maintaining sustainable earnings in the absence of institutional support, market infrastructure, or integration into formalized distribution networks.

Theme 5: Environmental and Ecological Consideration

The findings reveal that environmental and ecological changes play a pivotal role in shaping the fishing activities and sustainability of small-scale fisherfolk communities in Cauayan, Negros Occidental. Participants acknowledged the unpredictability of sea conditions, changing weather patterns, and ecological shifts as key factors that directly influence their ability to fish, their daily catch, and overall livelihood viability. Despite these challenges, fisherfolk have developed adaptive strategies and sustainable practices rooted in both traditional knowledge and collective community response. Two key sub-themes emerged under this category: Sustainable Fishing Practices and Spatial Dynamics on Small-Scale Fishing.

Fisherfolk respondents emphasized the importance of aligning their fishing efforts with natural rhythms, such as tide cycles, seasonal wind patterns, and fish movement. They carefully monitor the environment before deciding to fish, often starting their day as early as 2:30 AM if conditions are favorable. Catch sharing within fishing crews and the avoidance of excessive harvests reflect principles of equity and restraint grounded in community values. These sustainable practices demonstrate how the fishers manage their operations not just for income, but also to maintain the ecological integrity of their fishing grounds.

Participants also described how they adjust to limited resources and uncertain yields through cooperative work arrangements, the use of selective fishing techniques, and rotating fishing zones. While some still rely on local fish traps like *pamo*, there is growing awareness that this alone is insufficient for sustainable survival. Some families have seen members migrate to urban areas like Bacolod due to dwindling returns, underscoring the urgency of balancing daily needs with ecological conservation. Overall, fisherfolk show a clear intent to adapt to changing environmental contexts while avoiding overexploitation and promoting long-term viability.

The spatial behavior of fisherfolk reflects a nuanced understanding of marine geography, ecological patterns, and regulatory constraints. Fishing grounds are selected based on traditional spatial knowledge, proximity to productive zones, and informal community agreements. Participants reported moving from formerly accessible areas—such as Sipalay, now restricted—to new locations like Bulata, which are less crowded and remain abundant with fish. The transition to alternative fishing grounds illustrates how fishers are responding to ecological depletion, rising competition, and localized enforcement of marine policies.

Spatial decision-making is also shaped by the avoidance of illegal activities and the desire for peaceful and productive fishing environments. For instance, some areas near *hulaw* (local sanctuaries) are now preferred due to higher fish density and lower levels of disruption. These spatial shifts represent a coping mechanism, but also reflect an ongoing need for inclusive marine governance that accounts for small-scale fishers' customary access rights and ecological stewardship. The movement patterns highlight both the flexibility and vulnerability of small-scale fishers in a rapidly transforming coastal landscape.

The study surveyed 104 small-scale fisherfolk from the coastal barangays of the Municipality of Cauayan, Negros Occidental. Most of the respondents (53.8%) belonged to Generation Y, followed by Generation X (28.8%) and Generation Z (17.3%). In terms of educational attainment, a large majority (68.3%) had completed high school, while 29.8% reached elementary level, and only 1.9% attained college education. The civil status distribution showed that most were married (61.5%), with single individuals comprising 34.6%, and widowed respondents at 3.8%.

The average number of years engaged in fishing was 21.9 years, with a nearly even split between those with shorter fishing experience (54.8%) and those with longer experience (45.2%). The respondents reported a mean monthly income of ₱1,996.20, with 52.9% earning above the mean and 47.1% earning below. Notably, the majority (69.2%)

relied solely on fishing for their livelihood, while others supplemented their income through livestock raising (9.6%), retail or small business (9.6%), agriculture (8.7%), and other activities (2.9%).

Extent of Adaptation Strategies Practiced by Small-Scale Fisherfolk

Table 1 presents the extent to which small-scale fisherfolk practiced adaptation strategies in three dimensions: the use of traditional and modern fishing methods, work ethic and resourcefulness, and overall commitment to fishing. On the whole, respondents demonstrated a moderate level of adaptation (M = 3.05, SD = 0.68) across all dimensions.

Table 1
Extent of Adaptation Strategies as Practiced by Small-scale Fisherfolk

Variable	**Use of Traditional and Modern Fishing Methods**			**Work Ethic, Resourcefulness, and Commitment to Fishing**			**Adaptation**		
	M	**SD**	**Int**	**M**	**SD**	**Int**	**M**	**SD**	**Int**
Age									
Generation X	3.05	0.65	Moderate	3.05	0.65	Moderate	3.05	0.65	Moderate
Generation Y	3.11	0.71	Moderate	3.11	0.71	Moderate	3.11	0.71	Moderate
Generation Z	2.85	0.66	Moderate	2.85	0.66	Moderate	2.85	0.66	Moderate
Educational Attainment									
Elementary	3.12	0.70	Moderate	3.12	0.70	Moderate	3.12	0.70	Moderate
High School	3.01	0.68	Moderate	3.01	0.68	Moderate	3.01	0.68	Moderate
College	3.29	0.00	Moderate	3.29	0.00	Moderate	3.29	0.00	Moderate
Civil Status									
Single	2.92	0.64	Moderate	2.92	0.64	Moderate	2.92	0.64	Moderate
Married	3.13	0.71	Moderate	3.13	0.71	Moderate	3.13	0.71	Moderate
Widowed	2.93	0.58	Moderate	2.93	0.58	Moderate	2.93	0.58	Moderate
Years Being a Fisher									
Shorter	3.06	0.68	Moderate	3.06	0.68	Moderate	3.06	0.68	Moderate
Longer	3.04	0.69	Moderate	3.04	0.69	Moderate	3.04	0.69	Moderate
Monthly Income									
Lower	3.16	0.70	Moderate	3.16	0.70	Moderate	3.16	0.70	Moderate
Higher	2.96	0.65	Moderate	2.96	0.65	Moderate	2.96	0.65	Moderate
Additional Source of Income									
None	2.91	0.68	Moderate	2.91	0.68	Moderate	2.91	0.68	Moderate
Livestock	3.51	0.42	Great	3.51	0.42	Great	3.51	0.42	Great
Agriculture	3.10	0.39	Moderate	3.10	0.39	Moderate	3.10	0.39	Moderate
Retail/business	3.54	0.72	Great	3.54	0.72	Great	3.54	0.72	Great
Others	3.19	0.81	Moderate	3.19	0.81	Moderate	3.19	0.81	Moderate
Whole	***3.05***	***0.68***	***Moderate***	***3.05***	***0.68***	***Moderate***	***3.05***	***0.68***	***Moderate***

Mean Range: 1.00-1.80=Very Poor, 1.81-2.60=Poor, 2.61-3.40=Moderate, 3.41-4.20=Great, 4.21-5.00=Very Great

When grouped by age, Generation Y fishers (M = 3.11) reported slightly higher adaptive practices than those from Generation X (M = 3.05) and Generation Z (M = 2.85), though all age groups still reflected a moderate level of adaptation. In terms of educational attainment, those with college education had the highest mean score (M = 3.29), followed by elementary (M = 3.12) and high school graduates (M = 3.01), indicating that education may play a subtle role in enhancing adaptive capacity.

For civil status, married respondents (M = 3.13) registered higher adaptation levels than their single (M = 2.92) and widowed (M = 2.93) counterparts. Meanwhile, the length of fishing experience appeared to have little influence, with both the shorter-experienced (M = 3.06) and longer-experienced (M = 3.04) groups reporting nearly identical moderate adaptation scores.

Interestingly, monthly income showed a reverse trend, as those with lower income (M = 3.16) reported greater adaptation than those with higher income (M = 2.96), suggesting that financial necessity may drive more strategic fishing behavior. The most notable variation emerged under the presence of additional income sources. Fishers engaged in retail/business (M = 3.54) and livestock raising (M = 3.51) exhibited a great extent of adaptation, while those relying solely on fishing (M = 2.91) reflected only moderate levels. This underscores the value of income diversification in enhancing adaptive strategies.

Extent of Resilience of Small-Scale Fisherfolk

The extent of resilience among small-scale fisherfolk in the Municipality of Cauayan was measured across two dimensions: community resilience and resource management strategies. The results indicate an overall great extent of resilience (M = 3.72, SD = 0.46), with community resilience averaging M = 3.43 and resource management strategies at M = 4.01, both interpreted as great.

When grouped by age, Generation Y reported the highest resilience scores (M = 3.76), followed closely by Generation Z (M = 3.73) and Generation X (M = 3.64). While all three age groups exhibited great resilience overall, Generation Z showed a slightly lower score in the community resilience dimension (M = 3.37), interpreted as moderate, despite scoring high in resource management (M = 4.10).

Table 2

Extent of Resilience of Small-scale Fisherfolk

Variable	Community Resilience			Resource Management Strategies			Resilience		
	M	**SD**	**Int**	**M**	**SD**	**Int**	**M**	**SD**	**Int**
Age									
Generation X	3.43	0.63	Great	3.86	0.57	Great	3.64	0.46	Great
Generation Y	3.45	0.64	Great	4.07	0.57	Great	3.76	0.46	Great
Generation Z	3.37	0.57	Moderate	4.10	0.49	Great	3.73	0.46	Great
Educational Attainment									
Elementary	3.50	0.63	Great	4.08	0.50	Great	3.79	0.42	Great
High School	3.40	0.63	Moderate	3.98	0.59	Great	3.69	0.48	Great
College	3.50	0.14	Great	4.10	0.71	Great	3.80	0.28	Great
Civil Status									
Single	3.32	0.66	Moderate	4.09	0.49	Great	3.71	0.51	Great
Married	3.50	0.60	Great	3.96	0.60	Great	3.73	0.44	Great
Widowed	3.30	0.60	Moderate	4.20	0.28	Great	3.75	0.44	Great
Years Being a Fisher									
Shorter	3.41	0.61	Great	4.05	0.54	Great	3.73	0.46	Great
Longer	3.45	0.63	Great	3.97	0.59	Great	3.71	0.47	Great
Monthly Income									
Lower	3.35	0.50	Moderate	4.00	0.56	Great	3.67	0.41	Great
Higher	3.51	0.71	Great	4.03	0.56	Great	3.77	0.50	Great
Additional Source of Income									
None	3.38	0.61	Moderate	4.03	0.51	Great	3.71	0.43	Great
Livestock	3.86	0.67	Great	4.32	0.52	Very Great	4.09	0.53	Great
Agriculture	3.11	0.48	Moderate	3.89	0.67	Great	3.50	0.40	Great
Retail/business	3.42	0.35	Great	3.58	0.67	Great	3.50	0.37	Great
Others	4.20	0.72	Great	4.40	0.35	Very Great	4.30	0.53	Very Great
Whole	***3.43***	***0.62***	***Great***	***4.01***	***0.56***	***Great***	***3.72***	***0.46***	***Great***

Mean Range: 1.00-1.80=Very Poor, 1.81-2.60=Poor, 2.61-3.40=Moderate, 3.41-4.20=Great, 4.21-5.00=Very Great

In terms of educational attainment, all groups demonstrated great resilience, with college-educated fishers registering the highest overall resilience (M = 3.80). Those with elementary education also reported strong resilience (M = 3.79), particularly in the area of resource management strategies (M = 4.08). High school graduates, while still showing great resilience (M = 3.69), had a slightly lower mean in community resilience (M = 3.40), bordering on moderate.

Regarding civil status, married fisherfolk reported slightly higher resilience (M = 3.73) than their single and widowed counterparts, both of whom scored lower in the community resilience subdomain (M = 3.32 and M = 3.30, respectively), interpreted as moderate.

Based on years of fishing experience, both groups (shorter and longer experience) exhibited great resilience (M = 3.73 and M = 3.71, respectively), with comparable scores across both subdomains.

By income level, fisherfolk with higher income reported stronger resilience (M = 3.77) than those with lower income (M = 3.67). While both groups rated great overall, those in the higher income bracket also had better community resilience (M = 3.51 vs. M = 3.35).

The most pronounced variation appeared when grouped by presence of additional income sources. Respondents with no additional income showed moderate community resilience (M = 3.38) but still attained a great overall score (M = 3.71). In contrast, those with income from livestock (M = 4.09) and other sources (M = 4.30) exhibited the highest levels of resilience, with very great scores in resource management (M = 4.32 and M = 4.40, respectively). Respondents in agriculture and retail/business scored lower in community resilience (M = 3.11 and M = 3.42) yet maintained great overall resilience.

Extent of Socioeconomic Challenges Encountered by Small-Scale Fisherfolk

The study assessed the extent of socioeconomic challenges among small-scale fisherfolk across two dimensions: government policies and regulations, and financial constraints. The overall mean score for socioeconomic challenges was 3.65 (SD = 0.30), interpreted as great, indicating that fisherfolk generally face considerable socioeconomic pressures in their livelihood. Specifically, financial constraints were encountered to a very great extent (M = 4.23, SD = 0.53), while experiences with government policies and regulations were moderate (M = 3.07, SD = 0.41).

Table 3
Extent Socioeconomic Challenges Encountered by Small-scale Fisherfolk

Variable	Government Policies and Regulations			Financial Constraints			Socioeconomic Challenges		
	M	**SD**	**Int**	**M**	**SD**	**Int**	**M**	**SD**	**Int**
Age									
Generation X	3.00	0.32	Moderate	4.23	0.56	Very Great	3.62	0.30	Great
Generation Y	3.06	0.45	Moderate	4.23	0.54	Very Great	3.65	0.29	Great
Generation Z	3.21	0.39	Moderate	4.19	0.49	Great	3.70	0.32	Great
Educational Attainment									
Elementary	3.08	0.43	Moderate	4.26	0.58	Very Great	3.67	0.32	Great
High School	3.06	0.41	Moderate	4.23	0.51	Very Great	3.64	0.29	Great
College	3.17	0.24	Moderate	3.70	0.42	Great	3.43	0.09	Great
Civil Status									
Single	3.06	0.41	Moderate	4.20	0.43	Great	3.63	0.25	Great
Married	3.09	0.41	Moderate	4.23	0.59	Very Great	3.66	0.33	Great
Widowed	2.79	0.34	Moderate	4.45	0.30	Very Great	3.62	0.12	Great
Years Being a Fisher									
Shorter	3.12	0.43	Moderate	4.28	0.46	Very Great	3.70	0.29	Great
Longer	3.01	0.38	Moderate	4.16	0.61	Great	3.59	0.29	Great
Monthly Income									
Lower	3.07	0.43	Moderate	4.33	0.54	Very Great	3.70	0.30	Great
Higher	3.07	0.39	Moderate	4.13	0.52	Great	3.60	0.29	Great
Additional Source of Income									
None	3.02	0.45	Moderate	4.28	0.55	Very Great	3.65	0.32	Great
Livestock	3.17	0.16	Moderate	4.12	0.14	Great	3.64	0.14	Great
Agriculture	3.11	0.22	Moderate	3.87	0.44	Great	3.49	0.16	Great
Retail/business	3.27	0.38	Moderate	4.34	0.60	Very Great	3.80	0.28	Great
Others	3.17	0.00	Moderate	4.00	0.80	Great	3.58	0.40	Great
Whole	***3.07***	***0.41***	***Moderate***	***4.23***	***0.53***	***Very Great***	***3.65***	***0.30***	***Great***

Mean Range: 1.00-1.80=Very Poor, 1.81-2.60=Poor, 2.61-3.40=Moderate, 3.41-4.20=Great, 4.21-5.00=Very Great

Across age groups, all generations reported moderate difficulties with policies (ranging from M = 3.00 to M = 3.21), while rating financial challenges very great, especially Generation X and Y (M = 4.23). Overall socioeconomic challenges were rated great across all age brackets, with Generation Z slightly higher (M = 3.70).

Regarding educational attainment, fisherfolk with elementary (M = 3.67) and high school education (M = 3.64) perceived greater overall socioeconomic pressure than those with college-level education (M = 3.43). This trend is consistent with financial constraints being rated very great by lower-educated groups (M = 4.26 and M = 4.23, respectively), whereas college graduates rated it lower at great (M = 3.70).

In terms of civil status, both single (M = 3.63) and married respondents (M = 3.66) rated their challenges as great, but widowed respondents, despite the lowest rating on policy challenges (M = 2.79, moderate), rated financial constraints to a very great extent (M = 4.45), resulting in an overall great level (M = 3.62).

When grouped by years of fishing experience, fisherfolk with shorter tenure perceived greater challenges (M = 3.70) compared to those with longer experience (M = 3.59). Notably, those with shorter experience reported very great financial constraints (M = 4.28), while those with longer experience rated them slightly lower (M = 4.16).

By monthly income, both lower-income and higher-income groups rated government policy challenges as moderate (M = 3.07 for both). However, the lower-income group reported more severe financial constraints (M = 4.33) compared to the higher-income group (M = 4.13), leading to slightly higher overall socioeconomic challenge levels (M = 3.70 vs. M = 3.60).

Lastly, in terms of alternative income sources, respondents with no additional livelihood encountered financial challenges to a very great extent (M = 4.28), with an overall great socioeconomic challenge score (M = 3.65). Among those with additional income, retail/business earners rated the overall challenge highest (M = 3.80), followed by those with livestock (M = 3.64) and others (M = 3.58). Notably, even those with supplementary income continued to experience very great financial constraints, suggesting that diversification alone may not be sufficient to buffer economic vulnerability.

Extent of Marketing Dynamics Among Small-Scale Fisherfolk

Table 4
Extent marketing Dynamics among Small-scale Fisherfolk

Variable	Sales Performance			Market Understanding			Marketing Dynamics in Fishing		
	M	SD	Int	M	SD	Int	M	SD	Int
Age									
Generation X	4.24	1.00	Very Great	4.19	0.64	Great	4.22	0.74	Very Great
Generation Y	4.32	0.91	Very Great	4.10	0.70	Great	4.21	0.74	Great
Generation Z	4.65	0.69	Very Great	4.59	0.51	Very Great	4.62	0.53	Very Great
Educational Attainment									
Elementary	4.39	0.86	Very Great	4.27	0.70	Very Great	4.33	0.72	Very Great
High School	4.32	0.94	Very Great	4.18	0.67	Great	4.25	0.73	Very Great
College	5.00	0.00	Very Great	4.50	0.71	Very Great	4.75	0.35	Very Great
Civil Status									
Single	4.34	0.89	Very Great	4.17	0.65	Great	4.25	0.69	Very Great
Married	4.41	0.90	Very Great	4.27	0.69	Very Great	4.34	0.73	Very Great
Widowed	3.50	1.00	Great	3.67	0.27	Great	3.58	0.62	Great
Years Being a Fisher									
Shorter	4.48	0.83	Very Great	4.26	0.64	Very Great	4.37	0.66	Very Great
Longer	4.20	0.98	Great	4.15	0.71	Great	4.17	0.78	Great
Monthly Income									
Lower	4.32	0.93	Very Great	4.26	0.70	Very Great	4.29	0.74	Very Great
Higher	4.38	0.90	Very Great	4.17	0.65	Great	4.28	0.71	Very Great
Additional Source of Income									
None	4.11	0.99	Great	4.07	0.68	Great	4.09	0.76	Great
Livestock	4.97	0.11	Very Great	4.30	0.48	Very Great	4.63	0.26	Very Great
Agriculture	4.89	0.24	Very Great	4.56	0.60	Very Great	4.72	0.37	Very Great
Retail/business	4.90	0.22	Very Great	4.80	0.42	Very Great	4.85	0.29	Very Great
Others	4.78	0.38	Very Great	4.33	0.67	Very Great	4.56	0.38	Very Great
Whole	***4.35***	***0.91***	***Very Great***	***4.21***	***0.67***	***Very Great***	***4.28***	***0.72***	***Very Great***

Mean Range: 1.00-1.80=Very Poor, 1.81-2.60=Poor, 2.61-3.40=Moderate, 3.41-4.20=Great, 4.21-5.00=Very Great

Marketing dynamics in small-scale fisheries were assessed across two key indicators: sales performance and market understanding. The overall results revealed that small-scale fisherfolk demonstrated a very great extent of marketing engagement (M = 4.28, SD = 0.72). Both sales performance (M = 4.35, SD = 0.91) and market understanding (M

= 4.21, SD = 0.67) were likewise rated as very great, suggesting a strong capacity among fisherfolk to market their catch, maintain buyer relationships, and understand market trends despite structural limitations.

When grouped by age, all generations reported very great sales performance, with Generation Z showing the highest overall marketing dynamics (M = 4.62), and Generation X and Y close behind (M = 4.22 and M = 4.21, respectively). Notably, Generation Z also rated market understanding to a very great extent (M = 4.59), indicating greater adaptability and market savvy among younger fisherfolk.

In terms of educational attainment, fisherfolk across all groups reported very great levels of marketing dynamics, with those who attained college education scoring the highest (M = 4.75), followed by elementary (M = 4.33) and high school graduates (M = 4.25). This suggests that marketing proficiency may be positively associated with educational background.

By civil status, both single (M = 4.25) and married fisherfolk (M = 4.34) demonstrated very high engagement in marketing activities, whereas widowed respondents reported only great engagement (M = 3.58), possibly reflecting reduced activity or mobility due to personal or household constraints.

For years of fishing experience, those with shorter tenure exhibited higher marketing dynamics (M = 4.37) than those with longer experience (M = 4.17), with higher scores in both sales performance and market understanding. This may indicate that newer entrants are more proactive or experimental in their approach to selling fish products, including use of informal and direct selling practices.

Regarding monthly income, both lower-income (M = 4.29) and higher-income groups (M = 4.28) demonstrated very great levels of marketing engagement. This shows that marketing dynamics are consistently strong across income levels, possibly because fisherfolk in both groups seek to maximize income through diversified buyer interactions or price negotiation strategies.

Finally, by additional income source, respondents involved in retail/business (M = 4.85), agriculture (M = 4.72), and livestock raising (M = 4.63) showed significantly higher marketing dynamics than those with no supplementary livelihood (M = 4.09). These fisherfolk rated both sales performance and market understanding as very great, indicating that those engaged in complementary economic activities may possess stronger entrepreneurial capacity and broader market exposure.

Extent of Environmental and Ecological Consideration Among Small-Scale Fisherfolk

Table 5
Extent of Environmental and Ecological Consideration among Small-scale Fisherfolk

Variable	Sustainable Fishing Practices			Spatial Dynamics in Small-scale Fisheries			Environmental and Ecological Consideration		
	M	SD	Int	M	SD	Int	M	SD	Int
Age									
Generation X	4.24	1.00	Very Great	4.19	0.64	Great	4.22	0.74	Very Great
Generation Y	4.32	0.91	Very Great	4.10	0.70	Great	4.21	0.74	Great
Generation Z	4.65	0.69	Very Great	4.59	0.51	Very Great	4.62	0.53	Very Great
Educational Attainment									
Elementary	4.39	0.86	Very Great	4.27	0.70	Very Great	4.33	0.72	Very Great
High School	4.32	0.94	Very Great	4.18	0.67	Great	4.25	0.73	Very Great
College	5.00	0.00	Very Great	4.50	0.71	Very Great	4.75	0.35	Very Great
Civil Status									
Single	4.34	0.89	Very Great	4.17	0.65	Great	4.25	0.69	Very Great
Married	4.41	0.90	Very Great	4.27	0.69	Very Great	4.34	0.73	Very Great
Widowed	3.50	1.00	Great	3.67	0.27	Great	3.58	0.62	Great
Years Being a Fisher									
Shorter	4.48	0.83	Very Great	4.26	0.64	Very Great	4.37	0.66	Very Great
Longer	4.20	0.98	Great	4.15	0.71	Great	4.17	0.78	Great
Monthly Income									
Lower	4.32	0.93	Very Great	4.26	0.70	Very Great	4.29	0.74	Very Great
Higher	4.38	0.90	Very Great	4.17	0.65	Great	4.28	0.71	Very Great

Additional Source of Income									
None	4.11	0.99	Great	4.07	0.68	Great	4.09	0.76	Great
Livestock	4.97	0.11	Very Great	4.30	0.48	Very Great	4.63	0.26	Very Great
Agriculture	4.89	0.24	Very Great	4.56	0.60	Very Great	4.72	0.37	Very Great
Retail/business	4.90	0.22	Very Great	4.80	0.42	Very Great	4.85	0.29	Very Great
Others	4.78	0.38	Very Great	4.33	0.67	Very Great	4.56	0.38	Very Great
Whole	***4.35***	***0.91***	***Very Great***	***4.21***	***0.67***	***Very Great***	***4.28***	***0.72***	***Very Great***

Mean Range: 1.00-1.80=Very Poor, 1.81-2.60=Poor, 2.61-3.40=Moderate, 3.41-4.20=Great, 4.21-5.00=Very Great

The environmental and ecological consideration among small-scale fisherfolk was measured in terms of sustainable fishing practices and spatial dynamics. The overall mean score across all respondents for environmental and ecological consideration was rated very great (M = 4.28, SD = 0.72), with sustainable fishing practices scoring slightly higher (M = 4.35, SD = 0.91) than spatial dynamics (M = 4.21, SD = 0.67). These results suggest a widespread and conscious effort among fisherfolk to balance livelihood needs with ecosystem stewardship and space-based fishing strategies.

Across age groups, Generation Z exhibited the highest awareness and application of environmental and ecological practices (M = 4.62), with both sustainable fishing (M = 4.65) and spatial awareness (M = 4.59) rated very great. Meanwhile, Generation X (M = 4.22) and Generation Y (M = 4.21) also demonstrated high levels of environmental consideration, although their spatial dynamics were slightly lower compared to their sustainable practice scores.

When grouped by educational attainment, all respondents—regardless of level—rated their environmental and ecological considerations as very great. College-educated respondents had the highest composite rating (M = 4.75), indicating that formal education may contribute to stronger environmental awareness and spatial decision-making. Similarly, both elementary (M = 4.33) and high school graduates (M = 4.25) also expressed consistent ecological commitment in their fishing practices.

For civil status, married respondents showed the strongest ecological awareness (M = 4.34), followed by single fisherfolk (M = 4.25). Widowed respondents, however, rated this dimension slightly lower, at only a great extent (M = 3.58), potentially indicating reduced engagement or challenges related to physical activity or participation in community-based initiatives.

The results also revealed that fisherfolk with shorter years of experience expressed a higher degree of environmental and spatial engagement (M = 4.37), compared to their more experienced counterparts (M = 4.17), suggesting that newer or younger fishers may be more attuned to evolving ecological practices or community-enforced norms. This finding parallels the earlier observation on adaptation and marketing strategies.

When disaggregated by monthly income, both lower-income (M = 4.29) and higher-income fisherfolk (M = 4.28) demonstrated very great ecological considerations, indicating consistent valuation of sustainability regardless of economic status.

The presence of an additional source of income was associated with even higher levels of ecological awareness. Fisherfolk engaged in retail or business (M = 4.85), agriculture (M = 4.72), and livestock raising (M = 4.63) showed exceptional ratings in both sustainable fishing and spatial strategies. By contrast, those without any alternative income source reported a slightly lower but still great extent (M = 4.09). This trend suggests that individuals with diversified livelihoods may be more capable or motivated to adopt sustainable practices, possibly due to greater resource access or broader exposure to conservation principles.

Discussion:

The integration of qualitative themes and quantitative validation revealed the multidimensionality of small-scale fisheries, characterized by adaptive livelihood behaviors, community resilience, and complex socioeconomic and ecological challenges. The findings affirm earlier scholarship on sustainable livelihoods and fisheries governance, while offering nuanced insights rooted in local experiences.

The moderate extent of adaptation strategies (M = 3.05) suggests that fisherfolk are actively integrating both traditional and modern fishing methods. The use of hook-and-line, bamboo traps, and seine nets alongside motorized boats and fish-finding devices reflects a dynamic livelihood strategy aimed at balancing ecological awareness, cost constraints, and catch efficiency. This supports the framework of the Sustainable Livelihoods Approach, which

emphasizes the importance of flexibility and resourcefulness in rural livelihood systems (Allison & Horemans, 2006; Chambers & Conway, 1991).

Moreover, the high ratings for adaptation among those with supplementary incomes (e.g., retail or livestock) highlight the value of livelihood diversification—a core component of resilience-building in fishing communities (Pomeroy et al., 2017; ADB, 2024). These fisherfolk demonstrate greater ability to buffer shocks and engage in calculated risk-taking, supporting the argument that economic diversity contributes to sustainability in resource-dependent sectors (Barbier, 2015).

Resilience (M = 3.72) emerged as a strength among fisherfolk, particularly in resource management practices. The use of recycled materials, communal repair systems, and ecologically informed baiting and lighting techniques reflects what Chambers and Conway (1991) refer to as "endogenous development"—resourcefulness emerging from within the community. This resonates with Berkes et al. (2003, as cited in Pomeroy et al., 2001), who underscore the value of local ecological knowledge and participatory management in small-scale fisheries. However, relatively lower resilience ratings among younger and socially marginalized fishers (e.g., widowed) suggest disparities in social capital and knowledge access, echoing concerns raised by Kusakabe et al. (2022) about unequal roles and vulnerabilities in small-scale fishing households.

The study revealed that socioeconomic challenges were the most intensely felt dimension, with financial constraints rated very great (M = 4.23) and government regulations rated moderately (M = 3.07). These findings illustrate a persistent mismatch between regulatory frameworks and ground-level realities. Fisherfolk noted the inaccessibility of formal registration for traditional gear types and the perceived double standards in enforcement—issues echoed in earlier work on fisheries law compliance in the Philippines (Catedrilla et al., 2012; Baco & Baco, 2022). Despite the intentions of Republic Act 8550 to promote equitable and sustainable fisheries, its local implementation appears to lack flexibility for small-scale fishers (Republic Act No. 8550, 1998; BFAR, 2022).

The income volatility and daily subsistence patterns of fisherfolk validate findings by Muallil et al. (2014), who documented a five-decade trend of declining catch and economic instability in Philippine small-scale fisheries. The inability to access formal loans and reliance on informal, high-interest credit schemes further entrench financial vulnerability—a dynamic also observed by Pomeroy et al. (2020) and Chakraborty & Dhawan (2025) in their studies on financial inclusion and fisheries-based resilience. These systemic financial barriers hinder innovation, capacity-building, and long-term livelihood planning.

In terms of marketing dynamics, the very great overall rating (M = 4.28) highlights fisherfolk's adaptive knowledge of market trends, pricing strategies, and buyer relationships. While suki systems remain prevalent, many fishers have adopted alternative strategies such as direct-to-consumer sales and delayed harvesting. These informal but agile marketing strategies mirror local economies observed by Fabinyi et al. (as cited in Tolentino-Zondervan & Zondervan, 2022), where traditional knowledge and relational capital help buffer market disruptions. However, qualitative data caution that such informal systems are vulnerable to sudden shocks, supply inconsistencies, and lack of infrastructure like cold storage and cooperative linkages (ADB, 2024).

Lastly, environmental and ecological consideration was also rated very great (M = 4.28), affirming that small-scale fisherfolk possess a strong environmental ethic and nuanced understanding of marine spatial dynamics. They apply tide-based planning, selective fishing, and avoidance of overharvesting—practices that align with ecosystem-based management (Pomeroy et al., 2001). Moreover, the movement of fisherfolk from overfished zones to less exploited ones reflects a practical application of marine spatial planning and sanctuary-based resource use, as supported by EMB Region VI (2021) and PSA (2023).

Nonetheless, barriers to sustained environmental practices remain. These include spatial competition, lack of marine tenure rights, and inconsistent enforcement of ecological policies—issues that require inclusive marine governance structures sensitive to customary practices and local livelihoods (Allison & Horemans, 2006; Kusakabe et al., 2022). As climate change further alters marine environments, the role of small-scale fishers as environmental stewards becomes even more critical (Garai, 2014; ADB, 2024).

In sum, this study confirms that small-scale fisherfolk in Cauayan are resilient, ecologically informed, and strategically adaptive—but are also burdened by structural limitations, particularly in finance, market access, and policy alignment. Enhancing their agency requires context-specific, participatory interventions that build on existing capacities while addressing systemic inequalities in fisheries governance and rural development.

Conclusion:

This study provided a comprehensive understanding of the livelihood realities of small-scale fisherfolk in the coastal barangays of Tuyom, Linaon, Caliling, and Isio in the Municipality of Cauayan, Negros Occidental. Using a sequential exploratory mixed-methods approach, the research first drew rich qualitative insights from in-depth narratives and then validated and extended these findings through a structured quantitative survey.

The qualitative phase revealed deeply embedded socio-cultural and ecological practices, highlighting the resilience, adaptability, and local knowledge systems that sustain small-scale fisheries amid persistent poverty, regulatory tensions, and environmental stress. Themes such as adaptation strategies, community resilience, marketing dynamics, and environmental consciousness underscored the resourcefulness and agency of fisherfolk, while also exposing systemic gaps in policy support, infrastructure, and financial inclusion.

The quantitative phase confirmed these findings by illustrating the moderate to high extent of adaptation and resilience practices and the prevalence of very great financial constraints across demographic groups. It also revealed nuanced trends—for instance, higher adaptive capacities among fisherfolk with diversified incomes, and greater environmental consideration among younger fishers and those with higher educational attainment. Despite these strengths, the data reinforced that government regulations are perceived as burdensome or misaligned, and that access to institutional support systems remains limited.

Together, these findings emphasize that small-scale fisherfolk are not passive victims of poverty or climate variability but are active agents employing complex strategies to sustain their livelihoods. However, their resilience has limits. Structural issues—such as uneven policy enforcement, market vulnerabilities, and exclusion from financial and institutional safety nets—continue to constrain their development and long-term viability.

This study concludes that sustainable interventions must recognize and strengthen the existing capacities of small-scale fishers while addressing systemic challenges. Policies must be localized, inclusive, and context-sensitive—grounded in the realities of those who live closest to the sea and whose daily survival depends on its resources. Only through such integrated, responsive, and participatory approaches can small-scale fisheries in the Philippines move toward resilience, equity, and sustainability.

Based on the findings, it is recommended that local government units and relevant agencies adopt a multi-pronged, inclusive approach to support small-scale fisherfolk. This includes tailoring policies to recognize traditional fishing methods, expanding access to financial services and equipment subsidies, and enhancing market integration through cooperative-based models and cold storage infrastructure. Capacity-building programs should prioritize both men and women in fishing households, promoting sustainable practices and environmental stewardship. Strengthening participatory governance, particularly in marine resource management and livelihood planning, can empower fisherfolk to co-manage resources and build long-term resilience amid ecological and economic uncertainties.

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