



A Phenomenological Study of the Lived Experiences of Fishermen about the Climate Change in Panabo City

Artocilla PERP¹, Bainteculo AJC¹ and Allawan JGL^{2*}

¹Department of Teachers Education, UM Panabo College, Philippines

²Department of Teachers Education, UM Panabo College, Philippines

*Corresponding author: Jovany Gleen L Allawan, Department of Teachers Education, UM Panabo College, Panabo City, Philippines, Email: jovany.allawan@umindanao.edu.ph

Research Article

Volume 8 Issue 2

Received Date: March 06, 2024

Published Date: May 01, 2024

DOI: [10.23880/ijoac-16000308](https://doi.org/10.23880/ijoac-16000308)

Abstract

Climate change has emerged as a crucial worldwide concern affecting a wide range of sectors, and coastal communities in particular face special challenges due to their reliance on marine resources. The purpose of this phenomenological study is to investigate the lived experiences of fishermen in Panabo City, a coastal town in the Philippines, with regard to the consequences of climate change on their livelihoods and way of life. The study investigates fishermen's resilience and efforts to seek other livelihood options in the face of climate uncertainty. Participants emphasize the importance of better assistance and interventions from government agencies, non-governmental organizations, and other stakeholders in order to develop adaptive capacity and foster community resilience. Six participants were interviewed in depth, and the data was recorded. Thematic analysis was employed in analyzing the data. The findings of this study highlight the urgent need for increased environmental awareness among fishermen in Panabo City. This study contributes to the broader discourse on climate resilience and community adaptation in coastal regions by examining fishermen's lived experiences in the context of climate change.

Keywords: Climate Change; Phenomenology; Thematic Analysis; Fishermen

Introduction

Climate change has emerged as one of the most critical global issues of our time, with far-reaching consequences for ecosystems and human livelihoods across the globe. The fishing industry is at the forefront of the industries impacted by altering environmental conditions, as it faces the most significant disruptions. Fishermen, as critical stakeholders in this domain, are witnesses to the changing dynamics and are in a unique position to provide valuable insights into the effects of climate change on their daily lives [1,2].

Southeast Asia is one of the most vulnerable regions to climate change due to its long coastlines, substantial

dependence on seasonal patterns of the monsoon, high population and economic activity concentration in coastal areas, and heavy reliance on agriculture, fisheries, forestry, and other natural resources [1,3]. According to Sutherland, et al. [2] multiple indices rank the Philippines as one of the countries most affected by extreme climate events. Aquatic resources are one of the impacted areas by climate change. According to Tewabe D [3] climate change may affect fisheries and aquaculture directly by influencing the abundance and distribution of fish stocks and the global supply of fish for consumption, or indirectly by influencing fish prices or the cost of goods and services required by fishers and fish farmers [4].

Warming is the most obvious and well-documented impact of climate change on the ocean. Ocean surface waters have warmed on average $1.3^{\circ} \pm 0.1^{\circ}\text{F}$ ($0.7^{\circ} \pm 0.08^{\circ}\text{C}$) per century globally between 1900 and 2016, and more than 90% of the extra heat linked to carbon emissions is contained in the ocean. These warming impacts sea levels, ocean circulation, stratification such as density contrast between the surface and deeper waters, productivity, and, ultimately, entire ecosystems [4-6].

Moreover, according to the research of McLachlan, et al. [1] as ocean temperatures rise, certain fish species will move to waters with lower temperatures. Coastal communities are put in danger at an unprecedented degree by rising sea levels. Changing sea temperature and current flows will bring shifts in the distribution of marine fish stocks, with some areas benefiting while others lose. In fact, climate change is seen to have an effect on the fisheries sector of highly fish-dependent yet vulnerable countries such as the Philippines in terms of food production, security, and livelihood [7]. This is the case because the Philippines is heavily dependent on fish. The country's fishery industry is severely impacted by the effects of climate change and is vulnerable to the dangers observed throughout Southeast Asia (SEA) [8].

Climate changes to the marine environment will come in many forms. For instance, the diversity of some temperate ecosystems is expected to increase. But overall, climate change is projected to disrupt marine ecosystems in ways that reduce the services they provide and their diversity of life. Climate change is also affecting the timing of seasonal events, which can affect fisheries. For example, some species, such as striped bass, are spawning earlier in the year. This means that catches can peak earlier than normal.

Fisheries will need to adapt to such changes or risk reduced catches and lost revenues, which can also increase prices for consumers [9].

According to Griffis E [10], changes in temperature cause fish populations to move to different places. As a result of warming oceans, some fish species may move to cooler areas or move away from traditional fishing grounds. This is a problem for fishermen who depend on certain species for their catch because they may need to change their fishing methods, gear, or target different species to keep making a living.

The effects of climate change on fisheries are a major concern for fishing nations, particularly the Philippines. The Philippines is extremely susceptible to the effects of climate change on fisheries, which can cause an economic disruption to the nation's economy [11]. Climate change is a pressing

issue that affects the entire planet. The Earth's temperature has been rising steadily over the past century, and this is largely due to human activities such as burning fossil fuels and deforestation. Accordingly, the study by Santos MD, et al. [4] has revealed that the effect of climate change on Philippine marine capture fisheries is projected to result in a decrease in fisheries GDP by 9% and 18% under mitigation and extreme scenarios, respectively. These effects may also lead to a reduction in household income by 0.36% and 0.38% for urban and rural households, respectively.

Fish is a widely traded food item and an essential source of cash income for many poor households. Fish can stimulate local market economies and be a significant source of foreign exchange. Fishing is frequently an integral component of diversified subsistence strategies, in which people take advantage of seasonal stock availability or rely on fishing when other means of food production and income generation are insufficient [11].

Moreover, Robitzski D [7] stated that 60% of the world's fish species at risk of extinction due to climate change. New research suggests that climate change threatens to wipe out significantly more species of fish than previously thought. If average global temperatures rise by five degrees Celsius — that'd be a global warming nightmare scenario — then New Scientist reports that 60 percent of all fish species could go extinct by the year 2100. It's grim news, as previous studies predicted that fish would be far more resilient. Marine fishing in the Philippines is more than an industry; it is a way of life. With 7,100 islands, the Philippines has the world's longest discontinuous coastline. Over a million Filipinos are engaged in marine fishing [11]. Millions of people in the Philippines rely on fishing for food and livelihoods. The contribution of the Philippine fishing industry to the country's Gross Domestic Products (GDP) was 2.3% and 4.3% at current and constant prices, respectively. Climate stressors—including rising sea temperatures, sea-level rise, and extreme weather events— as well as associated ocean acidification, have reduced fish catch, degraded marine resources, and impacted fishing communities [9,10].

The most recent scientific studies have confirmed that the warming of the climate system since the middle of the 20th century is most likely caused by humans. This is because humans are increasing the amount of greenhouse gases in the air, such as by burning fossil fuels and changing how land is used.

When fossil fuels are burned, huge amounts of carbon dioxide, a greenhouse gas, are released into the atmosphere. Greenhouse gases cause global warming by trapping heat in the atmosphere (United Nations, n.d.-c).

The average global temperature has already risen 1C. Warming above 1.5°C endangers additional sea level rise, extreme weather, biodiversity loss, and extinction of species (Fossil Fuels and Climate Change: The Facts, 2023). Ocean play a major role in climate dynamics: 83% of the global carbon cycle is circulated through the oceans. They have absorbed 93% of the excess heat from greenhouse gas emissions since the 1970s. The oceans are also home to between 500,000 and 10 million marine species, contributing enormously to the biodiversity of our planet.

Given their importance to the planet, it's vital we manage the oceans in a sustainable way. Changes to the ocean mean changes to fish stocks. To manage fishing sustainably requires adapting to whatever issues climate change brings. These changes are impacting marine life. Sudden rises in temperature and acidification can lead to the loss of marine habitats and species. Shifting ocean currents and warming waters are changing the distribution of fish stocks and altering the structure of ecosystems.

Climate change is not just an environmental issue, but comes with a whole raft of social issues, including displacement of communities, food security, water shortages and health-related issues [12]. Climate change has already had a significant impact on ocean and marine ecosystems. In addition to sea levels rising and increases in the frequency and intensity of extreme weather events, ocean warming, and ocean acidification have disrupted the chemistry of the ocean's water and resulted in the destruction of coral reefs as well as the active depletion of the abundance and distribution of marine life in coastal areas, in the open ocean and at the sea floor.

However, there is limited research on the lived experiences of fishermen in relation to climate change. Specifically, there is a research gap on the subjective perspectives of fishermen on the effects of climate change on their livelihoods, families, and communities. This study aims to address this gap by exploring the lived experiences of fishermen regarding climate change in specific geographic locations. Therefore, this study aims to address the research gap by exploring the phenomenological perspective of the fishermen in Panabo City, Philippines. According to the research of Oluowo J [5], changes in ocean dynamics could lead to changes in migration patterns of fish and possibly reduce fish landings, especially in coastal fisheries. Change impacts to ocean ecosystems are altering the distribution and abundance of fish populations and impacting the people [13].

Research that draws from a variety of fields, including the natural sciences, social sciences, and humanities, is

required because climate change is a phenomenon that is both complicated and multifaceted. These types of studies can combine socio-economic data on the experiences, views, and responses of fishermen with ecological data on changes in fish stocks, oceanographic conditions, and climatic trends. Through the use of an integrated approach, a more thorough understanding of the linkages between climate change and fishing communities can be achieved [6].

Climate changes to the marine environment will come in many forms. For instance, the diversity of some temperate ecosystems is expected to increase. But overall, climate change is projected to disrupt marine ecosystems in ways that reduce the benefits they provide and their diversity of life [10]. This study aims to provide in-depth knowledge on the lived experiences of fishermen regarding climate change in Panabo City. The study will contribute to the existing literature by exploring the social and economic impacts of climate change on the fishing industry. It will also provide insights into the coping mechanisms and adaptation strategies used by local fishermen to address the challenges imposed by climate change. The study's findings can be used as a basis for policymaking and practices that can better support the resilience of fishing communities in the face of climate change.

Literature can provide a nuanced depiction of the human dimensions of climate change and enable readers to emotionally empathize with the characters. This humanization of climate change impacts can generate empathy, comprehension, and a sense of urgency in readers, prompting them to consider their own role in combating climate change. It allows researchers to depict the intricate relationship between humans and nature, highlighting the dependence of fishing communities on healthy marine ecosystems and explore the moral dilemmas faced by fishing communities, policymakers, and society at large, offering thought-provoking narratives that challenge readers to critically reflect on their own ethical responsibilities towards the environment and vulnerable communities. By incorporating these experiences into literary works, researchers can inspire readers to develop a deeper appreciation for the natural world and to consider the environmental consequences of human activities.

Climate change has a direct effect on fishermen because it affects the marine areas they depend on for their jobs. By understanding their experiences, we can learn about the changes they have seen over time and make crucial changes. This knowledge can help the people understand the specific effects of climate change on fish stocks, fishing patterns, and the marine environment as a whole. By looking at what fishermen have done in the past, people can learn about the

methods they use to deal with the effects of climate change.

According to the study of Chapin, et al. fishermen often learn how to deal with shifts in fish distribution, changes in water temperature, changes in fish movement patterns, and other changes in the environment. By writing down and analyzing these adaptation tactics, policymakers, researchers, and other interested parties can learn about the best ways to build resilience. Involving fishermen in climate change research and decision-making can help build community involvement and give local stakeholders more power. By recognizing and valuing their experiences, fishermen are more likely to take part in group efforts to stop climate change. This participatory approach can help fishing communities co-produce knowledge and make interventions more successful.

The research on the lived experiences of fishermen gives a voice to marginalized communities, particularly those in developing countries or marginalized regions. By understanding and documenting their experiences, this research raises awareness about their challenges and empowers them to participate in decision-making processes. This study makes people more aware of their problems and gives them the power to take part in making decisions. It makes sure that the views and needs of fishing communities are taken into account when policy is being made, resources are being managed, and adaptation plans are being made.

People can acquire insight into the social, economic, and environmental elements that affect their livelihoods and well-being by coming to understand their experiences and how those experiences have shaped their lives. This information can be used to develop policies and interventions that encourage sustainable fishing practices, conserve marine ecosystems, and improve the lives of fishermen and the communities they live in. In addition, the research has the potential to make a contribution to the larger fields of anthropology and sociology by offering a detailed and nuanced comprehension of the cultural practices, beliefs, and values held by Filipino fisherman.

These advantages are anticipated to be met by policymakers, to make informed decisions about policies and regulations that affect the industry. The researchers, to use the findings to further explore the topic and develop new insights. Organizations working in the fishing industry, to use the information to improve working conditions and support the livelihoods of fishermen. However, it is important to note that the specific beneficiaries may vary depending on the scope and focus of the study.

The study of fishermen's actual experiences with climate change has social value by empowering communities, promoting social justice, enhancing resilience, nurturing community engagement, preserving cultural heritage, and informing the public. By amplifying the perspectives and experiences of fishing communities, this research contributes to the development of more inclusive, equitable, and sustainable responses to the challenges posed by climate change.

Method

Participants

The participants were selected from a coastal village in Barangay Cagangohan, Panabo City, Davao del Norte Philippines. The six informants were the subsistence fishermen who depend on their livelihood in fishing for at least one year. Participants were gain some practical knowledge and familiarity with the topic.

Materials and Instruments

The study employed the qualitative design through face-to-face interviews. The researchers used a semi-structured interview guide questionnaire as an instrument for this research study to gather information from significant fishermen who have experienced climate change. A semi-structured interview has been utilized for accomplishing a 'conversation with a purpose. According to George, it is a data collection method that relies on asking questions within a predetermined thematic framework utilizing a conversational flow to gather more information. However, the questions are not set in order or in phrasing. In research, semi-structured interviews are often qualitative in nature.

They are generally used as an exploratory tool in marketing, social science, survey methodology, and other research fields. This method gives the researcher the freedom to probe the interviewee to elaborate or to follow a new line of inquiry introduced by what the interviewee is saying. Semi-structured interviews also allow informants the freedom to express their views in their own terms. It is the intention to gain fishermen's perceptions, perspectives, and understandings of their life experiences as they have been facing climate change. The data were interpreted through phenomenological thematic analysis to scrutinize correctly how the participants seriously expressed their experience.

Design and Procedure

The researchers developed an interview guide exploring the lived experiences of fishermen whose livelihood was

affected by climate change. The instrument was scrutinized by an expert. A letter of consent was secured and signed by the respondents. The informants that were selected are those whose fishing is the main source of their livelihood, and they are residents in the coastal area.

Data for the study were derived from several open-ended questions, which were designed to probe participants' perceptions about their lived experiences about the climate change such as: (1) What are the lived experiences of fishermen facing climate change? (2) What coping mechanisms have fishermen developed to deal with the changes in the environment? (3) What are the insights and hopes of fishermen in relation to changes in environment? The researchers guarantee that without the participants'

prior approval, the sensitive information in this document won't be utilized for any reason other than the evaluation or execution of the investigation.

Results and Discussion

This section of the study shows the results using tables followed by discussions based on the results of the study. The items in the table have been analyzed, categorized, and arranged according to themes that were composed of different core ideas that were acquired from the participants' responses. Findings derived from the study are thoroughly examined and supervised by the researchers, adviser, data analyst, research coordinator, and valuator.

| Theme | Core Ideas |
|---|---|
| Drastic Effect of Climate Change | Alteration of water flow patterns |
| | Determining the safety and success |
| | Inconsistent supply of fish |
| | Disruptions caused by typhoons |
| | Rising water levels |
| | Destruction to boats and livelihoods |
| Unpredictable And Inconsistent | Different weather |
| | Fish transfers area |
| | Leisure fishing |
| Fishing Condition Job Occupation | Weather conditions and needs |
| | Way of living |
| | Significant pressures due to climate change |
| Changing Patterns and Availability of Fish | Affected livelihood |
| | Caught without proper registration |
| | Rough sea conditions |
| | Decline in fish population |
| | Disregard fishing regulations |
| | Obstacles due to fuel and battery problems |

Table 1: Themes and Core Ideas of the Lived Experiences of Fishermen about the Climate Change in Panabo City.

Drastic Effect of Climate Change

Drastic effect of climate change clearly impacted the lives of the fishermen. The first theme represented the struggles of fishermen finding fish due to the effect of climate change. Participants generally agreed that the abundance of catching fish really depends on the weather.

It is further stated by the participant coded IDI_F5: "It has brought about a change especially in these times when our

climate is changing, in my fishing I used to catch a lot of fish, but now there are only a few because of that climate that it seems like sometimes the water in the sea becomes high due to heavy rain." (IDI_F5)

It is also supported by participant IDI_F2, who said that: "What we experienced here is really hard, because what we are selling is not yet known to everyone. You really need to make double effort ever day, until you can find a costumer to buy since we are not the only one here you need to convince

them to buy from you.” (IDI_F2)

The participant coded IDI_F6 shared his experience:

“Based on my experience, it is evident that climate change has had a significant impact on fishing. Each year, strong storms bring destruction to our boats and livelihoods, causing numerous fishermen to encounter accidents and endure a loss of income.” (IDI_F6)

Additionally, Participant IDI_F1 shared the Impacts of Plantation to their Livelihood:

“However, with the expansion of plantations in the fields, when it rains, the water flows through their channels towards the river and eventually the sea. Even the fish, which used to be able to sense the medicinal properties in the floodwaters, have moved away, causing a decline in fish population.” (IDI_F1)

Based on the response of the participants, most of them faced the drastic effect of climate change, which widely affected their livelihood. Initial reports from the Philippines’ Department of Agriculture say that small-scale fishermen were hit the hardest by the last typhoon. Tens of thousands of small boats and fishing gear were destroyed or damaged in the storm’s path, but larger commercial boats were less affected. According to Norris, et al. the effects of climate change, such as a rise in the temperature of the sea and the movement of its currents will bring about adjustments in the distribution of marine fish populations, with some locations benefiting from the change while others suffering from it.

Unpredictable and Inconsistent Fishing Condition

Unpredictable and inconsistent Fishing Condition. The fishermen struggled to catch fish due to different weather patterns.

Participant IDI_F1 Elaborated his Experience in Sailing:

“It depends on the weather conditions. If the weather is good, we go out to sea, but if the conditions are unfavourable, we refrain from venturing out.” (IDI_F1)

Participant IDI_F2 shared his Experience: “Sometimes, that’s true. Like in my case, the fish in the fish cages have moved farther away compared to before when they used to be much closer.” (IDI_F2)

Also, Participant IDI_F6 Complained about the Pressure of the Climate Change: “Fishermen are under a lot of pressure because of climate change. The ocean temperature

is rising, leading to increased fish migration. Because of this, a lot of effort is needed to catch fish.” (IDI_F6)

From the responses of the fishermen, there is unpredictable and inconsistent fishing condition going on due to climate change. The effects of climate change on the ocean environment have many different effects on fish populations, fisheries, and institutions that handle fisheries [8]. Since the beginning of the 20th century, the Earth’s temperature has been steadily rising. This is mostly due to human actions like burning fossil fuels and cutting down trees.

Changing Patterns and Availability of Fish

The third theme represents the availability of fish according to the weather patterns. Extreme weather events, like super typhoons with high winds and rising sea surface temperatures, can hurt coral reef habitats and the fish communities that depend on them.

It is stated by Participant IDI_F3: “Sometimes, you can get caught in a storm, and it can be challenging to endure the rough sea conditions. That’s why during those times, it’s best to quickly return home.” (IDI_F3)

Participant IDI_F5 added his Experience as: “Many fishermen do not follow fishing regulations, resulting in excessive and unsustainable fishing practices. The use of explosives and dynamite in fishing exploits our land and abuses our oceans, yet the government has not taken enough action to address this issue.” (IDI_F5)

Furthermore, Participant IDI_F6 shared his Struggles: “One major problem is the high cost of fuel for our motors. As fish stocks have declined, we need to venture farther into the sea. Many young fishermen rely on night fishing to catch more fish, but fuel and battery problems hinder us from continuing our fishing activities.” (IDI_F6)

Based on the participants’ response, changing patterns leads to different type of issues. Boucher O, et al. [14] stated that human actions and the effects of climate change put a lot of stress on the marine environment. This leads to changes in biodiversity and ecosystems, such as less food in the ocean, changes in how food webs work, and changes in where species live. Fishing is one of many human activities that has led to a decrease in species around the world. This raises concern about the role that biodiversity plays in keeping ecosystem benefits and, especially, climate change resilience [2].

| Themes | Core Ideas |
|--|---|
| Navigating Challenges of a Fishermen | Cultivating a mind-set of endurance |
| | Continue to endure and persevere |
| | Sea remains the primary source of income |
| | Promoting a sense of environmental responsibility and fostering collaboration |
| | Holistic perspective on environmental well-being |
| | Adhering to customs that prioritize environmental preservation |
| Strength and Sustainability | Commitment to provide for family |
| | Prioritizing family members |
| | Family is the primary motivation |
| | Well-being and survival of the family |
| | Continuous efforts everyday |
| | Putting great effort and hard work |
| Sustainable Fishing Practices and Conservation Effort | Limitations of the current situation |
| | Refraining from venturing out to sea |
| | Consistent effort and perseverance will eventually lead to success |
| | Adapting fishing practices to minimize harm to forests and coral reefs |
| | Incorporating deeper sea fishing as a method |
| | Deliberate choice to use traps and fishing gear |

Table 2: Coping Mechanisms Fishermen have Developed to Deal with the Changes in the Environment Themes Core Ideas.

Presented in Table 2 are the core ideas and themes generated from the participant's responses to the second objective which is how fishermen developed coping mechanisms to deal with the changes in the environment.

Navigating Challenges of a Fishermen

Navigating challenges of fishermen was the first theme developed. This theme emphasizes the difficulties fishermen encounter as they try to cope with the evolving conditions surrounding their livelihoods.

Tracing how fishermen deal with the issues and changes in the environment can help develop different mechanisms aligned to the issue.

Participant IDI_F1 Stated that: "It seems that we have no choice but to endure and rely solely on the sea for our livelihood since we don't have any other options." (IDI_F1)

Participant IDI_F3 Stated that: "The changes happening in our current times have had a significant impact, especially when there are no alternative livelihood options available. The sea remains our primary source of income." (IDI_F3)

Strength and Sustainability

The second theme represented the strength and sustainability of fishermen to be able to survive every

day. Despite their circumstances, they still find sources of income to fully provide for their family. The responses of the participants showed how positive they were even in their hard times.

Participant IDI_F3 shared: "First and foremost is the family because they are the ones who motivate you. If you don't know how to fish, you will make an effort to learn because, of course, you have a family to provide for." (IDI_F3)

Also, Participant IDI_F4 stated his Everyday Motivation as: "No one but my family, because if I don't strive, they will die because we don't have money for our needs especially for our daily food. Then if I don't work hard, my children won't be able to reach what they want in the future, and they won't be able to go to school." (IDI_F4)

Participant IDI_F6 Further Elaborated: "My family is the first reason why I try hard in my work give all my efforts no matter how hard I go through; I can endure for their benefit and to provide something for my daily needs. Because of my determination and discipline, I am able to provide a good life for myself and my family." (IDI_F6)

This dependence on the sea is evident from the participants' statements. Participants express that they have no other viable alternatives for earning a living. According to Kolding J, et al. [15], numerous individuals, communities, and countries continue to rely on fish and other aquatic

life for sustenance and raw materials. The sea is their only option, and they must endure the challenges it presents. The participants acknowledge that, despite the difficulties, they

have no choice but to persevere because they have no other means of support. Their motivation is to provide for their family members' needs to fully survive the day.

| Themes | Core Ideas |
|--|--|
| Navigating The Changing Tides | Noticeable decrease in fish population |
| | Potential of the sea |
| | Different types of fish have varying behaviours |
| | Adverse weather conditions |
| | Disruption of marine ecosystems |
| Changing Climatic Patterns Affecting Fish Migration And Abundance | Change in fish abundance |
| | Changed fishing grounds |
| | Decline in the availability of fish |
| | Illegal fishing activities |
| | Sea has become heavily polluted with garbage and plastic |
| | Adoption of modern technology |
| Evaluating Career Choice And Considering Alternatives | Limited job opportunities |
| | Income and expenses |
| | Diversification of income |
| | Skill utilization |
| | Limited educational qualifications |
| | Actively seek sideline jobs |
| Empowering Fishermen in the Face of Challenges | Collective determination and responsible actions |
| | Advocating against abusive practices |
| | Exploring different opportunities |
| | Responsible fishing practices |
| | Resilient local economy |
| | Avoid relying solely on fishing in one area |

Table 3: Insights and Hopes of Fishermen in Relation to Changes in Environment.

Navigating the Changing Tides

The first theme captures the essence of exploring the interconnected relationship between climate change and the fishing industry, taking into account the various insights gained about its impact. It focuses on understanding the challenges faced by fishermen and the broader fishing community in adapting to and mitigating the effects of climate change. As you read through their responses, you will notice how positive the respondents are. It was stated that climate change greatly affects the fishing industry due to its Changing weather conditions.

As Mentioned by Participants Coded IDI_F4 that: "Climate change greatly affects the fishing industry. Due to intensified

storms and rising sea levels, fishing becomes dangerous. Boats often get damaged, and the livelihoods of fishermen are greatly affected." (IDI_F4)

Further, the Participant Coded IDI_F5 Stated that: "Climate change causes significant damage to coral reefs, which serve as habitats for fish. The warming of the oceans leads to coral bleaching. As a result, fish lose their habitats, and their populations decrease. I also learned that no matter how difficult we are facing when we are fishing and no matter how hard to be a fisherman we still need to strive better and do more efforts." (IDI_F5)

Along with in the Statement of Participant Code IDI F_1 that: "You just have to keep trying, and you'll surely catch

fish because there are different types of fish. Sometimes they bite easily, while other times they don't. That's why we go out to the sea to fish and catch plenty." (IDI_F1)

Based on the participants, climate change brings a negative impact on the fishing industry and due to its rising weather conditions. According to Denise C, Climate change contributes to sea-level rise because ocean water expands as it warms and higher temperatures cause land-based ice, such as glaciers and ice sheets, to melt. It's against this backdrop of rising seas that changes to Earth's tides could have the most damaging effect. Climate change will affect coral reef ecosystems, through sea level rise, changes to the frequency and intensity of tropical storms, and altered ocean circulation patterns. When combined, all of these impacts dramatically alter ecosystem function, as well as the goods and services coral reef ecosystems provide to people around the globe. Yet, the participants still keep trying and do their best to navigate the changing weather conditions despite the negative effect of climate change [16-19].

Concluding Remarks

Based on the results of the study, fishermen depend on the life sea provides. Most of their source of income came from catching fish and other sea animals. However, climate change made a drastic impact on their livelihood. This situation tests their resourcefulness to find ways to supplement the needs of their families. They look for another job if the weather is not in a good condition. The sea was their only source of everything.

Three themes were generated on every objective of this study: For the first objective, the experiences faced by the fishermen are drastic effect of climate change, unpredictable and inconsistent fishing condition, and changing patterns and availability of fish. Most of them experienced the impact of climate change.

Further, for the second objective, the insights generated from the findings are navigating challenges of fishermen, strength and sustainability, and sustainable fishing practices and conservation effort. Despite the challenges climate change have brought to the lives of the fishermen, they did not lose hope, they continue to battle with the circumstances to be able to provide their family needs. Lastly, the insights generated on the last activity includes navigating the changing tides, changing climatic patterns affecting fish migration and abundance, evaluating career choice and considering alternatives, and empowering fishermen in the face of challenges. Facing those circumstances, fishermen never let the negative affect their living. They focused on what will be the outcome if they do not go and look for another type of living.

Implications

The findings of this study highlight the urgent need for increased environmental awareness among fishermen in Panabo City. Through the empirical exploration of their lived experiences, it has become evident that fishermen are witnesses to the adverse effects of climate change on their fishing activities. This research can serve as a wake-up call for policymakers and local communities to prioritize environmental conservation and climate change mitigation experiences shared by the fishermen, it is evident that climate change has significantly impacted their livelihoods and the availability of fish stocks.

This study recommends that the local government should take a proactive role in addressing the issues and challenges faced by fishermen due to climate change. This can be accomplished by providing financial assistance, resources, and training programs to help. In addition, it is recommended to enhance climate change education and awareness programs for the fishermen in Panabo City. This could be implemented through workshops, community discussions, and training sessions where the fishermen can learn about the impact of climate change on their livelihoods and the environment. This will empower them to adapt to the changing conditions and adopt sustainable fishing practices.

Further, given the increasing vulnerability of fishermen's livelihoods due to climate change, it is important to support and encourage the diversification of income sources. This could include promoting alternative livelihood options such as ecotourism, aquaculture, or other income-generating activities that are less dependent on weather patterns and fish abundance. Providing training and financial support to fishermen to engage in these alternative livelihoods can help reduce their vulnerability to climate change impacts.

Investments should be made in the development of climate-resilient infrastructure to support the fishing industry. This includes improving harbor and landing facilities, providing better storage and processing facilities, and enhancing disaster preparedness measures. Infrastructure development should take into account the projected impacts of climate change, such as sea-level rise and extreme weather events, to ensure long-term sustainability and resilience.

Additionally, encouraging collaboration between government agencies, local communities, and fishermen's associations is crucial for effective climate change adaptation strategies. Implementing a multi-stakeholder approach will ensure that the concerns and needs of the fishermen are considered in policy-making processes. This could be achieved through regular dialogues and coordination meetings where all relevant stakeholders can come together

to discuss and plan strategies for climate-resilient fisheries management. This study also suggests that future researchers use it as a starting point for those who want to investigate the same subject using a qualitative research design.

References

1. McLachlan JS, Hellmann JJ, Schwartz MW (2007) A Framework for Debate of Assisted Migration in an Era of Climate Change. *Conservation Biology* 21(2): 297-302.
2. Sutherland WJ, Atkinson PW, Broad S, Brown S, Clout MNP, et al. (2021) A 2021 horizon scan of emerging global biological conservation issues. *Trends in Ecology and Evolution* 36(1): 87-97.
3. Tewabe D (2014) Climate Change Challenges on Fisheries and Aquaculture. *International Journal of Aquaculture* 1(1): 006-011.
4. Santos MD, Dickson JO, Velasco PL (2011) Mitigating the impacts of climate change: Philippine fisheries in focus. *Secretariat, Southeast Asian Fisheries Development Center* 9(2): 101-110.
5. Oluowo J (2017) Impact of climate change on aquaculture and fisheries; A review. *International Journal of Multidisciplinary Research and Development* 4(1): 53-59.
6. Shobande OA (2021) Is climate change a monetary phenomenon? Evidence from time series analysis. *International Journal of Sustainable Development and World Ecology* 29(2): 99-111.
7. Robitzski D (2020) 60% of the world's fish species at risk of extinction due to climate change. *World Economic Forum*.
8. Mendenhall E, Hendrix C, Nyman E, Roberts PM, Hoopes JR, et al. (2020) Climate change increases the risk of fisheries conflict. *Marine Policy* 117: 103954.
9. Mumby PJ (2017) Trends and frontiers for the science and management of the oceans. *Current Biology* 27(11): 431-434.
10. Griffis E (2018) Oceans and marine resources. In: *Impacts, risks, and adaptation in the United States* (Edn.). Fourth National Climate Assessment 2: 1-38.
11. Suh D, Pomeroy R (2020) Projected Economic Impact of Climate Change on Marine Capture Fisheries in the Philippines. *Frontiers in Marine Science* 7(232): 1-14.
12. Klijn W (2022) Climate Change is a Social Issue Too. *Investment Innovation Institute*.
13. Bell RJ, Odell J, Kirchner G, Lomonico S (2020) Actions to Promote and Achieve Climate-Ready Fisheries: Summary of Current Practice 12(3): 166-190.
14. Boucher O, Forster PM, Gruber N, Ha-Duong M, Lawrence M, et al. (2013) Rethinking climate engineering categorization in the context of climate change mitigation and adaptation. *Wiley Interdisciplinary Reviews: Climate Change* 5(1): 23-35.
15. Kolding J, van Zwieten PAM (2014) Sustainable fishing of inland waters. *Journal of Limnology* 73(s1): 132-148.
16. Costanza R, De Groot R, Kubiszewski I, Sutton PC, Farber S, et al. (2017) Twenty years of ecosystem services: How far have we come and how far do we still need to go. *Ecosystem Services* 28: 1-16.
17. Liu J, Borazon EQ, Munoz KE (2021) Critical problems associated with climate change: a systematic review and meta-analysis of Philippine fisheries research. *Environmental Science and Pollution Research* 28(36): 49425-49433.
18. Morais RA, Depczynski M, Fulton CJ, Marnane M, Narvaez P, et al. (2020) Severe coral loss shifts energetic dynamics on a coral reef. *Functional Ecology* 34(7): 1507-1518.
19. Food and Agriculture Organization of the United Nations (2016) *The State of World Fisheries and Aquaculture: Contributing to Food Security and Nutrition for all*. Food & Agriculture Org, pp: 1-205.