

Fisherfolk Adaptation and Mitigation Strategies on Climate Change in Selected Coastal Barangays

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Abstract

This study determined the level of adaptation and the use of mitigation strategies to climate change among fisherfolk in selected coastal barangays in Southern Negros during the second quarter of Calendar Year 2026, as a basis for an entrepreneurial development plan. The study examined the respondents' profiles in terms of age, sex, and average monthly family income, and assessed their adaptation and mitigation strategies for sustainable fishing practices, livelihood diversification, and community-based management. A descriptive research design was utilized using a validated and reliable self-made questionnaire. A total of 178 fisherfolk respondents were selected through stratified random sampling. Data were analyzed using frequency counts, percentages, means, and the Mann-Whitney U test. Findings showed that fisherfolk demonstrated moderate adaptation strategies and moderate to high mitigation strategies on climate change. Sustainable fishing practices obtained the highest ratings, while community-based management and livelihood programs received lower ratings. An entrepreneurial development plan was proposed to strengthen resilience, sustainability, and economic opportunities among fisherfolk communities.

Keywords: *Climate change adaptation; mitigation strategies; fisherfolk communities; livelihood diversification; sustainable fishing practices*

Bio-profile

Winnie Joy C. Mananap is an Associate Professor under the College of Business Management and Accountancy at STI West Negros University. She earned her Master in Business Administration (MBA) and is currently pursuing a Doctor in Business Administration (DBA). She is passionate about research, education, and community development, with academic interests in business management, marketing research, sustainability, and social awareness. Known for her dedication to teaching and student mentorship, she actively engages in research initiatives that contribute to community empowerment and organizational development. Her commitment to academic excellence and lifelong learning continues to inspire her students and colleagues in the field of business education.



Introduction

Rationale

Climate change has emerged as one of the most pressing global challenges affecting coastal ecosystems and the livelihoods of millions of people who depend on fisheries for survival. Climate change refers to long-term changes in the Earth's climate system, including rising average temperatures, shifts in rainfall patterns, sea-level rise, and more frequent extreme weather events, largely driven by human activities such as burning fossil fuels and deforestation (Kumar, 2026). Rising sea surface temperatures, ocean acidification, unpredictable weather patterns, and stronger typhoons have significantly affected fisheries productivity and the economic stability of fishing communities (United Nations, 2023). Small-scale fisherfolk are among the most vulnerable sectors because their livelihood depends heavily on marine resources and environmental conditions (Cadiz et al., 2024).

Nabor (2025) noted that coastal communities in the Philippines continuously experience climate-related hazards, including monsoons, storm surges, sea-level rise, and typhoons, resulting in livelihood disruptions, declining fish catch, and food insecurity. Despite the implemented adaptation strategies by national and subnational agencies, such as disaster preparedness programs and nature-based solutions, fishing communities continue to encounter difficulties in coping with the long-term impacts of climate change.

One important climate adaptation strategy is the practice of sustainable fishing. According to Kshatri et al. (2026), sustainable fishing is a proactive strategy that aligns harvesting methods with aquatic ecosystems' inherent capacity to regenerate. It protects fish stocks for future generations by ensuring that fishing operations don't exceed ecological limits. On the social and economic levels, sustainable fishing practices may benefit local economies by creating permanent fishing jobs and supporting communities that rely on fishing as their primary source of revenue. However, overfishing is a global threat, resulting in declines in species, altered ecosystems, and economic losses (Morgan, 2024).

Another important strategy is livelihood diversification. Martin and Lorenzen (2016) defined this as the process by which families, particularly in rural regions, establish a range of occupations and resources to enhance quality of life, raise income, and establish strength in response to crises. This is a crucial, often necessary, adaptation strategy for fisherfolk facing the accelerating impacts of climate change, which include dwindling fish stocks, destruction of fishing gear, and severe income instability (Calica et al., 2025).

Community-based management also plays a significant role in strengthening climate resilience among coastal communities. Kleiber et al. (2021) defined community-



based management as local initiatives where community members actively participate in coastal preservation, restoration, and sustainable resource management. Through collective participation and cooperation, communities become better able to protect marine ecosystems, implement conservation programs, and respond effectively to environmental challenges driven by climate change.

This study also contributes to the United Nations Sustainable Development Goals (SDGs), particularly SDG 13: Climate Action, SDG 14: Life Below Water, and SDG 8: Decent Work and Economic Growth. By identifying the adaptation and mitigation strategies of fisherfolk, the study may provide insights for local government units, fisheries agencies, and community organizations in designing entrepreneurial and climate-resilient programs for coastal communities.

Literature Review

Climate change continues to affect marine ecosystems worldwide, underscoring the importance of sustainable fishing practices among fisherfolk communities. Barange et al. (2018) emphasized that climate change continues to affect marine ecosystems worldwide, underscoring the importance of sustainable fishing practices for small-scale fisherfolk communities. Similarly, Woods et al. (2022) stressed the importance of flexible fisheries management strategies that can respond to changing species distribution, unstable fish productivity, and environmental variability.

Furthermore, Galappaththi et al. (2022) explained that restoration programs, stock rebuilding, and climate-responsive governance are essential strategies in achieving sustainable fisheries management. Moreover, Salgueiro-Otero et al. (2022) described livelihood diversification as both a coping mechanism and a long-term adaptation strategy for fisherfolk communities.

Additionally, Huynh et al. (2021) found that fishing households in Vietnam increasingly rely on alternative income sources, such as aquaculture, wage labor, and small businesses, to mitigate the effects of low fish catch and unfavorable weather conditions. Likewise, Allison and Ellis (2021) emphasized that livelihood diversification reduces the vulnerability of fishing households by providing additional sources of income during climate-related disruptions and periods of low fish catch.

In addition, Cinner et al. (2018) explained that low participation in livelihood training programs may be due to financial constraints, limited access to programs, and low community involvement. Moreover, Gutiérrez et al. (2019) stated that active participation of fisherfolk in monitoring and managing marine resources contributes to improved ecological conditions and better compliance with fisheries regulations. The study emphasized that community involvement is important in promoting sustainable fisheries management.

On the other hand, Tyedmers et al. (2018) identified fuel efficiency as an important mitigation strategy in the fishing industry, as fuel consumption is a major



contributor to greenhouse gas emissions. Furthermore, Parker et al. (2018) emphasized that optimizing fishing routes and reducing unnecessary travel can significantly lower fuel consumption, operational costs, and environmental damage.

Additionally, Adger et al. (2018) explained that sustainable resource management and livelihood diversification can indirectly contribute to climate change mitigation by reducing pressure on marine ecosystems. Moreover, Allison and Ellis (2021) stressed that sustainable alternative livelihoods, such as ecotourism, aquaculture, and green enterprises, can reduce dependence on fishing while promoting environmental preservation. These activities help strengthen economic stability and climate resilience among fisherfolk communities.

Theoretical Underpinnings

The study is anchored in the Climate Change Adaptation and Resilience Theory, which combines the concepts of resilience and adaptation to understand how communities respond to climate change. Holling (1973) explained resilience as the ability of systems to recover and continue functioning despite disturbances, while Folke et al. (2010) emphasized that resilient communities can adjust, learn, and adapt to environmental changes. On the other hand, Smit and Wandel (2006), along with Füssel (2007), focused on adaptation, examining how individuals and communities adjust their behaviors and livelihoods in response to climate-related risks and challenges.

The theory explains that communities with strong adaptive capacity are better able to respond to climate change through knowledge, access to resources, institutional support, and proactive actions. It also highlights that resilience and adaptation are interconnected, since adaptation helps strengthen resilience against environmental hazards and climate-related disruptions. Through this perspective, fisherfolks are viewed as active participants who develop strategies to cope with changing environmental conditions and protect their livelihoods.

This theory is highly relevant to the study because it provides a strong framework for understanding fisherfolks' awareness, preparedness, adaptation, and mitigation strategies regarding climate change. Since coastal communities are among the most vulnerable sectors, the theory helps explain how fisherfolks respond to climate-related challenges through sustainable practices and community participation. It also supports the study in examining how perceptions of climate change influence actions that contribute to resilience, environmental sustainability, and long-term livelihood security.

Objectives

This study aimed to determine the levels of adaptation and the use of mitigation strategies among fisherfolk in selected coastal barangays in Southern Negros during the Second Quarter of Calendar Year 2026. Specifically, this sought to determine: (1) the



profile of the respondents in terms of age, sex, and average family monthly income; (2) the fisherfolk's level of adaptation strategies on climate change in the areas of sustainable fishing practices, livelihood diversification, and community-based management; (3) the fisherfolk's level of mitigation strategies on climate change in the areas of sustainable fishing practices, livelihood diversification, and community-based management; (4) whether a significant difference exists in the fisherfolk's level of adaptation strategies on climate change when grouped according to the aforementioned variables; and (5) whether a significant difference exists in the fisherfolk level of mitigation strategies on climate change when grouped according to the aforementioned variables.

Methodology

This presents the methodologies used by the researcher. This specifically includes the research design, the study locale, the respondents, the data-gathering instrument, the validity and reliability of the research instrument, the data-gathering procedure, the analytical schemes, and the statistical tools.

Research Design

This paper used a descriptive research design to systematically describe the levels of adaptation and mitigation strategies for climate change in selected coastal barangays in Southern Negros during the Second Quarter of the Calendar year 2025, as a basis for an entrepreneurial development plan. According to McCombes (2019), descriptive research aims to accurately and systematically describe a population, situation or phenomenon. It can answer what, where, when and how questions, but not why questions. By using this design, the study can generate insights pertinent to policy and that represent the realities of the Negros Occidental fishing community.

Locale of the Study

The study was conducted in selected coastal barangays of a municipality in Southern Negros, located along western coast of the province and facing the Guimaras Strait. The area is known for its rich fishing and agricultural, with a significant number of households relying on small-scale fisheries as their main source of income and food security. Like other coastal communities, it is highly vulnerable to climate change impacts such as typhoons, storm surges, and seasonal monsoons, declining fish stocks.

This municipality is part of the Network of Alliances for Coastal Wetlands Conservation (NOCWAMA), which has gained national recognition for its sustainable coastal management initiatives. In 2021, the alliance received the Galing Pook Award, one of the most prestigious awards in the Philippines for outstanding local governance, in recognition of its effort in wetland protection, community-based conservation, and strengthening fisherfolk resilience (Del Carmen, 2021). Such recognition underscores



the municipality's commitment to both ecological sustainability and the welfare of its fishing communities.

Respondents

The respondents of the study were 178 fisherfolk residing in selected coastal barangays in Southern Negros. The respondents were chosen because they are directly dependent on marine resources and are highly vulnerable to the effects of climate change, including typhoons, monsoon disturbances, and declining fish stocks. This study utilized a stratified random sampling technique, which involves dividing a population into smaller subgroups, or strata. The strata are formed based on members' shared attributes or characteristics in stratified random sampling or stratification, such as income or educational attainment (Hayes, 2024). This approach was appropriate for the study because it enabled more effective comparison of the fisherfolks' mitigation and adaptation strategies when they were classified based on the identified variables.

Data Gathering Instrument

The primary data gathering instrument used in the study was a self-made questionnaire designed by the researcher based on the objectives of the study and related literature. The questionnaire consisted of two parts. Part I gathered the demographic profile of the respondents, including age, sex, and average family monthly income. Part II measured the fisherfolk's levels of adaptation and mitigation strategies on climate change in the areas of sustainable fishing practices, livelihood diversification, and community-based management. The questionnaire utilized a five-point Likert scale with the following interpretations: 5 (Always), 4 (Often), 3 (Sometimes), 2 (Rarely), and 1 (Almost Never). The results were recorded, analyzed, and treated to determine the fisherfolk's level of adaptation and mitigation strategies on climate change in the areas of sustainable fishing practices, livelihood diversification, and community-based management.

Instrument Validity and Reliability

Validity refers to the extent to which an instrument measures what it is designed to measure. For this study, four validators with doctoral-level qualifications and supervisory expertise conducted face and content validation, resulting in a score of 4.81, interpreted as *Excellent*. Their feedback ensured the questionnaire's relevance and appropriateness for assessing adaptation and mitigation strategies. Reliability was established through a pilot test with 30 fisherfolk from selected coastal barangays, analyzed using Cronbach's Alpha. The results showed high internal consistency, with indices of 0.712 for adaptation strategies (*good*) and 0.763 for mitigation strategies (*good*), confirming that the instrument is both valid and reliable for the study.

Data Gathering Procedure



The researcher started the data collection process by securing approval from the academic adviser and obtaining permission from the concerned authorities in the selected coastal barangays. After approval, the respondents were briefed about the purpose of the study, and their informed consent was obtained prior to participation. A self-made questionnaire, which has undergone expert validation and pilot testing, was administered personally to the 178 fisherfolk respondents identified through purposive sampling. The distribution was conducted during agreed-upon schedules, either in community centers or designated barangay areas, to ensure accessibility and convenience for the participants. Assistance was provided to respondents who may have difficulty reading or writing to ensure accuracy and inclusivity of responses. Once accomplished, the questionnaires were retrieved immediately to avoid loss or missing data. The responses were checked, encoded, and organized systematically. The gathered data were statistically processed using the Statistical Package for the Social Sciences (SPSS) software and statistical tools.

Research Ethics Protocol

The study was observed to strict ethical standards to make sure that the rights and welfare of fisherfolk are respected at all times. Before answering the questionnaire, the respondents were fully informed about the purpose of the study, how the data was used, and their voluntary participation was secured through informed consent. Confidentiality and anonymity were maintained by coding responses instead of using names. The questions are designed to ensure that they do not cause any harm or discomfort, and the respondents have the right to withdraw at any time without consequence. The data collected was only used for academic purposes, stored safely, and disposed of properly after the study. More importantly, the dignity and rights of participants were respected throughout the research process.

Analytical and Statistical Schemes

Objective No. 1 utilized a descriptive-analytical scheme using frequency and percentage distributions to determine the respondents' profiles in terms of age, sex, and average family monthly income. Objective No. 2 also utilized a descriptive-analytical scheme using mean to determine the fisher folk level of adaptation strategies on climate change in the areas of sustainable fishing practices, livelihood diversification, and community-based management. Objective No. 3 likewise utilized a descriptive-analytical scheme using mean to determine the fisherfolk's level of mitigation strategies on climate change in the areas of sustainable fishing practices, livelihood diversification, and community-based management. Objective No. 4 utilized a comparative-analytical scheme using the Mann-Whitney U test to determine whether a significant difference exists in the fisher folk level of adaptation strategies on climate change when grouped and compared according to the aforementioned variables. Objective No. 5 utilized a comparative-analytical scheme using the Mann-Whitney U test to determine whether a significant difference exists in the fisher folk level of



mitigation strategies on climate change when grouped and compared according to the aforementioned variables. Statistical tools included the mean for levels of adaptation and mitigation strategies, interpreted using a five-point scale ranging from very low to very high. These methods ensure systematic evaluation of data and provide accurate measures of adaptation and mitigation strategies.

Results and Discussions

This section presents the summary of the findings of the study based on the careful collection, analysis, and interpretation of data. From these findings, relevant conclusions were formulated to provide meaningful insights related to the study.

Table 1
Profile of the Respondents

Variables	Categories	Frequency	Percentage
Age	Younger (below 47 years old)	84	47.2
	Older (47 years old and above)	94	52.8
	Total	178	100.0
Sex	Male	121	68.0
	Female	57	32.0
	Total	178	100.0
Average Family Monthly Income	Lower (below Php19,800.00)	87	48.9
	Higher (Php19,800 and above)	91	51.1
	Total	178	100.0

Table 1 presents the respondents' profiles by age, sex, and average monthly family income. The respondents comprised 178 fisherfolk. The respondents were composed of 94 older fisher folk, or 52.8%, and 84 younger fisher folk, or 47.20%. It also showed that 121 or 68% were male fisher folks, and on the other hand, 57 or 32% were female. As for average family monthly income, 91 or 51.1% fisher folks have a higher income, while lower family monthly income fisher folk were 87 or 48.90%.

This study's results imply that the fisherfolk's level of adaptation and mitigation strategies on climate change in selected coastal barangays in Southern Negros for the Calendar Year 2026 were composed of older fisherfolk, dominated by male fisherfolk with higher family monthly income.

Descriptive Analysis of Fisherfolk's Level of Adaptation Strategies on Climate Change in Sustainable Fishing Practices, Livelihood Diversification, and Community-Based Management

Table 2
Fisher Folk Level of Adaptation Strategies on Climate Change in Sustainable Fishing Practices

Items	Mean	Interpretation
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<i>As a fisherfolk, my adaptation strategy is...</i>		
1. Modifying my fishing routes depending on water temperature changes.	3.20	Moderate
2. Using fishing gears that reduce damage to marine habitats.	3.52	High
3. Avoiding the harvesting of juvenile fish to sustain fish stocks.	2.88	Moderate
4. Maintaining my fishing equipment to withstand climate disturbances.	3.25	Moderate
5. Following local fishing regulations during extreme climate conditions.	3.61	High
6. Avoiding fishing during closed seasons to allow fish reproduction.	3.17	Moderate
Overall Mean	3.27	Moderate

Table 2 presents the level of adaptation strategies on climate change in the area of sustainable fishing practices. The overall mean score of 3.27 is interpreted as a moderate level. The highest mean score of 3.61, interpreted as a high level, is on item number 5, "following local fishing regulations during extreme climate conditions." On the other hand, item number 3, "avoiding the harvesting of juvenile fish to sustain fish stocks," has the lowest mean score of 2.88, which is interpreted as a moderate level.

This implies that long-term fish supply sustainability may be negatively influenced by fishers' lack of understanding or poor implementation of sustainable fishing techniques. Harvesting juvenile fish results in a decline of fish populations from reaching maturity and reproducing.

Supported by the study of Pauly and Zeller (2019), which stated that overfishing, especially for juvenile fish, significantly contributes to the decline of marine resources and threatens the sustainability of fisheries. Similarly, Churnpagdee et al. (2018) emphasized that unsustainable fishing practices, including catching juvenile fish, weaken ecosystem resilience and reduce the capacity of fisheries to recover from climate-related stress. This indicated that without proper regulation and awareness, fisherfolk may unintentionally contribute to resource decline despite their dependence on it for livelihood.

Table 3
Fisher Folk Level of Adaptation Strategies on Climate Change in Livelihood Diversification

Items	Mean	Interpretation
<i>As a fisherfolk, my adaptation strategy is...</i>		
1. Engaging in alternative livelihood activities during low fish catch.	2.84	Moderate
2. Participating in skills training to learn additional income sources.	1.94	Low
3. diversifying my fishing-related income by offering boat services.	2.62	Moderate
4. adopting aquaculture (e.g., seaweed, fish cages) as an alternative livelihood.	2.17	Low
5. Selling value-added fish products (e.g., dried fish, smoked fish).	3.69	High
6. Exploring small-scale entrepreneurship activities to support family needs.	3.74	High
Overall Mean	2.83	Moderate

Table 3 presents the level of adaptation strategies to climate change in the area of livelihood diversification. The overall mean score of 2.83 is interpreted as a moderate level. The highest mean score of 3.74, interpreted as high level, is on item number 6, "exploring small-scale entrepreneurship activities to support family needs." On the other



hand, item number 2, "participating in skills training to learn additional income sources," has the lowest mean score of 1.94, which is interpreted as low level.

This implies that fisher folks may have limited access to capacity-building programs or may lack awareness of alternative livelihood opportunities. Due to fisherfolk's dependence on a single source of income, like fishing, they are more vulnerable to economic and environmental shocks, which can make them more at risk from climate change.

Similar to the study of Allison and Ellis (2021), it stated that livelihood diversification is a crucial tactic for lowering vulnerability among families whose livelihood is fishing because it offers a backup source of income during times of low catch or bad weather. Moreover, communities with greater access to training, education, and skill development have a stronger ability to adopt diversified livelihoods. The low participation in skills training suggests that fisher folks may be prevented from creating additional sources of income by difficulties, including program availability, financial limitations, or low involvement in community projects (Cinner et al., 2018)

Table 4

Fisher Folk Level of Adaptation Strategies on Climate Change in Community-Based Management

Items	Mean	Interpretation
<i>As a fisherfolk, my adaptation strategy is...</i>		
1. Joining community discussions on climate-related issues.	2.31	Low
2. Participating in local marine conservation activities.	1.88	Low
3. helping implement barangay policies related to climate adaptation.	2.78	Moderate
4. Sharing traditional and local knowledge in community planning.	2.25	Low
5. Supporting barangay coastal resource management programs.	3.07	Moderate
6. Working with other fisherfolk to monitor local marine resources.	1.79	Low
Overall Mean	2.35	Low

Table 4 presents the level of adaptation strategies to climate change in the area of community-based management. The overall mean score of 2.35 is interpreted as a low level. The highest mean score of 3.07, interpreted as a moderate level, is on item number 5, "supporting barangay coastal resource management programs." On the other hand, item number 6, "working with other fisherfolk to monitor local marine resources," has the lowest mean score of 1.79, which is interpreted as low level.

This implies that a lack of cooperation and involvement in community-based management initiatives is indicated by the low participation in monitoring local maritime resources with other fisher folks. Fisher folks may be more prone to resource decline and the effects of climate change as a result, which could lessen the effectiveness of group efforts required to preserve and restore the maritime ecosystem.

Gutiérrez et al. (2019) state that better ecological results and more regulatory compliance depend on fishermen's active involvement in monitoring and managing



maritime resources. Similar to this, Pomeroy et al. (2020) stressed that whereas local participation enhances resource governance and encourages sustainable practices, community-based fisheries management significantly depends on collaboration and shared responsibility among those involved. Lack of involvement in monitoring operations could be a sign of problems that might hinder conservation efforts, such as insufficient knowledge, a lack of trust, or a lack of government support.

Descriptive Analysis of Fisherfolk’s Level of Mitigation Strategies on Climate Change in the Areas of Sustainable Fishing Practices, Livelihood Diversification, and Community-Based Management

Table 5
Fisher Folk Level of Mitigation Strategies on Climate Change in Sustainable Fishing Practices

Items	Mean	Interpretation
<i>As a fisherfolk, my mitigation strategy is...</i>		
1. Reducing fuel consumption by planning efficient fishing trips.	2.71	Moderate
2. Using environment-friendly fishing gear to lessen marine damage.	3.37	Moderate
3. Avoiding illegal fishing methods that contribute to ecosystem decline	3.91	High
4. Practicing proper waste disposal to prevent pollution at sea.	4.16	High
5. Minimizing the use of plastic during fishing operations.	3.92	High
6. Using renewable energy (e.g., solar lights) when possible.	3.58	High
Overall Mean	3.61	High

Table 5 presents the level of mitigation strategies on climate change in the area of sustainable fishing practices. The overall mean score of 3.61 is interpreted as a high level. The highest mean score of 3.92, interpreted as high level, is on item number 5, "minimizing the use of plastic during fishing operations." On the other hand, item number 1, "reducing fuel consumption by planning efficient fishing trips," has the lowest mean score of 2.71, which is interpreted as a moderate level.

This implies that it is possible that fisherfolk don't know much about energy-efficient strategies for fishing or don't have the means or expertise for implementing these techniques into practice. In addition to increasing operating expenses, inefficient fuel consumption raises carbon emissions, which may worsen the effects of climate change.

According to Tyedmers et al. (2018), increasing fuel efficiency is a crucial mitigation strategy in the fishing industry since fuel consumption is a major source of greenhouse gas emissions. In addition, Parker et al. (2018) stressed that minimizing unnecessary travel and optimizing fishing routes may significantly lower fuel consumption and operating costs while minimizing environmental impact. The lack of acceptance of this practice could point to obstacles like poor education, restricted access to technology, such as navigational equipment, or a lack of knowledge about its advantages for the environment and the economy.



Table 6

Fisher Folk Level of Mitigation Strategies on Climate Change in Livelihood Diversification

Items	Mean	Interpretation
<i>As a fisherfolk, my mitigation strategy is...</i>		
1. engaging in livelihoods that reduce dependence on overfished marine areas.	3.38	Moderate
2. Supporting eco-friendly small enterprises to lessen fishing pressure.	3.06	Moderate
3. Learning sustainable aquaculture techniques to reduce extraction from the sea.	2.52	Moderate
4. producing value-added goods that require fewer marine resources.	2.74	Moderate
5. Joining livelihood cooperatives that promote sustainable practices.	2.39	Low
6. Participating in environment-focused entrepreneurship programs.	2.08	Low
Overall Mean	2.69	Moderate

Table 6 presents the level of mitigation strategies on climate change in the area of livelihood diversification. The overall mean score of 2.69 is interpreted as a moderate level. The highest mean score of 3.38, interpreted as a moderate level, is on item number 1, "engaging in livelihoods that reduce dependence on overfished marine areas." On the other hand, item number 6, "participating in environment-focused entrepreneurship programs," has the lowest mean score of 2.08, which is interpreted as a low level.

This implies that fisherfolk are unaware of or have restricted access to sustainable livelihood alternatives that combine income-generating with preserving the environment. Their capacity to improve their economic resilience and mitigate climate change may be hindered by their lack of involvement.

According to the study of Cinner et al. (2018), livelihood diversification, including sustainable activities, can lessen the burden on maritime resources and promote the long-term health of ecosystems. Likewise, Allison and Ellis (2021) stressed that sustainable alternative livelihoods, such as eco-tourism, aquaculture, or green businesses, might lessen reliance on fishing while promoting environmental preservation. The poor involvement in these programs could be a sign of challenges such as a lack of funding, a lack of training opportunities, or a lack of institutional support for green entrepreneurship.

Table 7

Fisher Folk Level of Mitigation Strategies on Climate Change in Community-Based Management

Items	Mean	Interpretation
<i>As a fisherfolk, my mitigation strategy is...</i>		
1. Participating in community efforts to reduce carbon emissions.	2.83	Moderate
2. Promoting reforestation and mangrove rehabilitation.	2.43	Low
3. helping enforce marine protected areas in our barangay.	3.14	Moderate
4. Supporting local ordinances that protect coastal ecosystems.	3.15	Moderate
5. Joining community campaigns against waste dumping in coastal areas.	3.58	High



6. Collaborating with barangay leaders on climate mitigation activities.	2.90	Moderate
Overall Mean	3.00	Moderate

Table 7 presents the level of mitigation strategies on climate change in the area of community-based management. The overall mean score of 3.00 is interpreted as a moderate level. The highest mean score of 3.58, interpreted as a high level, is on item number 5, "joining community campaigns against waste dumping in coastal areas." On the other hand, item number 2, "promoting reforestation and mangrove rehabilitation," has the lowest mean score of 2.43, which is interpreted as low level.

This implies that fisherfolk have limited involvement in promoting reforestation and mangrove rehabilitation. This could lessen the ability of marine ecosystems to absorb carbon and sustain fisheries productivity, as well as compromise the natural protection of coastal areas. Because they operate as carbon sinks and protect shorelines from erosion and storm surges, mangroves are essential to mitigating climate change.

According to the study of Alongi (2018), mangrove ecosystems are among the best places to store carbon, and consequently, protecting and restoring them is crucial for addressing climate change. Similarly, Primavera et al. (2019) emphasized that mangrove rehabilitation improves fish habitats and sustains the livelihoods of coastal communities in addition to helping to mitigate climate change. The low level of participation in these activities could be a sign of a lack of institutional support for conservation initiatives, a lack of community involvement, or awareness gaps.

Comparative Analysis in the Fisher Folk Level of Adaptation Strategies on Climate Change in the Areas of Sustainable Fishing Practices, Livelihood Diversification, and Community-Based Management When Compared According to Age, Sex, and Average Family Monthly Income

Table 8
Difference in Fisher Folk Level of Adaptation Strategies on Climate Change in the Areas of Sustainable Fishing Practices When Grouped and Compared According to Variables

Variable	Category	N	Mean Rank	Mann-Whitney U-Test	p-value	Sig. level	Interpretation
Age	Younger	84	92.68	3680.5	0.431	0.05	Not Significant
	Older	94	86.65				
Sex	Male	121	91.12	3253.0	0.538	0.05	Not Significant
	Female	57	86.07				
Average Family Monthly Income	Lower	87	82.97	3390.5	0.095	0.05	Not Significant
	Higher	91	95.74				



Table 8 shows the Difference in Fisher Folk Level of Adaptation Strategies on Climate Change in the Areas of Sustainable Fishing Practices When Grouped and Compared According to Variables. On age, the younger category got a mean rank score of 92.68, while the older category got a mean rank score of 86.65; both have a p-value of 0.431 with a significance level of 0.05, interpreted as not significant.

Moreover, on sex, the male category got a mean rank score of 91.12, while the female category got a mean rank score of 86.07; both have a p-value of 0.538, with a significance level of 0.05 interpreted as not significant. Furthermore, on average family monthly income, the lower category got a mean rank score of 82.97, while the higher category got a mean rank score of 95.74, both has p-value of 0.095 with significance level of 0.05, interpreted as not significant.

The result of the study suggests that age, sex, and average family monthly income do not influence the Fisher Folks' Level of Adaptation Strategies on Climate Change in the Areas of Sustainable Fishing Practices When Grouped and Compared According to Variables. Thus, the null hypothesis, which states that "There is no significant difference in the level of adaptation strategies on climate change of fisherfolk when grouped and compared according to the aforementioned variable," is accepted.

Recent studies on small-scale fisheries and climate change adaptation show that participation in sustainable fishing practices is often community-based and similar among fisherfolk regardless of age, sex, or income. Since fisherfolk share the same environment, regulations, and livelihood challenges, they tend to practice similar adaptation strategies. Jentoft and Chuenpagdee (2022) explained that sustainable fishing practices, such as following fishing regulations and participating in conservation activities, are commonly guided by community-based management systems that involve all members of the fishing community. This supports the present study's finding that age does not significantly influence adaptation strategies in sustainable fishing practices.

Similarly, Adger et al. (2023) stated that adaptation behaviors are more influenced by shared experiences, environmental risks, and community cooperation than by gender differences. Both male and female fisherfolk are affected by climate change and often participate equally in sustainable fishing and conservation efforts. This supports the study's finding that sex does not significantly affect sustainable fishing adaptation strategies. Furthermore, Allison et al. (2022) emphasized that sustainable fishing practices are usually implemented through community rules and monitoring systems that apply equally to all fisherfolk, regardless of income level.



Likewise, Lasco et al. (2022) noted that government programs and community-based initiatives encourage collective participation in environmental conservation and sustainable fishing. These studies support the present findings that age, sex, and average family monthly income do not significantly influence fisherfolk adaptation strategies in sustainable fishing practices because these activities are shaped by shared responsibility and community participation.

Table 9
Difference in Fisher Folk Level of Adaptation Strategies on Climate Change in the Areas of Livelihood Diversification When Grouped and Compared According to Variables

Variable	Category	N	Mean Rank	Mann-Whitney U-Test	p-value	Sig. level	Interpretation
Age	Younger	84	90.22	3887.5	0.859	0.05	Not Significant
	Older	94	88.86				
Sex	Male	121	89.01	3389.0	0.852	0.05	Not Significant
	Female	57	90.54				
Average Family Monthly Income	Lower	87	90.45	3786.0	0.809	0.05	Not Significant
	Higher	91	88.59				

Table 9 shows the Difference in Fisher Folk Level of Adaptation Strategies on Climate Change in the Areas of Livelihood Diversification When Grouped and Compared According to Variables. On age, the younger category got a mean rank score of 90.22, while the older category got a mean rank score of 88.86; both have a p-value of 0.859 with a significance level of 0.05, interpreted as not significant.

Moreover, on sex, the male category got a mean rank score of 89.01, while the female category got a mean rank score of 90.54; both have a p-value of 0.852, with a significance level of 0.05 interpreted as not significant. Furthermore, on average, the family monthly income in the lower category got a mean rank score of 90.45, while the higher category got a mean rank score of 88.59; both have a p-value of 0.809 with a significance level of 0.05, interpreted as not significant.

The result of the study suggests that age, sex, and average family monthly income do not influence the Fisher Folks' Level of Adaptation Strategies on Climate Change in the Areas of Livelihood Diversification When Grouped and Compared According to Variables. Thus, the null hypothesis, which states that "There is no significant difference in the level of adaptation strategies on climate change of



fisherfolk when grouped and compared according to the aforementioned variable," is accepted.

Research shows that both younger and older fisherfolk often participate similarly in livelihood diversification strategies because they experience the same environmental and economic challenges. Allison et al. (2022) explained that activities such as aquaculture, small businesses, seasonal jobs, and other alternative livelihoods are commonly adopted by fishing communities to cope with declining fish catch, climate change, and financial difficulties.

This supports the present study's finding that age does not significantly influence fisherfolk adaptation strategies in livelihood diversification. Similarly, gender differences may not greatly affect participation in livelihood diversification activities. Adger et al. (2023) stated that fishing households usually work together in responding to climate-related challenges, with both men and women contributing to income-generating activities. Since livelihood decisions are often made collectively within households, male and female fisherfolk tend to show similar levels of participation in diversification strategies.

This supports the study's finding that sex does not significantly influence livelihood diversification strategies. Furthermore, Jentoft and Chuenpagdee (2022) emphasized that livelihood diversification opportunities are often supported by community organizations, cooperatives, and local institutions, making them accessible to fisherfolk regardless of income level. Likewise, Lasco et al. (2022) noted that government and community programs such as aquaculture, tourism, and small enterprise projects encourage participation from different socio-economic groups. These studies support the present finding that average family monthly income does not significantly influence fisherfolk participation in livelihood diversification strategies.

Table 10

Difference in Fisher Folk Level of Adaptation Strategies on Climate Change in the Areas of Community-Based Management When Grouped and Compared According to Variables

Variable	Category	N	Mean Rank	Mann-Whitney U-Test	p-value	Sig. level	Interpretation
Age	Younger	84	95.24	3466.0	0.158		Not Significant
	Older	94	84.37				
Sex	Male	121	89.73	3421.0	0.931	0.05	Not Significant
	Female	57	89.02				
Average Family Monthly Income	Lower	87	92.21	3723.0	0.491		Not Significant
	Higher	91	86.91				



Table 10 shows the difference in the fisherfolk's level of adaptation strategies on climate change in the areas of community-based management when grouped and compared according to variables. Regarding age, the younger category got a mean rank score of 95.24, while the older group got a mean rank score of 84.37; both have a p-value of 0.158, with a significance level of 0.05 interpreted as not significant. On sex, the male category got a mean rank score of 89.73, while the female category got a mean rank score of 89.02; both have a p-value of 0.931 with a significance level of 0.05 interpreted as not significant. Furthermore, on average, the family monthly income in the lower category got a mean rank score of 92.21, while the higher category got a mean rank score of 86.91; both have a p-value of 0.491, with a significance level of 0.05 interpreted as not significant.

The result of the study suggests that age, sex, and average family monthly income do not influence the Fisher Folk Level of Adaptation Strategies on Climate Change in the Areas of Community-Based Management When Grouped and Compared According to Variables. Thus, the null hypothesis, which states that "There is no significant difference in the level of adaptation strategies on climate change of fisherfolk when grouped and compared according to the aforementioned variable," is accepted.

Studies show that participation in community-based environmental management is generally similar among younger and older fisherfolk because fisheries management depends on cooperation within the community. Jentoft and Chuenpagdee (2022) explained that activities such as coastal resource monitoring, following fishing regulations, and participating in conservation programs involve all community members since marine resources are important to everyone. Likewise, Adger et al. (2023) stated that climate adaptation behaviors are more influenced by shared risks, social networks, and community support than by age or gender differences. Both men and women often work together in fisheries-related activities and environmental management, which explains why there is no significant difference in their adaptation strategies.

Furthermore, Allison et al. (2022) emphasized that community-based fisheries management programs encourage participation from all households regardless of income level through inclusive governance and local institutions. Similarly, Lasco et al. (2022) highlighted that community-based adaptation programs in coastal communities focus on cooperation, local participation, and shared responsibility in protecting marine resources. These studies support the present finding that age, sex, and average family monthly income do not significantly influence fisherfolk adaptation strategies in community-based management because participation is commonly driven by collective community efforts.

Comparative Analysis in the Fisher Folk Level of Mitigation Strategies on Climate Change in the Areas of Sustainable Fishing Practices, Livelihood Diversification, and Community-Based Management When Compared According to Age, Sex, and Average Family Monthly Income



Table 11

Difference in Fisher Folk Level of Mitigation Strategies on Climate Change in the Areas of Sustainable Fishing Practices When Grouped and Compared According to Variables

Variable	Category	N	Mean Rank	Mann-Whitney U-Test	p-value	Sig. level	Interpretation
Age	Younger	84	87.64	3791.5	0.645	0.05	Not Significant
	Older	94	91.16				
Sex	Male	121	87.11	3159.0	0.362	0.05	Not Significant
	Female	57	94.58				
Average Family Monthly Income	Lower	87	81.11	3228.5	0.032	0.05	Not Significant
	Higher	91	97.52				

Table 11 shows the difference in the fisherfolk's level of mitigation strategies on climate change in the areas of sustainable fishing practices when grouped and compared according to variables. Regarding age, the younger category got a mean rank score of 87.64, while the older category got a mean rank score of 91.16; both have a p-value of 0.645, with a significance level of 0.05, interpreted as not significant. On Sex, the male category got a mean rank score of 87.11, while the female category got a mean rank score of 94.58; both have a p-value of 0.362, with a significance level of 0.05 interpreted as not significant. Moreover, on average, family monthly income, the lower category got a mean rank score of 81.11, while the higher category got a mean rank score of 97.52; both have a p-value of 0.032, with a significance level of 0.05 interpreted as significant.

The result of the study suggests that age and sex do not influence the fisher folks' level of mitigation strategies on climate change in the areas of sustainable fishing practices when grouped and compared according to variables. Thus, the null hypothesis, which states that "There is no significant difference in the level of mitigation strategies on climate change of fisherfolk when grouped and compared according to the aforementioned variable," is accepted.

Moreover, on average, family monthly income, the result of the study suggests that it influences the fisher folks' level of mitigation strategies on climate change in the areas of sustainable fishing practices when grouped and compared according to variables. Thus, the null hypothesis, which states that "There is no significant difference in the level of mitigation strategies on climate change of fisherfolk when grouped and compared according to the aforementioned variable," is rejected.



Table 12

Difference in Fisher Folk Level of Mitigation Strategies on Climate Change in the Areas of Livelihood Diversification When Grouped and Compared According to Variables

Variable	Category	N	Mean Rank	Mann-Whitney U-Test	p-value	Sig. level	Interpretation
Age	Younger	84	91.80	3754.5	0.571	0.05	Not Significant
	Older	94	87.44				
Sex	Male	121	91.44	3213.5	0.462	0.05	Not Significant
	Female	57	85.38				
Average Family Monthly Income	Lower	87	91.02	3826.5	0.700	0.05	Not Significant
	Higher	91	88.05				

Table 12 shows the difference in the fisherfolk's level of mitigation strategies on climate change in the areas of livelihood diversification when grouped and compared according to variables. Regarding sex, the younger category got a mean rank score of 91.80, while the older category got a mean rank score of 87.44; both have a p-value of 0.571 and a significance difference of 0.05, interpreted as not significant. However, on sex, the male category got a mean rank score of 91.44, while the female category got a mean rank score of 85.38, both have a p-value of 0.462, with a significance level of 0.05, interpreted as not significant. Moreover, on the average family monthly income, the lower category got a mean rank score of 91.20, while the higher category got a mean rank score of 88.05; both have a p-value of 0.700 and a significance level of 0.05, interpreted as not significant.

The result of the study suggests that age, Sex, and Average Family Monthly Income do not influence the fisher folk's level of mitigation strategies on climate change in the areas of livelihood diversification when grouped and compared according to variables. Thus, the null hypothesis, which states that "There is no significant difference in the level of mitigation strategies on climate change of fisherfolk when grouped and compared according to the aforementioned variable," is accepted.

Jentoft and Chuenpagdee (2022) explained that small-scale fishing communities often develop collective responses to environmental challenges because they depend on the same marine resources for their livelihood. Similarly, Adger et al. (2023) emphasized that climate adaptation and mitigation behaviors are influenced more by shared risks, social support, and community systems than by demographic factors such as age, sex, or income. As a result, fisherfolk from different backgrounds tend to participate similarly in livelihood diversification and climate-related strategies.

Furthermore, Allison et al. (2022) stated that livelihood diversification is commonly practiced as a shared survival strategy among fisherfolk communities facing



declining fish stocks and climate-related risks. Likewise, Lasco et al. (2022) highlighted that coastal communities in Southeast Asia often respond collectively to environmental pressures through shared adaptation and mitigation practices, resulting in minimal differences across demographic groups.

Table 13
Difference in Fisher Folk Level of Mitigation Strategies on Climate Change in the Areas of Community-Based Management When Grouped and Compared According to Variables

Variable	Category	N	Mean Rank	Mann-Whitney U-Test	p-value	Sig. level	Interpretation
Age	Younger	84	91.11	3812.5	0.690	0.05	Not Significant
	Older	94	88.06				
Sex	Male	121	93.90	2915.5	0.093	0.05	Not Significant
	Female	57	80.15				
Average Family Monthly Income	Lower	87	85.02	3568.5	0.252	0.05	Not Significant
	Higher	91	93.79				

Table 13 shows the difference in the fisherfolk's level of mitigation strategies on climate change in the areas of community-based management when grouped and compared according to variables. On age, the younger category got a mean rank score of 91.11, while the older category got a mean rank score of 86.06; both have a p-value of 0.690, and a significance level of 0.05 interpreted as not significant. On the other hand, on sex, the male category got a mean rank score of 93.90, while the female category got a mean rank score of 80.15, both have a p-value of 0.093, and a significance level of 0.05 interpreted as not significant. Furthermore, on Average Family Monthly Income, the lower category got a mean rank score of 85.02, while the higher category got a mean rank score of 93.79, both have a p-value of 0.252 and a significance level of 0.05 interpreted as not significant.

The result of the study suggests that Age, Sex, and Average Family Monthly Income do not influence the Fisher Folks' Level of Mitigation Strategies on Climate Change in the Areas of Community-Based Management When Grouped and Compared According to Variables. Thus, the null-hypothesis, which says that "There is no significant difference in the level of mitigation strategies on climate change of fisherfolk when grouped and compared according to the aforementioned variable," is accepted.

Lasco et al. (2022) explained that climate adaptation and mitigation practices in coastal communities are commonly influenced by shared livelihood challenges and collective community action rather than demographic differences. Since fisherfolk rely on the same marine resources and face similar environmental risks, they often



participate similarly in conservation and mitigation activities. Likewise, Adger et al. (2023) emphasized that community norms, shared experiences, and social learning play an important role in shaping environmental behaviors, resulting in similar climate responses among fisherfolk regardless of age, sex, or income.

Similarly, Chuenpagdee and Jentoft (2022) noted that fisherfolk communities often show similar participation in climate mitigation and resource management activities because of community-based fisheries governance and shared stewardship practices. Furthermore, Jentoft et al. (2022) explained that environmental participation is more influenced by cooperative management systems and collective decision-making than by individual demographic characteristics, leading to minimal differences in climate response strategies among fisherfolk.

Conclusion

The study concluded that fisherfolk in selected coastal barangays in Southern Negros exhibit moderate to high levels of adaptation and mitigation strategies on climate change. Sustainable fishing practices were the most practiced strategies among respondents, while community-based management and participation in entrepreneurial and environmental programs remained limited.

The findings further revealed that demographic variables such as age, sex, and average family monthly income did not significantly influence the respondents' adaptation and mitigation strategies. This indicates that climate-related challenges are commonly experienced across fisherfolk communities.

The study highlights the importance of strengthening climate-resilient and entrepreneurial programs that focus on sustainable fishing practices, livelihood diversification, community participation, and environmental conservation. Government agencies, local government units, and fisheries organizations may utilize the findings as a basis for developing training programs and support initiatives that enhance the resilience and sustainability of coastal communities.

Future studies may focus on evaluating the effectiveness of climate adaptation programs, entrepreneurial interventions, and community-based environmental initiatives among fisherfolk communities in other coastal areas.

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