Developing Livelihood Resilience through Adaptive Strategies and Government Interventions during the COVID-19 Pandemic: A Case Study on the Small-Scale Fishermen in Tacloban City, Philippines

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ABSTRACT. With the onset of the pandemic, small-scale fishermen (SSF) in the country have become even more vulnerable to multiple adverse stressors. It is important to remember that fisher households have minimal assets, and their ability to mitigate the effects of crises and shocks is restricted. This study aims to enhance our understanding of livelihoods by using the idea of resilience as an analytical tool in examining the different aspects of fisherfolks' adaptive systems during the pandemic and the role of the government in bolstering their livelihood resiliency. This qualitative study utilized a multimethod case study design, and for the data analysis, I utilized Clarke and Braun's six phases of thematic analysis. Four major themes were uncovered in the study: assets and livelihood resiliency; livelihood challenges and stressors in the pandemic; SSF with adaptive strategies vs. without adaptive strategies; and Government's role in SSF livelihood resiliency. The study produced findings on resiliency and adaptive strategies pertaining to livelihoods in the context of a pandemic. The study found that SSF who diversified during the pandemic were more robust in their livelihood than SSF who did not have any adaptation techniques applied during the pandemic.

1.0. Introduction

Food, clothing, housing, and social interactions are a few of the many resources a person has. The ability to provide for these and other basic necessities hugely depend on a person's financial or property resources. People's resources and means of life are components of a sustainable livelihood. A sustainable lifestyle can cope with and recover from stressful situations and sufficiently supply subsequent generations. Meanwhile, an economically sustainable livelihood preserves and improves the resources that livelihoods depend on while also being helpful to other livelihoods. As a result, sustainable livelihood is characterized as the capacity and means to meet the fundamental requirements of a population in a resilient manner (Chambers & Conway, 1992; Gaillard et al., 2009; Giger et al., 2022; Pangali Sharma et al., 2022). Ensuring self-sufficiency and livelihood strategies may safeguard both individuals and families. People's allocation of assets and selection of business activities to attain their livelihood objectives is referred to as their livelihood strategy. Actions undertaken by residents to meet their financial needs can be fluid and continually refined to reflect policy changes, new systems, changes in the environment, and personal money that can be allocated for various endeavors. For example, when rural inhabitants are exposed to or affected by natural catastrophes, hunger, or environmental degradation, they frequently alter their livelihood methods in accordance with their capital and capabilities (Zhou et al., 2021). The Brundtland Commission on Environment and Development first popularized the notion of sustainable livelihoods, presenting it as a significant component of the poverty eradication strategy (Krantz, 2001). In the end, several development organizations have used the sustainable livelihood method, such as the United Nations Development Program, the United Kingdom's Department for International Development, Oxfam, and other similar organizations (Adato & Meinzen-Dick, 2002). The method focuses on decreasing poverty by supporting the poor in creating and making their own opportunities by providing them with access to assets, assisting

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them in developing, etc. The concept also states that livelihoods should be considered in terms of residents' access to capital assets, which include financial, natural, physical, social, and human assets, among other things. People should fuse or combine these assets to improve their living conditions and extend their asset base through interaction with other institutions and actors (Chambers, 1995; DFID, 1999; Johansson, 2015; Scoones, 1998). The five capitals/assets necessary for sustainable living are located at the heart of the approach: physical, natural, human, financial, and social capital assets.

Rural and coastal families experience problems in their livelihoods due to fluctuations in resource richness, seasonal cycles of resource usage, and variations in access. These variables are further exacerbated by economic and policy factors, which compound the problem. Consequently, in reaction to these stressors and shocks, individuals innately look for or create alternative approaches to mitigate these (Marschke & Berkes, 2006). Small-scale fishermen (SSF) with hardened livelihood conditions almost always come parallel to the nature and extent of existing or 'ad hoc' government intervention programs, thus affecting the degree of people's resiliency and survival. Understanding the association of livelihood conditions and available intervention programs to SSF resiliency and survival can contribute to social inclusion discourse.

Due to the COVID-19 pandemic and subsequent lockdowns, several countries are experiencing more poverty and illness (Love et al., 2021; Sumner et al., 2020). With the onset of the pandemic, small-scale fishing households in the country have become even more vulnerable. It is important to remember that fisher households have minimal assets, and their ability to mitigate the effects of crises and shocks is thus restricted (Ferrer et al., 2021). Many are now seeing the widespread impacts COVID-19 has on the SSF industry (Bennett et al., 2020). Throughout this fishing industry, impact and reaction happen haphazardly. Implementing a strategy to protect SSF against shocks, respond, and restore their normal functioning is essential (Love et al., 2021).

Reminiscing Typhoon Yolanda, the disaster caused losses in income and employment. Also, it even caused a disturbance in markets supply value chains and markets, affecting various livelihoods (Berja, 2019; Mangada, 2016). According to Kahambing (2020), "the coronavirus disease 2019 (COVID-19) is a disaster that merits vulnerability." An excellent approach to see this is to focus on an individual's and household's sensitivity and exposure to many stressors, which increases during pandemics due to their socioeconomic situation. Vulnerability is natural, arising from several sources that reinforce one other. There are countless socioeconomic impacts brought by the pandemic that is similar to that of a natural disaster. As the pandemic persists and different challenges are experienced by the fishing industry, specifically by small-scale fishers, the research gap this study intends to address is the lack of in-depth research on the SSF livelihood situation in the Philippines during the pandemic.

This study aims to enhance our understanding of livelihoods by using the idea of resilience as an analytical tool in examining the different aspects of fisherfolks' adaptive systems during the pandemic and the role of the government in bolstering their livelihood resiliency. I am interested in learning more about the practical applications of resilience thinking and how people cope with problems. The study's findings will be of value to government agencies, non-governmental organizations, and fisherfolks so that SSF's overall well-being be strengthened, and interventions can be further reinforced. The objectives of the study are: (1) understand the livelihood resilience of small-scale fishermen (SSF) in Tacloban City during the COVID-19 pandemic; (2) know the challenges SSF experienced, how they adapted to the identified challenges, and the city government's policies and interventions that strengthen the livelihood resilience of SSF.

2.0. Methodology

Research Design. The research subscribed to a qualitative research design, concentrating on an individual's viewpoint on situations, processes, interactions, etc. (Rebolj, 2013). A multi-method case study approach was applied in the study by combining various qualitative methods to study the social environment's diversity and contingency (Moran-Ellis et al., 2006). It is feasible that differing qualitative approaches, all conducted using the same epistemological perspective, resulted in better research quality. As pointed out by Esterberg (2002), "research designs that include multiple research strategies [as] the strongest ones", since an extensive range of techniques is administered in multi-method qualitative research (Mik-Meyer, 2020).

Sampling and Participants of the Study. To participate in the study, participants should have been engaged in fishing activities for ten years

and living in Anibong and San Jose, Tacloban City. Twenty respondents participated in the study, composed of 2 key informant interviews from the City Agriculturist's Office and 18 small-scale fishermen.

A purposeful sampling technique was used in this study, wherein a researcher locates and chooses individuals or groups who experienced a specific phenomenon in this process (Creswell & Plano Clark, 2011; Palinkas et al., 2015; Patton, 2002). To diminish selection bias, I interviewed respondents and studied cases of using certain strategies, picking respondents who present certain adaptive strategies and those who do not adopt any.

Data collection techniques and procedures. Information and data for this study were gathered through in-depth interviews and observation (Larkin & Flowers, 2021; Moreno & Ballena, 2021). The data collection was done using a semi-structured interview which elicited significant experiences and stories. The interviews were conducted in the communities of the participants. The interviews took forty to fifty minutes, and the participants were informed beforehand that these were the average interview duration based on the pilot testing of the study's interview guide. A Digital Voice Recorder was utilized to record participants' interviews and KIIs. Repeated data collection was made until a sufficient amount of information had been gathered or "data saturation" was achieved (Moreno & Ballena, 2021).

Analysis of Data. This study utilized a thematic analysis. This analysis approach is significant to this study because it works with various types of data, handles both large and small data sets, and produces data and theory-driven analytics. Thematic analysis has six significant phases: "(1) familiarization with the data, (2) coding, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) writing up" (Braun & Clarke, 2006; Clarke & Braun, 2013). The Nvivo software helped confirm the research's existing codes and provided new ones. I was assisted by the University of San Jose-Recoletos' Center for Policy, Research, and Development Studies for data analysis.

Trustworthiness of the Study. When undertaking and analyzing qualitative research, it is believed that trustworthiness should be observed. To ensure that the process is trustworthy, the study should meet four requirements: credibility, transferability,

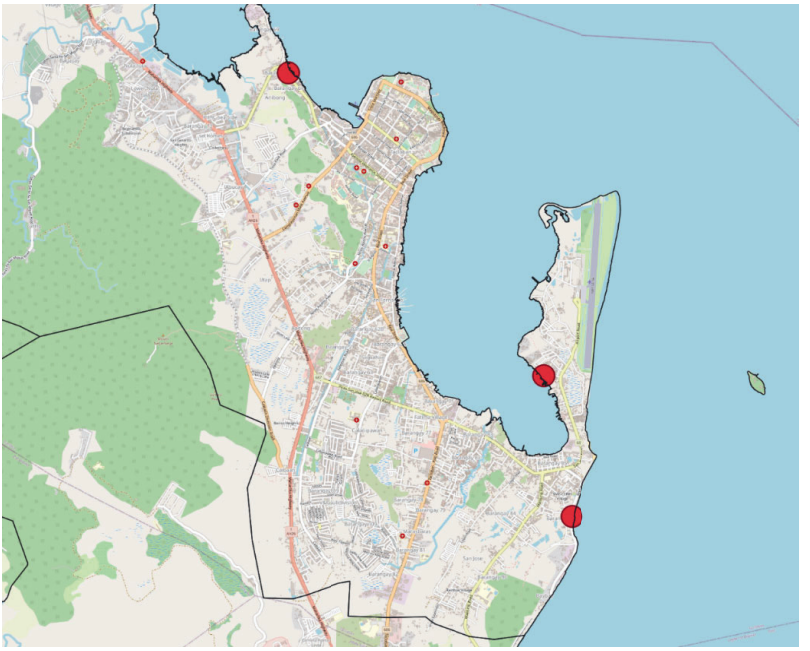

Figure 1. Map of Tacloban
Source: Google Maps. Tacloban City. Retrieved October 30, 2022, from https://www.google.com/maps/@11.2184696,125.0027494,13.4z

dependability, and confirmability (Guba & Lincoln, 1989; Maher et al., 2018). The following requirements were thoroughly followed during the study. Moreover, the triangulation of interview and observational data helped verify the results. To raise the credibility of the proven patterns and themes, the triangulation approach was used to ensure that results remain reliable (Moreno & Ballena, 2021; Patton, 2014). Concerns relating to methodology and sample, judgments regarding coding and analysis, obstacles faced throughout the research, and personal thoughts on the project were documented through concept memo writing (Charmaz, 2014; Peters & Wester, 2007; Tracy, 2010).

Following research ethics, informed consent was presented to the participants prior to the research interview. I made it clear in the instructions for the permission form that participants have the option of declining to participate in the study (Creswell, 2014). Also, throughout the study's implementation and publication, the participants were notified that identities would be kept strictly confidential, in which pseudonyms were used to conceal their real names (Moreno & Ballena, 2021). In addition, proper protocols such as checking local regulations before engaging with the community, wearing masks during interviews, observing social distancing, and choosing outdoor venues rather than indoor settings (World Health Organization, 2020).

3.0. Results

Assets and livelihood resiliency

The theme highlights the relationship between assets and livelihood resiliency. Identifying assets gives an overall understanding of the livelihood resilience of small-scale fishermen (SSF) in Tacloban City during the pandemic, considering that assets are necessary for a sustainable and resilient livelihood. The method is centered on the five capital assets required for sustainable living: natural, human, physical, social, and financial capital assets.

The participants were explicitly inquired about their physical and financial capitals like road accessibility, accessibility to hospitals, and fishing equipment. Human capital, like health problems that they experience, may impact their ability to practice their livelihood. SSF social capital was likewise explored, focusing on the significance of familial and neighborhood support. Lastly, I also queried about their natural assets. This asset underlines natural accessibility and issues such as encroachment, environmental problems, etc. The research participants were also asked about their family's present living conditions compared to their neighbors during this pandemic. Most of the participants mentioned that they have more difficult living conditions than their neighbors. Some even pointed out that it is hard to distinguish whose conditions are much worse since even my neighbors, who are also fishermen, are having a rough time during the pandemic.

> "With this pandemic, we all are basically struggling. Both in health and financial terms, we are finding means to go by each day and find something to eat." (Rosario, personal communication, March 15, 2022)

SSF who were relocated to the resettlement areas indicated that the distant location of the resettlement areas affected their livelihood.

> "Naukoy na kami yana ha pabahay, sir. Nagkukuri nagud kami hin duro kay maaram kaman nga it amon pakabuhi adi ha dagat. Makakayakan gud ako nga nagkukuri ako." [We are now living in the pabahay/resettlement site, sir. We all are having a hard time there because our livelihood is here (in the sea). I can say we all are having a hard time.] (Sonia, personal communication, March 15, 2022)

This theme likewise explains human assets/capital and how it relates to the livelihood resiliency of SSF. The respondents were queried about the general health of their families. They were also asked about the severe sickness experienced/suffered during the pandemic that affected their livelihood. Only a few expressed that no severe illnesses were encountered during the pandemic. Sammy, Rosario, and Maria mentioned having a healthy condition, only catching mild sicknesses like coughs and colds. Kian further added that

> "in general, our family's health is okay. After I caught a high fever last month, we started drinking vitamins." (Kian, personal communication, March 15, 2022)

Regarding health problems impacting SSF's ability to fish or do other activities, accessibility to medicines is a significant concern for healthcare in general.

Familial and neighborhood relations are substantially vital for SSF because these groups aid and check on one another for survival despite the brutal impacts of typhoons and the pandemic. The respondents mentioned how families and relatives support them in their everyday work. Clearly, this group serves as a building block to increase or maintain SSF livelihood resiliency. All respondents agreed on the substantial role family, relatives, and neighbors play in their livelihood. Additionally, when questioned about the nature of access to their docking areas, they all stated that the accessibility of their docking areas is of shared/common ownership.

The respondents mentioned that fishing as a livelihood does not guarantee an enhanced financial situation. They also indicated that they own their fishing equipment. As noted by Rosario,

> "Our fishing equipment is owned; we have our own boat. It really is important to have your own equipment because it makes the work easier." (Rosario, personal communication, March 15, 2022)

Despite the ownership of fishing equipment, this does not assure that it will increase their livelihood resiliency due to ponderous challenges and stressors such as the expensive maintenance of fishing boats, equipment, transportation fare, etc. Most of them (12 out of 18) specified that they do not have bank accounts, and only a few of the SSF (6 out of 18) said that they have family member/s that have salaried jobs. In addition, 18 out of 18 participants claimed that their household had not received any remittances locally or internationally. People who lack financial resources are more susceptible to environmental and other calamities, particularly those caused by climate change. In line with environmental issues, the research participants were asked, "what environmental problems do you observe that affect your livelihood?" Most of their answers include typhoons, red tide, and climate change.

Livelihood challenges and stressors in the pandemic

The theme focuses on the major stressors and challenges SSF faced during the pandemic. This includes issues maintaining SSF encountered, precisely the difficulty of maintaining a resilient livelihood. Questions on the challenges and stressors were asked to aid and augment my understanding and awareness of the current situation of SSF. All participants (18 out of 18) mentioned that they were facing severe problems that dramatically affected the sustainability of their livelihood during the pandemic.

In connection to mobility, Kian, a 42-year-old fisher, mentioned transportation as a significant obstacle during the pandemic. Since transportation rates increased, his earnings were sometimes consumed mainly by taking numerous trips from his home to the fishing areas. There was also a time that he got stressed and hopeless when his fishing equipment was destroyed. Mario, a 67-year-old fisherman, likewise mentioned mobility and health as major issues. Most of the time, *barangay* police officers (locally known as "tanods") and the sea patrol would disallow fishing during lockdowns during this pandemic. Jerson, who has been fishing for 20 years, stated that their fishing nets and other fishing equipment were poached. He further added that this kind of issue increased during the pandemic. He also pointed out another challenge: the increasing local demand for imported fish because of its low price compared to local products. Michael, a 25-year-old fisherman, also stressed the increasing occurrences of theft of fishing equipment in the Burayan (San Jose) fishing areas.

> *"Mayda mga nangangawat gud hin isda hini dinhi. Ma pausa ka nagud la kun kay ano waray sulod it imo pukot bisan usa ka isda. Danay pati iton imo pukot ginkakawat gihapon. Nakabati na ak hin damo nga storya didi ha amon lugar parte hiton mga pangawat."* [Sometimes, some people steal your fish; you will be shocked why your net did not catch any fish because I only leave my net there. Sometimes they also get your fishing nets. Actually, there are stories from other fisherfolks where someone actually gets their fishing nets and fish.] (Michael, personal communication, March 8, 2022)

Fisherfolks Ramil and Sonia discussed how gasoline price hikes substantially and negatively impact their livelihood. Both respondents live in the resettlement area, which is situated away from the fishing docks and areas. Ramil mentioned that despite the costs, he has no choice but to still go to work since there are no feasible jobs in the resettlement areas.

The unexpected rise in the number of fishermen during this pandemic had a socioeconomic impact on fishers who were already fishing

prior to the pandemic. This circumstance is not entirely problematic since numerous individuals lost their jobs during the pandemic, resulting in occupation shifting. However, the abrupt change has implications for pre-pandemic fishers, such as the growing competition of small-scale fishers. Just during this pandemic, some fishers from other localities like the Samar islands would come to our fishing areas just to catch. This reflects that Filipino citizens had little to no livelihood support during the pandemic.

> *"Makuri yana nga pandemic tungod nga dumamo an mga parangisda. Guti la kami nga parangisda dati. Mayda na ngani na dayo para la mangisda didi, sugad mga taga Samar."* [Livelihood is difficult during the pandemic because of the increase of fishers. Unlike before that, there were only a few of us catching fish. Some of the fishers in our areas are not even from here. Some of them came from Samar.] (Bienvenido, personal communication, March 15, 2022)

> *"Mahintungod nga nagtikadamo na an parapangisda, makuri na makadakop hin damo nga isda, di sugad han una."* [Since there is an increase of fishermen, it's really hard to gain a huge amount of catch.] (Orlando, personal communication, March 8, 2022)

SSF with adaptive strategies vs. without adaptive strategies

The third theme underscores the different adaptive mechanisms performed by SSF. Research participants were questioned if they had other livelihood/s and diversified to other jobs during the pandemic. Some participants (9 out of 18) pointed out that they must diversify to cater to their families' needs. A decision that may be difficult for most SSF since they have been working as fishermen for several years already. Rolly and Angelino had to diversify during the pandemic because of health problems. In relation to their available assets, these SSF were capable of temporarily shifting their livelihood to earn income.

In this study, there are SSF who were practicing negative adaptive strategies just to survive the pandemic, which limits the livelihood resiliency of these individuals. Furthermore, coping techniques might be resilient depending on available resources and technologies. For instance, Angelino used his financial and physical assets to acquire a freezer to start his ice-selling business. Other participants mentioned other strategies that they started during the pandemic.

The respondents were further queried if these strategies enhance their quality of life and if these strategies can be improved. All respondents with adaptive systems agree that it helps boost their quality of life. Some did not provide detailed explanations, but they firmly believed it helped them survive during the pandemic. Conversely, some mentioned how their strategies helped their lives during the pandemic. That being said, the adaptive capacities SSF have highly relies on the possession or accessibility of capitals. Both SSF with and SSF without adaptive strategies were significantly similar in terms of their human, social and natural assets. Most SSF, when inquired about their highest educational attainment, only finished high school. All of them mentioned having good health conditions during the pandemic, but there is still an ongoing issue of availability and accessibility of medicines faced by SSF. The presence of their familial and non-familial linkages aids them in maintaining a degree of livelihood resiliency through familial care (sharing of food, money, etc.) and livelihood support (lending fishing equipment, helping in carrying boats to their docking area, etc.). Concurrently, SSF with and without adaptive strategies considerably differ regarding their financial and physical assets. SSF, who diversified their livelihood, were able to subdue the impact of the pandemic. There was even a degree of enhancement of SSF assets due to the accumulation of resources such as business equipment (cart, freezer, online shop, etc.).

Government's role in SSF livelihood resiliency

Discussion on the different challenges that hinder SSF from having a resilient livelihood earlier; meanwhile, this theme focuses on ways or strategies to make challenges easier for fishers through government facilitation. Respondents were asked about the challenges they are currently facing, whether they can permanently hinder/affect their livelihood, and whether these challenges can still be changed or overcome. Respondents primarily mentioned the government's significant role in overcoming their experienced stressors and challenges. Jerson emphasized the expensive transportation costs, medicine accessibility issues, and the ongoing stealing of fishing equipment, as presented in the previous theme. He responded,

> "I think the problem I mentioned earlier can still be solved; however, it would require help from the national and local governments." (Jerson, personal communication, March 20, 2022)

SSF were finally asked about their recommendations/suggestions to the local and national governments to better support local fishermen in our region. The answers of the SSF mainly revolved around gaining food and financial support and fishing equipment that was destroyed during the recent typhoon. Other SSF suggested that national and local governments should help them start their own business to diversify, through the provision of capital. They are also willing to undergo any training to prepare them to create their businesses. Sammy recommended that

> "I hope that the government capacitates SSF. The government should teach SSF other ways to earn money during the pandemic. They should conduct pieces of training or give them capital to start their own business. But of course, it should be properly monitored so that their proposed businesses will not fail." (Sammy, personal communication, March 15, 2022)

Another participant who implied business capital as a strong recommendation came from Bienvenido, who said,

> "I hope they will give me the capital to start my own store and dried fish farming. Since I am already old, fishing is heavy work for me; that is why I hope that we are given the capital to start my business." (Bienvenido, personal communication, March 15, 2022)

Apart from fishing equipment, another area of concern is the healthcare support of SSF. As argued in the previous theme, the general health and well-being of SSF are also significant in attaining livelihood resiliency. Jerson specified that

> "There should always be help concerning fishing equipment. I hope that equipment can easily be provided for us, especially for cases like fishers who got their nets lost/stolen. Also, on the health aspect, I hope that local health centers provide medicines for us fishermen since we are also prone to sickness such as fever." (Jerson, personal communication, March 20, 2022)

Some participants remarked that they were willing to start a fish cage business. Gilbert recommended that "before, we were given a chance to manage fish cages. However, per cage, there will be 25 fishers. That is a lot of fishers for one cage. It would be better if there were only two fishers per cage." Gilbert clearly pointed out the low possible personal income if the total earnings were split among 25 SSF. The response of Angelino further underpinned this. He stated that

> "Fishermen like us need help from time to time, especially since during lockdowns, it is hard for us to gain income. How can we buy basic necessities if we do not have money right? That is why there should be more food, financial, and medical support for us individuals. Department of Agriculture also promised us that we would be given fish cages. I hope that the number of cages will be increased because if there are only a few cages, the income will not be enough to sustain all of the members of our fishing organization." (Angelino, personal communication, March 20, 2022)

Barangay officials were also asked about their recommendations and how government interventions could be improved in connection with fish cages. According to a *barangay* official from Anibong,

> "I think it would be best to select fishermen who are more willing to focus on growing cultured Bangus in fish cages. Also, there should be more unity and initiative among fishers and more monthly meetings. To take care of the fish cages, it would be best to create a schedule to assign individuals to look after the cages every week. Another intervention would be giving capital for these fishermen to start their own business (sari-sari store, pedicab, etc.)." (San Jose Barangay Councilor, personal communication, March 8, 2022)

The informant from the City Agriculturist Office also had the same idea. The city government should be progressive and innovative with the

introduction of fish cages, considering the fair annual production. According to the informant,

> "for the fish cages to be sustainable, it should be a complete package. What I mean is that the technology and equipment should be comprehensive and complete. There should always be enough resources to be handed out to these fisherfolks. So that project will be sustainable. There should be a cage, fishes, feeds, etc. Monitoring is an integral aspect of the program. The concerned office should not neglect these fishermen. They should monitor everything from stocking, harvesting, and marketing. The concerned office should guide them so that the program will be sustainable. Based on our observation, fish cages have a higher net income over capture fisheries. There should be a shift in aquaculture and production because capture fisheries alone are not enough and sufficient in terms of revenue. That's why it would be best if fisherfolks were given their fish cages." (City Agriculture Officer, personal communication, March 21, 2022)

4.0. Discussion

The multimethod case study contextualized the livelihood resilience of small-scale fishermen during the pandemic. Their narratives and experiences express that those assets are significant components of achieving resilient livelihoods. Major challenges and stressors affected their livelihoods during the pandemic; hence, adaptive strategies were employed by SSF, and the city government has a critical role in strengthening their livelihood resilience.

According to Rakodi (1999), these assets consist of a stock that may be acquired, held, assigned, or transferred to activities that provide livelihoods and other sources of revenue. Accessibility to essential utilities and infrastructure, such as irrigation and roads, is referred to as "physical capital" (Adato & Meinzen-Dick, 2002). If services such as affordable transportation are lacking, there is undoubtedly a high tendency for physical capital to abate. Human capital covers a person's or family's health, skills, education, knowledge, and capacity to work (Tacoli, 1999). To make the most of natural, physical, and financial assets, it is vital to have a certain degree of social capital. People's assets are more than just a source of income; they also provide a sense of purpose and meaning to their lives. They empower individuals to be and do what they want. The field of social resources, such as networks, organizations, associations, and relationships based on mutual trust, solidarity, and trade, is included in the concept of social capital (Adger, 2003; Bebbington, 1999; Jacobs et al., 2015). SSF should have financial capital, including savings, credit, inflows/outflows of payments, and remittances (Campbell et al., 2002; Erenstein et al., 2010). Likewise, natural capital involves access to environmental resources and services such as soil, water, air, forest resources, agricultural land, and grazing lands (Campbell et al., 2002; Erenstein et al., 2010). Hence, increasing financial capital via fishing may consequently minimize environmental and other calamities in a wide geographic range (Agrawal & Perrin, 2008).

Environmental catastrophes largely disturb all assets SSF possess. Strong typhoons can displace them and potentially affect their mental health. The consequences of climate change on the coastal environments will continue to influence fisheries, particularly in regions where the conditions are ideal for the phenomenon to occur. The coastal populations and natural systems will be severely impacted due to this. Some recent researches have given evidence of how climate change affects fish populations and aquaculture production and the detrimental effects on coral reefs, including coral bleaching and changing species diversity and composition (Muhala et al., 2021).

As I pointed out in the research problem, because of the pandemic, the small-scale fishing market now confronts even greater obstacles and risks. Small-scale fishermen are particularly vulnerable to the virus's hazards since they rely on their daily catch to feed and support their families (O'Neill et al., 2019). In the Philippines, municipal or small-scale fisheries play a key role in coastal communities and the country's livelihoods and food security. Many small-scale fisheries (SSF) have been affected by the COVID-19 shutdown, which has led to the closure of fishing activities and shuttered market stalls that disrupt food security (Macusi et al., 2022).

Industries such as fisheries were hit hard by higher transportation and logistics expenses and delays because of lockdowns (Orlowski, 2020). Because SSF could not leave their houses or engage in any other activities during the lockdown's early stages, for instance, non-essential personnel were not permitted to leave their homes or engage in any other activities.

From February to May 2020, fishermen faced a particularly difficult time. With each day that passed, they were more concerned about providing for their families. Food deficiency was caused by a lack of movement. Due to the disruption in the food supply chain caused by the pandemic, food costs rose dramatically (FAO, 2021; Lopez-Ercilla et al., 2021; Macusi et al., 2022; Workie et al., 2020). According to Siguan (2021), poor living circumstances negatively impact a person's quality of life. Families' anguish is exacerbated by transportation, sanitation and health, and security concerns, as well as the perception that they have been displaced from their principal source of income, which is fishing. As of September 2020, a projected 23.7 million people were unemployed, following a record high of 45.5 percent in July. This represents over half of the adult labor force in the country. As a response, some viewed fishing as a short-term revenue source. Locally Stranded Individuals (LSIs) turned to fishing as the virus rose, wherein most of these individuals were affected by mass layoffs brought about by the pandemic (Conde, 2020).

According to Holling (1973), resilience thinking refers to a system's capacity to bounce back and recover after being subjected to disruptions or stress. It first gained popularity in ecology, and over 40 years, it has become widely utilized in a variety of disciplines, including climate change adaptation, engineering, and catastrophe risk reduction, among others (Carpenter et al., 2001; Fath et al., 2015; Leslie & Mccabe, 2013). According to Tanner et al. (2015; 23), a person's ability to maintain and increase their standard of living in the face of such external stressors is called livelihood resilience. It is significant to note that such stressors can be diminished through adaptive coping strategies to attain a better quality of life (Oleś, 2015; Padios et al., 2022). When a system is resilient, it can absorb disruptions without altering its structure or function while retaining development choices in the face of such changes. When used in this way, adaptive capacity and adaptation are the tools and methods required to keep a system operating properly while also affecting its overall resilience (Pagnani et al., 2021). From an ecological lens, adaptation is the process through which socio-ecological systems adjust to the current and anticipated consequences of human-caused climate change. According to the goals and processes involved in adaptation, it can be short- or long-term in duration (Asante et al., 2021).

According to Coulthard (2012), there are three possible adaptation options for fishers encountering difficult decision-making situations. These strategies are "exit fisheries, livelihood diversification, or remain fishing." Every individual is thought of based on agency, interpersonal influence, and social institutions. Inequality cannot be reduced, or resilience increased by using negative coping techniques to absorb shocks. It is impossible to enhance the lives of individuals and communities by using negative techniques. It is not a good idea to cut back on nutrition, live in bad housing with poor sanitation, accumulate debt, use child labor, or work for one's own account. That both survivors and governmental/non-governmental organizations might carelessly associate negative coping strategies with good notions of resilience is particularly concerning (Eadie, 2019). Livelihood resiliency can still be achieved despite diminishing health assets due to sickness. It depends on how individuals adjust their other available resources. Coping techniques might be resilient depending on the resources and technologies available (Adger, 2003; Senbeta & Olsson, 2009). The quality of life encompasses all aspects of a person's existence, including their circumstances and the resources and conditions that society provides. The term "adaptation" encompasses a wide range of mechanisms and processes that, depending on the situation, might have varying consequences on health and well-being (Fischer, 2014; Sieber, 2018; Teschl & Comim, 2005).

There is a strong connection between financial and natural capital because natural capital may be used to generate financial capital. Adaptability and well-being depend on a household's ability to balance these five capitals. A minimum degree of human and social capital, for example, is required if natural, physical, and financial capital are to be utilized efficiently. People's assets are more than just a way to earn a livelihood; they also serve as a source of meaning in the person's life. They empower individuals to be and do what they want. In terms of the study's theoretical framework, which is livelihood resilience, the five capital assets are both inputs and outputs of the livelihood system (Bebbington, 1999; Jacobs et al., 2015).

According to Van Breda (2018), resiliency is a process that results in an outcome brought by adversities. The theory's primary concern is with the intermediary processes. Social systems that guarantee positive outcomes when faced with adversity are said to be "resilient." To better

understand resilience, these three elements should be considered: "adversity, mediating processes, and positive outcomes." The concept of resiliency is described as a "multilevel" process that systems employ to help individuals rise to the occasion of adversities. It means that resilience processes occur at multiple layers of the businesses) to handle several demands – reacting to the health crisis, minimizing sectoral shock, and ensuring the food system operates smoothly – while still pursuing critical long-term objectives connected to maintaining and protecting marine ecosystems and resources (OECD, 2020).

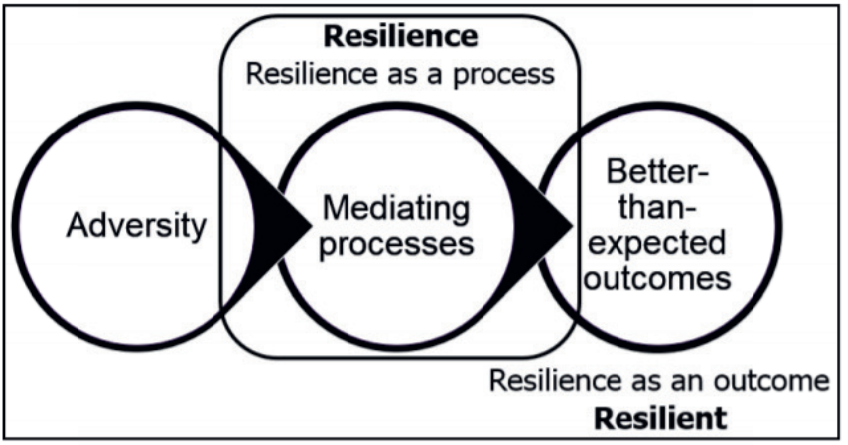

Figure 2.Resilience as Process and Outcome. Adapted from Van Breda (2018)

social ecology, not just in the individual. Family networks and the community are significant aspects of it. In essence, the community may refer to any complex sociocultural setting, including state and non-state institutions.

Considering the results of the study, the Resilience as Process and Outcome framework provides a point of analysis on the livelihood resilience of SSF. This explains why the COVID-19 pandemic is adversity, and the mediating processes are the SSF assets, together with government institutions and policies, to rectify the unquestionably deteriorating conditions and vulnerability. Also, this framework facilitated the determination if SSF livelihood can be called resilient or not (Van Breda, 2018).

The COVID-19 pandemic significantly impacted all elements of the fish supply chain, jeopardizing employment, revenue, and food security. Government and business solutions are required to alleviate the immediate economic and social challenges being experienced by the seafood sector as a result of the crisis. Additionally, governments must maintain long-term goals for the protection of natural resources and ecosystems, as well as the viability of fisheries. Risks to employment, incomes, and food security, therefore, need governments (and

5.0. Conclusion

Natural, human, physical, social, and financial capitals are significant components in understanding the livelihood resiliency of SSF. Most SSF possess an adequate level of social capital but lack access to other assets. The study found that having numerous stressors and insufficient livelihood opportunities and capabilities negatively impacts the livelihood resiliency of SSF. The study produced findings on resiliency and adaptive strategies pertaining to livelihoods in the context of a pandemic. Moreover, SSF who diversified during the pandemic were more robust in their livelihood than SSF who did not have any adaptation techniques applied during the pandemic. I analyzed the issue at an overview level to draw linkages on how governmental institutions and players in those areas impact SSF livelihood resiliency. That being said, the role of the government is pivotal in the process and outcome of SSF livelihood resiliency.

Livelihood resiliency as the theoretical framework of the study confirms the study's findings, in which mediating mechanisms, such as the adaptive strategies of SSF, were able to support and achieve positive outcomes in the face of adversity. This study also links with my

recent publication in Oxford's *Journal of Public Health*, which discussed the narratives of Typhoon Yolanda (Haiyan) victims in the pandemic, wherein most informants for the correspondence were fisherfolks. Based on an emerging and changing contextual issue, this study gave new ideas and outlooks to this burgeoning research topic nationwide and in Leyte.

6.0. Limitations of the Study

This study's design was limited by time and financial resources, although more participants could have provided more helpful information for the study. The methodology and data analysis lack quantitative approaches (such as calculating the poverty index, asset index, or vulnerability scores) to further solidify the study's generalizability. The study has only undergone relatively basic analysis techniques connected to the researcher's limited financial resources. Additionally, the research involved three fishing communities only, which means it did not present the livelihood conditions of other fishing communities in the city.

7.0. Future Research

In the light of the findings and conclusions, I suggest the following to future researchers: conduct the same study that encapsulates both qualitative and quantitative approaches so that the study can have a generalizable and in-depth discussion on the issue and identify all existing adaptive strategies of SSF during the pandemic; to limit mismatch, there should be a needs assessment of SSF and to capture who are willing to start with the diversification of their livelihoods; and to capture and discover the specific challenges and adaptation strategies of SSF by replicating the study in other local communities.

8.0. Competing Interests

The author has no competing interests to declare.

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